

Central Heating Cost Comparison

A cost comparison of installing a gas central heating system compared to installing a Logicor Clear Heater and InLine Hot Water System.

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1 Introduction

If you are a home owner you will at some point probably reach the point where you will either have to repair, renew or completely replace your gas central heating system. You may be tired of paying out already on repeated repair bills, want to upgrade your existing system to something more efficient, or have the advantage of planning a new-build home where you can specify a new heating system from the outset. A central heating system needs to heat both the home (space heating) and provide hot water.

This report aims to outline the options available for installing a new central heating system in an average sized UK home and compare the installation and product life costs of a modern conventional gas central heating system compared to Logicor's electric systems: the Clear Heater System (CHS) and InLine Hot Water System (ILHWS).

1.1 Central heating: Gas or electric?

Whether you choose gas or electric for your new central heating system you will soon realise that there are many options that may not have been available to you just 10 to 15 years ago.

1.1.1 Gas: Conventional central heating systems

These are the most common central heating systems currently installed in the UK. There are several different types of gas installation commonly available:

- Gravity fed (vented) system;
- High pressure (unvented) system;
- Combination (combi) boiler system.

1.1.2 Electric: Clear Heater System (CHS) & InLine Hot Water System (ILHWS)

The Clear Heater System (CHS) and InLine Hot Water System (ILHWS) are a modern electric alternative to the conventional gas central heating system. They work using infrared technology and use a control panel to monitor and control the settings and running costs.

1.2 How big is the average sized UK home?

In order to form a baseline to compare the different central heating systems we need to define the size of an average UK home and what the central heating requirements are to heat that home.

According to the Royal Institute of British Architect (RIBA) the average size of a home in the UK is 85m² and has 5.2 rooms, with an average of 16.3m² per room (1).

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We can assume that each room requires at least one heater unit. If we round up the number of rooms to six we can safely use the figure of six heater units or radiators needed in the average UK home. In reality the figure will probably be more than one heater per room but to compare like with like we can use six heater units as a baseline.

2 Repair, upgrade or a new-build installation?

First we will look at the most common situations facing people who own property and have to maintain a central heating system. Eventually all systems will need some maintenance, repair or replacement. The question most people face is when and what will it cost in the short and long term to repair or replace a system.

2.1 Repair

The first choice for many home owners would be to repair the faulty items on their existing gas system rather than replace the complete system; repairing the gas boiler is a common example. This can appear to be cheaper in the short term but repeated repair costs can quickly build up to reduce any potential energy savings from maintaining the existing system.

An old type boiler for example can have an efficiency rating of only 50% to 70%. A new condensing gas boiler will be A-rated with an efficiency rating of at least 90%. (2)

The Clear Heater System uses patented infrared technology and converts 100% energy into heat. (3)

2.2 Upgrade & replace

The next option for many homeowners would be to upgrade the whole central heating system for a new more efficient system. In this situation the choice between a conventional gas system or a new electric CHS and ILHWS becomes an option.

Upgrading the whole system can require higher initial costs than a repair but the potential savings made through lower running costs over the lifetime of the system may make it worth the investment.

The associated costs of upgrading an existing system can vary greatly depending on the property, the current system and which existing elements can be reused or removed.

2.3 New build installation

New build projects have the advantage of being able to make important decisions beforehand. The choices are the same as for upgrading and replacing an old central heating system but avoid the work, mess and cost of removing an existing system.

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A new gas central heating system will of course require a new gas connection to the property, which involves additional work and costs. The CHS and ILHWS in comparison require only an electricity supply.

For the purpose of this report we will base the installation costs of both a new gas system and electric CHS & ILHWS on a new build installation.

2.3.1 Additional benefits of choosing a new system

The gains of installing a new central heating system, whichever system is chosen can go beyond just the lower running costs. A combination gas boiler for example requires no hot water tank and is much smaller than a conventional boiler; this gives you the opportunity to relocate the new boiler and remove the water tank in the loft to free up extra space.

The CHS and ILHWS have neither boiler nor hot water tank so the space saving are maximised.

The Infrared radiant heat used by the CHS warms people and objects directly rather than heating the air and objects via convection as with traditional radiators. The same level of body comfort can therefore be achieved with a lower air temperature which means that humidity levels are healthier and air circulation is minimized. This reduces the risk of mould and damp formation as well as the spread of airborne particles, dust and spores.

There is also a large body of evidence, observations and medical acceptance from around the world that Far-Infrared heat therapies and heating is good for your health. (4)

3 Gas central heating - what are the options?

All gas central heating systems work on the principle of a gas boiler that heats the water for the hot water to your taps and the hot water for your radiators. There are a number of different gas boiler and heating combinations available.

