

# The history of wood heating environmental sciences essay



**ASSIGN  
BUSTER**

This is one area that you have to do your homework as choosing the wrong type of heating for your house could end up costing you a lot over the long term. There are so many types and methods of heating currently available on the market which makes choosing the right one even more difficult. The first thing you have to decide on is which type would be suitable for your needs.

**Radiators:** This is when hot water leaves the heat generator ( e. g boiler) and through pipes enters radiators around the house and returns to the heat source to be warmed up again. This method has been used in Ireland for many years. The main problems with it is that in most cases there is a lot of heat loss in a room due to the fact that heat rises and before it has a chance to reach the other side it starts to cool.. The other disadvantages are that you will usually end up with a cold floor that you do not get with underfloor heating. The other point you have to consider is that you can not place furniture's in front of radiators as it blocks the passage of heat, and therefore giving you less options with your decorations.

**Underfloor Heating:** This method has been in use in continental Europe for many years but it has only been in use in Ireland for the past few years. There are no radiators involved, only pipes which are placed all across the floor. Like radiators the heated water comes from the heat generator ( e. g boiler ) and travels through these pipes and gives even heat all across the room before it returns to be heated again. The main advantages of this system are the even heat you get through all of the floor with no cold spots and you do not lose out any space to radiators as everything is under the floor. One disadvantage this system might have is that initially it costs a bit more than the radiator system but over the long term it pays for itself.

**Heaters:** This system works on the same principle as radiators but instead of  
<https://assignbuster.com/the-history-of-wood-heating-environmental-sciences-essay/>

the heat coming from a heat source and through pipes, the heat is generated in the heater itself. The main principle is that an element heats fire bricks until it gets very hot and then it stops. The heat is then radiated slowly into the air until there is no more heat at which point the process starts again. As this system works on electricity it is considered one of the most expensive ways of heating your house unless you mainly use it at night time and through night time rates of electricity. The main disadvantage of this system is that you can not have a lot of control over the heat. Once the bricks are hot you can not just switch them off. Vented Air System works on the same principle as a hair dryer. The air heated through electrical elements and then is circulated around the house via ventilation tubes placed in the walls. The main disadvantage of this system is that unless you have fresh air going into the system all you are doing is circulating stale air around the house. The other problem would be that if there is not a good filtration system installed you could have problems with dust gathering in the tubes which would not be good for people with asthma. However, there are systems on the market that would filter out any bad air and give you constant warm fresh air. Go to Sick Building Syndrome for your options. Wood Pellet Stoves are highly efficient, clean burning and totally automatic. For more information go to:      Wood Pellet Stoves

## **Wood Pellet Stoves**

The old fashion traditional wood fire, everyone loves the idea of having a natural fire in their house. It looks nice, and it gives you heat and pleasure to look at it. However as nice as it is, open fires and old fashion stoves can be very polluting and inefficient as well as all the trouble of starting and

cleaning the mess. So what is the solution? The answer comes in modern wood pellet stoves which give you the warmth and comfort of natural wood fires but are highly efficient, clean and hassle free as they are totally automatic which means that it saves you the time and money. Fuel for the stoves is made of dried, finely ground wood waste that is compressed into hard pellets about the diameter of a pencil and up to 2 cm (1 in.) in length. Once a full bag of pellets (which are in bags of 10 to 15 kg) are loaded into its hopper, a stove can run automatically for up to 24 hours as the pellets are slowly released into a small combustion chamber. So a fire without the hassle of lighting as it comes with an automatic ignition which starts with the push of a button, a fire that is very easy to clean as the ash pan only needs to be cleaned once a month, and a fire that only need clean pellets as a fuel. But how safe are they compared to the wood fire? Actually, they are very safe as most come with a number of safety features including measures against power failure and overheating problems. The other main safety feature is that these stoves ventilate only the warm air into the room and do not heat up themselves. As if all the above feature was not enough to convince anyone thinking of having a new stove for their house, there is also something for the gadget lovers within us. There is a phone home remote control feature which allows you to use your mobile phone to call the control panel and asking it to start warming the house before you get there. The cost of the stoves start from around €1200 and the cost of the pellet bags are between €2 to €4. Make sure that you purchase quality pellets to ensure a trouble free operation of your stove. Always see if the bag has the quality mark and complete fuel analysis printed on it. Now remember that wood pellets are a renewable source of energy and they do not contribute to

<https://assignbuster.com/the-history-of-wood-heating-environmental-sciences-essay/>

climate change, so do seriously consider them as part of the heating for your new house.