3.1 Gas boilers

Since 2005 it has been compulsory to fit new condensing boilers in most circumstances because they are more efficient than the old type boilers; 90% efficiency for a grade-A condensing boiler, compared to only 50% to 70% efficiency for a non-condensing (old type) boiler. (2)

Condensing boilers convert more waste heat into energy which would otherwise be lost through flue gases in an old type boiler. In the unlikely event that a boiler engineer decides that your home is unsuitable for a new condensing boiler, you will receive a certificate to prove you can install a less efficient non-condensing model.

Unlike older type non-condensing boilers, new condensing boilers do require an extra pipe to drain away condensed water. If you are replacing an older type boiler the new boiler may have to be positioned in a different location, either by choice to free up space because condensing boilers are generally smaller or because the heating engineer will have to work out the best way to get to a drain connection from the boiler.

A poorly installed condensation pipe can freeze which will stop the boiler working so it is important to ensure the work is carried out properly. As with any gas appliance, a condensing boiler can only be installed by a 'Gas Safe' registered fitter.

If you are selling your home with a gas boiler system, you must provide a log book for your boiler as part of the Seller's Pack.

3.2 Which gas central heating system?

Whichever boiler type you have (condensing or non-condensing) there are three main gas central heating systems commonly available:

- Gravity fed (vented) systems
- High pressure (unvented) systems
- Combination (combi) boiler systems

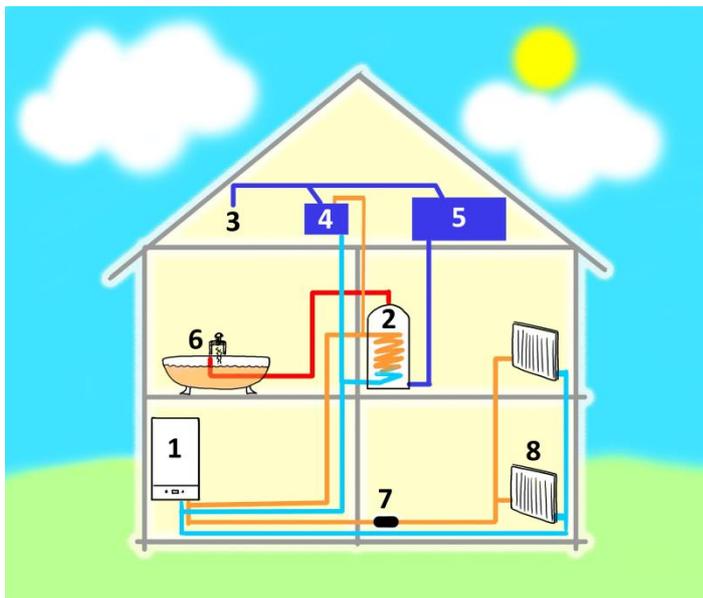
All three systems heat radiators in similar ways. The main differences are the water pressure that the boiler operates at and the way hot water is provided.

3.2.1 Gravity fed (vented) system

Most old systems in the UK are gravity fed but are now less common because combination boiler and unvented boiler systems are considered a much better solution when replacing or installing a new gas central heating system.

If you have a hot water cylinder (often fitted in an airing cupboard) then the gravity fed system can be identified if you also have a cold water tank (header tank) and an expansion overflow tank which are often located in the loft of a house.

The system relies entirely on the height of the header tank above the outlet point to create pressure, although the pressure can be increased with the addition of pressure boosting pumps.



Gravity fed system

Main components:

- 1 Gas boiler
- 2 Domestic hot water storage tank
- 3 Mains water supply
- 4 Expansion tank
- 5 Cold water tank
- 6 Hot supply to taps
- 7 Heating system pump
- 8 Radiators

Advantages include:

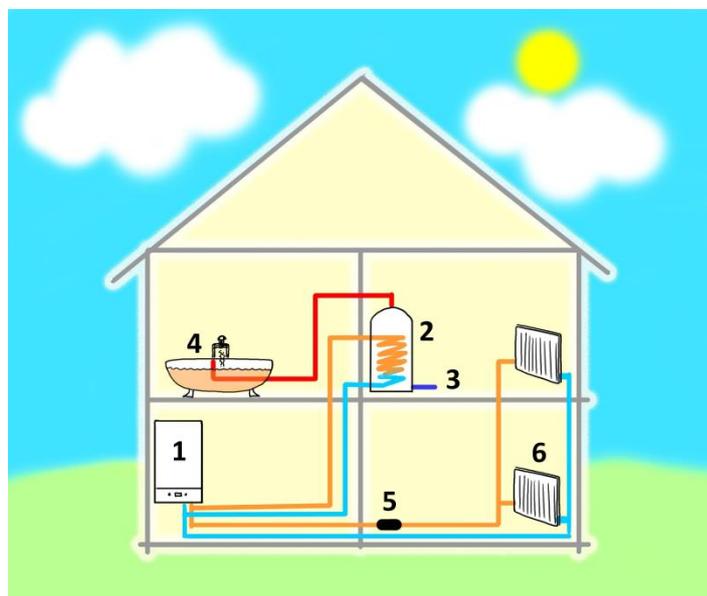
- Generally considered a safe system because it carries none of the risks of a high pressure (unvented) system.
- Can be used in combination with solar water heating or other heater sources.

Disadvantages include:

- The water pressure for hot and cold taps can be quite poor particularly in the bathroom as the flow depends on gravity and the height of the header tank.
- Extra requirement for a cold water storage tank and an expansion tanks. These tanks are often installed in lofts where they become vulnerable to frost damage resulting in water leaks and take up lots of space.
- In flats, where there is no opportunity to put the water tanks in a loft, shower water pressure can be poor unless a shower pump is used.

3.2.2 High pressure (unvented) system

This type of system operates at mains water pressure and with a hot water cylinder but does not need a header tank as with a gravity fed system. These are less common in the UK.



High pressure system

Main components:

- 1 Gas boiler
- 2 Domestic hot water storage tank
- 3 Mains water supply
- 4 Hot supply to taps
- 5 Heating system pump
- 6 Radiators

Advantages include:

- Hot water is at mains pressure capable of supplying several hot water outlets or more than one bathroom simultaneously.
- Header tank not required therefore saves on space on the loft.

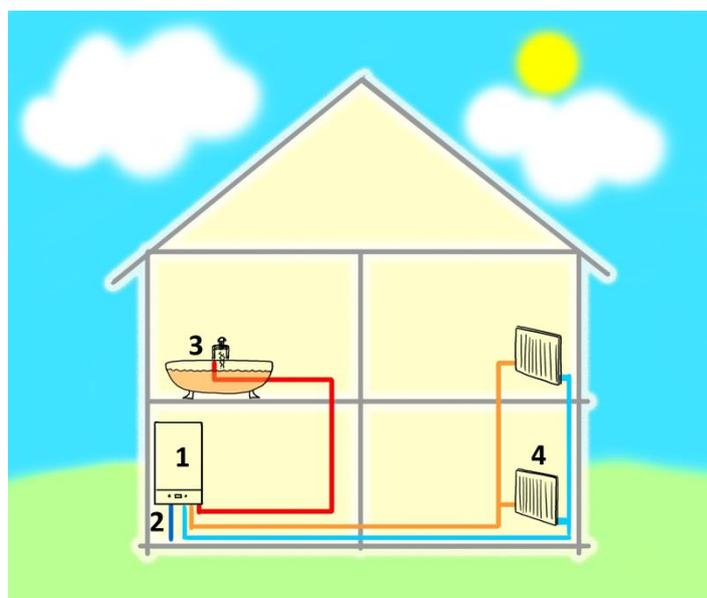
Disadvantages include:

- Higher risks associated with storing hot water at high pressure. Correct installation and maintenance must be followed and comply with G3 Building Regulations.
- An annual service is required to maintain safety standards.
- These systems tend to be more expensive than the combi systems as you have the additional expense of a hot water tank.
- They are less common than combi systems and require a higher skill level amongst installers so finding an experienced installer might be more difficult.

3.2.3 Combination (combi) boiler system

A combination boiler system is often referred to as a 'combi boiler' system and heats water on demand at mains pressure. A hot water storage tank and overflow tank are not required. In places where space and hot water requirements are limited, such as flats, these can be very popular systems.

The central heating function is on a pressurised closed loop system heated by the boiler when required.



Combi boiler system

Main components:

- 1 Gas boiler
- 2 Mains water supply
- 3 Hot supply to taps
- 4 Radiators

Advantages include:

- Hot water on demand at mains pressure.
- No hot or cold water storage tanks.

Disadvantages include:

- If more than one tap is open the hot water pressure can fall; most systems will struggle to cope with two bathrooms or a running bath and hot water tap simultaneously for example unless a high capacity combination boiler is installed.
- Not suitable in combination with solar water heating or other heat sources.