## **Oil Heating**

Heating oil, or oil heat, is a low viscosity, flammable liquid petroleum product used to fuel building boilers. It is the most popular form of heating in Ireland although natural gas is quickly catching up, particularly in urban areas where it is easy to connect to the distribution system. Heating oil is commonly delivered by truck tank to residential, commercial and municipal buildings and stored in above ground storage tanks, also known as AST's, located in the basements, garages, or outside adjacent to the building. Heating oil is less commonly used as an industrial fuel or for power generation. Heating oil is widely used in parts of Europe, the United States and Canada where natural gas or propane is frequently not available. Heat from Oil is measured in BTUs (British Thermal Units) and in a situation where one is considering what fuel to use in a new build home, it is easy to calculate by room volume what number of BTUs are needed to sufficiently heat the room and thereby estimate what your running costs are going to be. Boiler manufacturers have perfected "retention head oil-fired burners" and "triple-pass flue" boilers that have increased theoretical oil burner efficiency to over 93%. To reach that level of efficiency, however, would require a lower flue gas temperature that most oil burners cannot produce therefore causing condensation that most oil-fired furnaces cannot handle without damage to the heat exchanger, venting pipes or outside casing of the appliance. Hence, the maximum practical efficiency is typically lower at around 86%. Heating oil is very similar to diesel fuel, and both are classified as distillates. It consists of

a mixture of petroleum-derived hydrocarbons. In Ireland, the common types are derv (diesel) and kerosene. The diesel used in domestic boilers, called green diesel is coloured green to distinguish it from road diesel which attracts a higher rate of duties and taxes. For efficient burning, the oil is drawn/pulled from the tank into a pump and pressurized (residential) to 100-140 psi and then forced through a filtered (specific to appliance) nozzle, into an atomized spray pattern. It is then ignited with a step-up transformer, taking 120 volts (AC) and stepping it up to 10,000 volts. The voltage travels down two brass conductors (buzz bars) to the metal/ceramic electrodes and produces a spark approximately 1/4 inches across. With the airflow coming from the squirrel cage of the oil-burner, the spark ignites the oil droplets. Through the use of a combustion chamber, the flame is contained, and flue gases travel through the heat exchanger. The heat of the flue gases is transferred through the walls of the heat exchanger as they pass to the chimney, and the fan/blower unit circulates the heat of the heat exchanger throughout the house. With a cold air return generally in the centre of the house supplying all or most of the cold air that is returned to the boiler for re-heating. Oil is, without doubt, the most efficient and fast producer of heat in a domestic situation. The problem with it is fluctuating cost and concerns over supply. It is also environmentally harmful because of the nature of combustion. However, it without peer in providing quick and controllable heat and remains popular in Ireland because of these qualities.

## **Coal Heating**

While few homes in Ireland burn coal for heat these days, it is still used by many industries, such as steel and cement plants. Natural gas and oil are

generally the preferred fuel sources because they burn more cleanly and are more efficient. Coal originated as a source of fuel because vegetation trapped between layers of rock turns into coal via underground heat and pressure. The process takes millions of years, which is why coal is designated as a non-renewable resource. Coal is a long-lasting fuel source because it contains hydrogen, oxygen, and carbon. Boiler technology has vastly improved in recent years. In older times, coal boilers or furnaces were inefficient and lost a lot of the heat they generated. Coal contains fumes within a sealed steel box. Heat exchangers extract the warm air and vent it through the same heat distribution systems that other types of boiler use. Coal-burning boilers are now preferred for central heating. Manufacturers claim this type of heater runs 50% more efficiently than older coal-burning boiler and also heats the hot water supply for the household. The mining of coal is fraught with danger, expense and air pollution when explosions happen in mines as they regularly do, particularly in developing countries. Deadly fires frequently break out below ground in coalmines, and there is no viable way to extinguish them. These fires do not just destroy the coal; the smoke, sulfur, and carbon dioxide gases they release pollute the air. The fires also kill vegetation above ground. Underground coal fires in China destroy more coal than miners extract in that country. Some fires in the US are still burning after decades. Coal is also a resource that is running out. Some experts claim there is only enough coal left worldwide to last about 150 years. Despite these drawbacks, in some parts of the world, coal is still a major heat source. In China and many other countries, people still burn coal in poorly ventilated and inefficient stoves. The health repercussions can be deadly. Not all the news regarding coal is negative. Researchers interested in <https://assignbuster.com/the-history-of-wood-heating-environmental-sciences-essay/>

coal use are working on correcting its polluting properties. Their work also includes finding ways to preserve the coal supply so it will last longer. There is ongoing worldwide exploration to find new areas of coal deposits.

Inventors are also creating more efficient appliances for burning coal. Coal is a great back up fuel to have with, say, electricity or gas where supply can be interrupted. You will however need a separate back boiler in your fireplace to be able to take advantage of it. However, that boiler can also burn other fuels such as wood or turf.