4 Gas central heating - the costs

4.1 Gas CH: Installation costs

We can assume that most UK households who decide to install a new gas central heating system will choose a combination heating system with a new condensing boiler.

Based on our scenario for a two storey house with six heater units, the approximate cost of installing a new gas central heating system is £3,189. (5)

This price can be broken down as follows:

| | |
|---------------------------------------|--------|
| Gas boiler parts and labour | £1,064 |
| Six radiators and labour | £711 |
| Water tank parts and labour | £107 |
| Pipe work parts and labour | £754 |
| Miscellaneous extras parts and labour | £265 |
| Total | £3,189 |

These prices are taken from the website:

www.whatprice.co.uk/tools/central-heating-costs.php

Their figures are approximate and are based on making the following assumptions:

- An average price for a combination gas boiler capable of up to about 90,000 BTU output.
- An average price for a parts and labour of a radiator.
- The average amount of pipe work required.
- An hourly rate for plumbers of £25.
- A call out charge for plumbers of £35.

4.2 Gas CH: Optional extras

Optional extras or unexpected work during installation can add greatly to the installation costs. A summary of typical extra costs that could be required depending on the property and system is outlined below. Some items would only be required if replacing an existing system or occur after several years use of a new system when repairs are needed. The cost for repairs and maintenance can often be minimised or offset by taking out a service insurance policy as described in Section 4.3.1.

4.2.1 *Installing a new gas connection to property*

For properties without a gas connection or for new build properties, a new gas supply will be needed. A typical domestic gas supply of less than 40 meters would cost around £300 to £1000 excluding VAT. (6)

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Non domestic, commercial and business gas connections of around 10 to 15 meters could cost around £1500 to £2500 excluding VAT. (6)

These costs could increase significantly if the property is more than 100 metres from a mains connection, for large users of gas (100kW or more) or for busy urban areas where a traffic management system is often required to allow safe access for trench digging and connection works.

4.2.2 Replacing a gas supply pipe

When an old boiler is replaced with a new combination or high pressure boiler the gas supply pipe from the meter to the boiler may need replacing if the pipe bore is too small and not supplying sufficient pressure to allow the boiler to work at optimal efficiency levels.

The costs for this will vary depending on the property but can typically vary from between £120 to £200. (2)

4.2.3 Electrical wiring

When an older system is being upgraded a professional heating engineer will want to ensure that any wiring complies with current electrical standards (Wiring regulations 17th edition). This may require the involvement of a qualified electrician and rewiring costs.

4.2.4 Replacement fan for combi boiler

Fans in combination boilers often become noisier over time as they wear out. The correct replacement of fans and the combustion chamber door is vital for the safe operation of a room sealed appliance. All seals should be checked and renewed where necessary.

This will usually involve two visits. The first visit to diagnose the problem and a second visit to return with the correct part and install it. Typical costs for this repair can vary between £200 and £270. (7)

4.2.5 Supply and fit a new central heating pump

Central heating pumps are a common element to fail early. The cost to replace a like for like pump of a reliable brand assuming that no modifications are needed is between £130 to £165. (7)

4.2.6 Powerflush an existing system

Over time, sludge and corroded metal can build up in the radiators, reducing their heating efficiency and putting the boiler under strain. Cleaning out the radiators using a high pressure pump can help the performance of your central heating system. Once the system is flushed then rust inhibitor is added to the system. The typical price to carry this out for 10 heaters can vary from £330 to £450. (7)

4.2.7 Magnetic filtration

This is another way to increase the life and efficiency of your central heating system. It's a simple unit that traps any dirt, debris and sludge that's created before it can do any damage to your boiler and controls.

It's easy to install and will keep your system running at maximum efficiency. Maintenance is simple; it just needs a clean when you have your annual boiler service. The cost can vary from £158 to £240. (7)

4.2.8 Energy efficient controls

Under the 2010 building regulations (part L1), a means of “controlling the temperatures independently in areas that have different heating needs (e.g. separate sleeping and living areas)” is required. This means using TRVs (thermostatic radiator valves) and a thermostat to give you greater control over the temperature in each room and reduce energy bills.

The costs of supplying and fitting new thermostatic radiator valves (TRVs) in a small two-bed terraced house with eight radiators can vary between £220 and £330. (7)

4.3 Gas CH: Running costs & maintenance

The cost of running a gas central heating system is influenced by many factors including the age of your heating system, lifestyle patterns, weather patterns and home insulation. A summary of typical maintenance costs including an annual service and the energy cost of running the system is outlined below.

4.3.1 Annual service & maintenance

Annual system maintenance is recommended and indeed required to ensure gas appliance safety but also to ensure the system runs efficiently. Many homeowners choose to take out a gas boiler and heating system insurance cover to help reduce the risk of unexpected repairs and maintenance costs. The typical cost of insurance cover ranges from £72 to £226 per year. (8)

Policies generally include an annual service of the boiler, call out charges, parts and labour for repairs. The maximum amount you pay for each repair often varies from zero to £95 depending on the policy. It is common that a faulty boiler will only be replaced with a new one if it is under seven years old; British Gas has this clause for example. (9)

If you don't have service insurance cover, the cost for a basic annual service can range from £53 to £72. (7)

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4.3.2 Running costs

We need to consider both electric and gas costs because although a Gas central heating system runs on gas it also requires electricity to control the thermostats and switches.

The average electricity consumption per household in 2014 was 4,115 kWh. (10)

The average gas consumption per household in 2014 was 14,263 kWh. (10)

Based on the Energy Saving Trust calculations (11) the unit price for energy is:

Average electricity price: 14.05 pence / kWh (Standard Rate)*

Standing charge per year: £69.97 (Standard Rate)*

Average gas price: 4.29 pence / kWh*

Standing charge per year: £87.92 (Standard Rate)*

* rates last reviewed Feb 2015 (11).

Annual household spend on electricity is therefore:

$$(4,115 \times 0.1405) + £69.97 = \mathbf{£648.13}$$

Annual household spend on gas is therefore:

$$(14,263 \times 0.0429) + £87.92 = \mathbf{£699.80}$$

Total annual domestic energy spend (Electric + Gas) per household is approx:

$$\mathbf{£648.13 + £699.80 = £1347.93}$$

The Department of Energy and Climate Change (DECC) most recent energy figures for 2012 show that **62%** of the total energy used in UK homes is spent on space heating and **18%** on heating water. (12)

Annual average spend on space heating is therefore:

$$£1347.93 \times 62\% = \mathbf{£835.72}$$

Annual average spend on heating water is therefore:

$$£1347.93 \times 18\% = \mathbf{£242.63}$$

We can assume that using a gas central heating system to heat your home will cost you approximately £835.72 per year, and £242.63 per year to heat your hot water.

If we include the average annual service cover of £149 per year, the typical annual cost of running a gas central heating system is therefore:

$$\mathbf{£835.72 + £242.63 + £149 = £1227.35}$$

4.4 Gas CH: Product life costs

Each individual part the gas central heating system has a different product life; that is how long an item is expected to function before needing replacement.

According to the Council of Registered Gas Installers (CORGI) a gas boiler can be expected to last between ten to fifteen years with regular maintenance (13). Old for new replacement when a boiler breaks down is often only guaranteed for seven years. (9)

Pumps, fans and other working parts can be expected to fail much earlier than the boiler itself. To be able to compare the costs of a gas central heating with a combined CHS and ILHWS we need to give a best estimate of a typical lifetime of the whole system before major components such as the boiler or when many of the individual parts need replacing.

The CHS and ILHWS heater units are guaranteed for twenty years and should last at least thirty three years. If we take the upper figure quoted by CORGI of fifteen years that a typical gas boiler will last before major repair or replacement it fits nicely at just under half the thirty-three year lifetime expectancy and just under the twenty year guarantee period of a CHS and ILHWS heater unit. We will therefore use two product life scenarios to compare their costs; twenty years and thirty years.

For this report we will use two product life scenarios; **twenty years** and **thirty years** for the product lifetime period comparing the lifetime costs of both systems.

4.4.1 Gas CH: Typical costs over 20 years

*Note: These figures are based on current prices and do not take into account price rises due to inflation over the product life period. Additional call out charges and excess charges per repair which can typically range from £50 to £70 per repair are not included.

Initial installation costs: £3,189 (5)*

Replacing gas boiler after fifteen years: £1,064 (5)*

Cost of space heating over 20 years: $£835.72 \times 20 = £16,714.40^*$

Cost of heating water over 20 years: $£242.63 \times 20 = £4,852.60^*$

Cost of annual service cover over 20 years: $£149 \times 20 = £2,980^*$

Total system cost over 20 years is at least £28,800*

If we average the total system costs over the 20 year period per year we get an annual cost of approximately £1440 per year.

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4.4.2 Gas CH: Typical costs over 30 years

*Note: These figures are based on current prices and do not take into account price rises due to inflation over the product life period. Additional call out charges and excess charges per repair which can typically range from £50 to £70 per repair are not included.

Initial installation costs: £3,189 (5)*

Replacing gas boiler after fifteen years: £1,064 (5)*

Cost of space heating over 30 years: $£835.72 \times 30 = £25,071.60$

Cost of heating water over 30 years: $£242.63 \times 30 = £7,278.90$

Cost of annual service cover over 30 years: $£149 \times 30 = £4,470$

Total system cost over 30 years is at least £41,073.50*

If we average the total system costs over the 30 year period per year we get an annual cost of approximately £1369 per year.

5 Logicor's electric central heating system

When installed together the Clear Heater System (CHS) and Inline Hot Water System (ILHWS) replace the need for a gas supply and provide an efficient modern alternative to a conventional gas central heating system.

Each system can be installed and operated independently or together and are controlled by the user via a control panel to monitor and regulate each system.

5.1 Clear Heater System (CHS)



The Clear Heater System is a phased electric infrared radiant heating system used to heat rooms (space heating). It consists of two main elements: the heating panels which radiate infrared heat, and the control panel to monitor and regulate the system.

The system uses a clever method of phasing energy between the heater units to minimize the total energy used. This means each heater panel only operates for 25% of the time to achieve the target temperature.

Far infrared waves are an efficient method of heating objects directly rather than first heating the air as with conventional radiators. Comparative data from Logicor's customers shows an average saving on heating bills of at least 50% and in some cases more. (3)

5.2 InLine Hot Water System (ILHWS)



The InLine Hot Water System is an electric hot water system that provides instant hot water on demand to your taps. The distance between the heater unit and the taps is minimized which reduces waiting time and wasted water. The ILHWS is designed to replace the need for a gas boiler and water storage tank in your home.

5.3 Control Panel

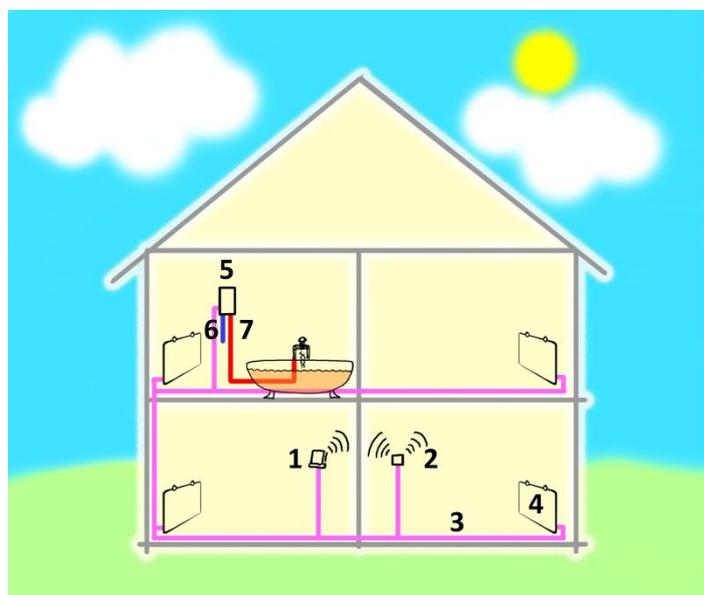
The control panel is the device that communicates with and controls the heater units and also allows the user to view status information and control individual heater settings and budget targets to name just a few of its many functions. It has a touch screen display to make it easy to use.

Installation is completed simply by connecting the power plug to a standard wall socket. Communication with the individual heater units works via the ring mains wiring that is normally standard in most UK homes. If connected to the internet via Wifi, software updates and new functions will be automatically downloaded and installed.

To simplify the cost comparison for this report, we will assume that both a CHS and an ILHWS will be installed together to provide both space heating and hot water for a property to provide a like for like comparison with a conventional gas central heating system.

5.4 CHS and ILHWS typical installation

The Clear Heater System and InLine Hot Water System are a very simple to install and require no complicated or messy building works. Both systems must be installed by a registered installer to ensure optimal heating performance, safety standards and building regulations are achieved.



CHS & ILHWS

Main components:

- 1 Control panel
- 2 Wifi router
- 3 Electric ring mains
- 4 CHS heater units
- 5 ILHWS heater unit
- 6 Mains water supply
- 7 Hot supply to taps

The CHS heater units are simply attached to the wall in the correct location and plugged into a standard electric wall socket. The ILHWS must be connected to the mains inlet cold water supply and a standard electric wall socket. Separate water tanks and boiler units are not required so the risk of stored water leaks and the risks associated with gas appliances are eliminated.

The control panel communicates with each installed CHS and ILHWS unit via the existing electric ring mains in the house. Almost all UK homes already have a mains electricity connection with a ring mains arrangement in the home so no additional utility connection is required. Automatic software updates and product improvements can be automatically downloaded from the internet and installed if a Wifi connection is available

Advantages include:

- No gas supply is required.
- No water storage tanks or boilers required.
- Easy energy budget control.
- No annual maintenance required.
- High energy savings.
- Fully upgradable so installation of a system can be in stages to match a budget.
- No harmful carbon monoxide emissions.

Disadvantages include:

- If you don't like the appearance it will look the same in 20 years time.
- If you have a current working gas fired system it will need to be removed so that the CHS and /or ILHWS can take its place.

6 Electric CHS & ILHWS - the costs

6.1 Combined CHS & ILHWS: Installation costs

Based on our scenario for a two storey house with six CHS heater units, one ILHWS heater unit and one control panel, the approximate total cost would be approximately £6,930.

This price can be broken down as follows:

| | |
|----------------------------|-----------------------------|
| Six CHS heater units | £3600 |
| One ILHWS heater unit | £1400 |
| One Control Panel | £850 |
| Miscellaneous extras parts | £550 |
| Installation costs | £400 to £660 (average £530) |
| Total | £6930 |

6.2 Combined CHS & ILHWS: Optional extras

In addition to the standard installation there are a range of optional extras available that either extend the functionality or provide cosmetic functions. These include:

- Towel rail
- Air freshener
- Picture frame
- Wall brackets
- Clothes horse (CHS dryers system)

6.2.1 Extra CHS heater units

Larger homes or larger rooms may require additional heater units than in our example here. The approximate cost per extra CHS heater unit would be approximately £600 plus installation.

6.2.2 Extra ILHWS heater units

The approximate cost per extra ILHWS heater unit would be approximately £1400 plus installation.

6.3 Combined CHS & ILHWS: Running costs & maintenance

The simplicity of the combined CHS and ILHWS installation means that an annual service and maintenance are generally not required.

6.3.1 Running costs

Based on Logikor market research and comparative data from Logikor's customers the CHS has been shown to save on average 50% off their heating bills. (3) We can therefore base the energy costs of using a CHS as a percentage of the energy costs of using a conventional gas central heating system in section 4.3.2.

The InLine Hot Water System heats water about 43% cheaper than using a modern A-rated gas boiler.(14) The energy costs of using an ILHWS can therefore be based as a percentage of the energy costs of using a conventional gas central heating system to heat water in section 4.3.2.

CHS calculations:

Annual average spend on space heating using a conventional gas central heating system is £835.72.

The CHS saves on average over 50% on their heating bills (3). Therefore based on our calculations in section 4.3.2 for gas central heating annual energy costs the cost of using the CHS system to heat the average UK home would be approximately:

$$\mathbf{£835.72 \times ((100-50) / 100)} = \mathbf{£417.86 \text{ per year}}$$

ILHWS calculations:

Annual average spend on heating water using a conventional gas central heating is £242.60.

The ILHWS heats water 43% cheaper (14) than a modern A-rated gas boiler system, therefore the annual energy spend on heating water using an ILHWS could be approximately:

$$\mathbf{£242.60 \times ((100-43) / 100)} = \mathbf{£138.28 \text{ per year}}$$

We can assume that using a Clear Heater System to heat your home could cost you approximately £417.86 per year and £138.28 per year to heat your hot water with an InLine Hot Water System.

The total energy costs would be approximately £556.14 per year.

6.4 Combined CHS & ILHWS: Product life costs

The CHS and ILHWS heater units are guaranteed for twenty years and should last at least thirty three years. Based on our previous assumption in section 4.4 we are using two scenarios for the product lifetime of our central heating systems; twenty years and thirty-three years.

6.4.1 CHS & ILHWS heater unit lifetime costs

Both the CHS and the ILHWS heater units are guaranteed for twenty years with an expected product life of thirty three years. We can therefore assume that over thirty years we will not need to replace any CHS or ILHWS heater unit.

6.4.2 Control panel lifetime costs

Since the control panel is a unit that is regularly handled and operated by the custom it has a higher risk of accidental dropping and cosmetic wear and tear over time. For this reason the control panel is guaranteed for five years but with normal careful handling it can be expected to last much longer.

If we assume that a cosmetic upgrade to replace or repair the casing is preferred every five years which costs on average £200, the cost over 20 years for control panel upgrades may be in the range of £600 for and for 30 years in the range of £1000.

If we consider a situation where the customer chooses not to have cosmetic upgrades to the control panel but instead accidentally breaks a control panel or a fault occurs outside the guarantee period, the cost for one replacement in 20 years is £850 and two replacements in 30 years would costs £1700.

6.4.3 Combined CHS & ILHWS: Typical costs over 20 years

*Note: These figures are based on current prices and do not take into account price rises due to inflation.

Initial installation costs: **£6930 ***

Upgrading or replacing control panel once: **£850***

Cost of space heating over 20 years: **£417.86 x 20 = £8,357.20***

Cost of heating water over 20 years: **£138.28 x 20 = £2,765.60***

Cost of annual service cover over 20 years: £0 x 20 = £0 (no service required)

Total cost over 20 years is at least £18,902.80*

If we average the total system costs over the 20 year period per year we get an annual cost of approximately £945.14 per year.*

6.4.4 Combined CHS & ILHWS: Typical costs over 30 years

*Note: These figures are based on current prices and do not take into account price rises due to inflation.

Initial installation costs: **£6930 ***

Upgrading or replacing control panel twice: **£1700***

Cost of space heating over 30 years: **£417.86 x 30 = £12,535.80***

Cost of heating water over 30 years: **£138.28 x 30 = £4,148.40***

Cost of annual service cover over 30 years: **£0 x 30 = £0 (no service required)**

Total cost over 30 years is at least £25,314.20*

If we average the total system costs over the 30 year period per year we get an annual cost of approximately £843.81 per year.*

7 Summary

When considering which central heating system to install, it is important to consider not just the initial installation costs, but most importantly the lifetime running costs. The running costs and additional repair and replacement costs can quickly mount up. The world energy market and global politics also has a huge influence on the price of energy, so choosing the right system now can save you money in the long term.

The cost of installing a combined CHS and ILHWS is slightly higher than installing a conventional gas central heating system.

The advantage of the combined CHS and ILHWS over a conventional gas central heating system is not just its simpler installation arrangement but also the longer product life and the lower maintenance and running costs. When we take this into consideration and allow for a margin of error in our calculations the combined CHS and ILHWS is still substantially cheaper in the long run to install and operate.

Based on a 20 year product life:

The annual costs of installing and using each system to provide hot water and space heating in a typical UK home based on our example is:

£1440 per year using a conventional gas central heating system*

£945.14 per year using a combined CHS and ILHWS*

The combined CHS and ILHWS appears to be 34% cheaper than a modern gas central heating system when considering all the costs over 20 years.*

Based on a 30 year product life:

The annual costs of installing and using each system to provide hot water and space heating in a typical UK home based on our example is:

£1369 per year using a conventional gas central heating system*

£843.81 per year using a combined CHS and ILHWS*

The combined CHS and ILHWS appears to be 38% cheaper than a modern gas central heating system when considering all the costs over 30 years.*

Central Heating Cost Comparison

*Assumptions:

- *These figures are based on current prices and do not take into account price rises due to inflation over the product life period.*
- *Fluctuations in energy prices over the product life period.*
- *Both systems are assumed to be a new installation. The cost of removing an existing heating system would have to be accounted for when replacing or upgrading and existing system.*
- *Additional call out and excess charges per repair on a Gas central heating system which can typically range from £50 to £70 per repair are not included.*

The lifetime costs of installing and using a combined Clear Heater System and InLine Hot Water System could be between 34% and 38% less than installing and using a modern conventional Gas central heating system over a 20 to 30 year period.

Beyond the basic cost comparison a number of other advantages of using a combined CHS and ILHWS compared to a conventional gas central heating system are apparent from this report.

It is clear that gas central heating systems are generally more complicated and have more major components than the relative simplicity of a combined CHS and ILHWS. Gas central heating systems therefore have a greater potential for component failure and require repair or replacement work more often than a combined CHS and ILHWS.

Gas has inherent risks when used in home appliances. High pressure central heating systems also have the added risk of high pressure hot water. Gas appliances need regular safety checks. In comparison, the combined CHS and ILHWS are relatively low risk systems requiring only a standard electricity supply and minimal maintenance and service safety checks.

Consumer choice often comes down to more than just choosing the cheapest product. We have shown here that Logicor's heating systems are cost effective in comparison to conventional gas systems. Cost comparison is important but for many consumers product quality and lifestyle choices sway the final decision.

We at Logicor are confident that our heating systems are very efficient and often cheaper to run than conventional systems but also their quality and innovative technology bring many additional positive benefits to the domestic and office environment.

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