## **Wood Heating**

Ireland has a tradition of affinity to wood as a means of heating the home. Wood is a real alternative to other fuels particularly in countries that have a large ratio of forest to land. A real wood fire satisfies as no imitation can. Each fire is unique, following its random path from lit kindling to dramatic flames to red coals. The soft glow of the fire creates a memorable setting for intimate conversation. It is the place where family and friends gather. Gazing into the fire in a quiet moment, your imagination is free to soar on flights of fancy or probe the depths of the soul. A wood burning stove or heating fireplace bathes the room with a rich, soothing warmth that no other energy source can equal. The fire's radiance gives a welcome embrace as you come in from the cold. With its all-natural ingredients, a real wood fire is a hearty tonic for winter chill. When you warm your life with wood, you participate in a natural cycle and an ancient human ritual. The simple act of stirring coals and placing logs on the hearth is one we share with ancestors who lived at the dawn of human history. Burning wood for warmth is still satisfying. True, it takes a little extra effort, but like tending a garden or home cooking a



meal, you are always rewarded. Solar power from the sun, wind power, and wood energy are renewable resources, meaning they can be used forever without depleting the earth. Using renewable energy is like living off the interest earned by the earth's assets, and never touching its savings. In contrast, fossil fuels like oil, gas and coal are not renewable and their consumption is the leading cause of global warming. Burning fossil fuels sends carbon dioxide, the main greenhouse gas, on a one-way trip. It pumps million-year-old carbon from inside the earth into the atmosphere, where the concentration of carbon dioxide is increasing. Burning oil, gas and coal is like spending the earth's savings, and scientists say it is changing the global climate. Wood fuel is different. As trees grow, they absorb carbon dioxide from the air in a process powered by the sun. Indeed, about half the weight of dry wood is this absorbed carbon. A tree destroyed in a forest fire or one that falls and decays in the forest gives up its carbon once again to the air as carbon dioxide. So continues the earth's carbon/carbon dioxide cycle. When trees are used for energy, a part of the forest's annual growth is diverted from the natural decay and forest fire cycle into our homes to heat them. Both natural firewood and wood pellets — made by compressing waste sawdust — are energy products from the forest. Well-managed forests can be a renewable, sustainable source of energy that helps us reduce greenhouse gas emissions by displacing the use of oil, gas and coal. Some may view a wood stove or fireplace as old fashioned, but that image is out of date. Things have changed a lot. Innovative research has transformed the trusty old wood heater from a clunky black box into a marvel of modern heating technology. Yet none of the charm and beauty of the natural fire has been lost. An advanced technology stove or fireplace will not pollute your

<https://assignbuster.com/the-history-of-wood-heating-environmental-sciences-essay/>

indoor air and you will see no smoke coming from your chimney. It can deliver up to 75 percent seasonal efficiency while emitting 90 percent less smoke than the old " airtight". This means you will need about 1/3 less wood for the same amount of heat. The new technologies raise the temperature of the fire, making it more beautiful than ever and keeping the fire viewing glass crystal clear. Now you can enjoy the pleasures of a real wood fire and cast your vote in favor of the environment at the same time. Modern wood burning stoves and fireplaces are a perfect match for new energy efficient houses. A centrally located wood stove can fully heat a home of moderate size, and for larger homes, the heat from an elegant new fireplace can be ducted to all areas. No more chilly rooms. And no more getting up in the night to feed the fire, all the advanced models deliver a reliable overnight burn. When all else fails, you can count on a real wood fire. Without heat, an emergency becomes a disaster, but with a reliable wood heater and a few candles, you will turn it into a family adventure. When storms rage and the power lines go down, your family will be warm and cozy. The bottom line is; do not ignore wood when considering the installation of your heating system. Sustainable Energy Ireland (SEI) has more information on its website.

## **Turf Heating**

One thing that Ireland possesses in abundance is bogs. In this bog-rich country powered mostly by solid-fuel power plants, most households are continuing to shovel into their fireplaces and stoves the same fuel that has been used in Ireland for the past several centuries. Bogs produce turf and turf will burn when dried. This is the original Irish fuel. Cut painstakingly for centuries from the Irish bog using specially designed, long, flat shovels, turf

is harvested by hand in some places today. Once cut, the turf is set out to dry in piles. Bord na Mona, the semi-state body in charge of producing this mostly from midland bogs, has introduced machinery harvesting and this has made production much more efficient. However, there remains many independent producers with small holdings of bog that use it for their own consumption or sell it to an intermediary who will sell it on to Bord na Mona. Rights to cut plots of turf from the bog in Ireland have been handed down through families for generations. Even today, adult children return home at the end of summer to assist parents in turning the turf in its drying process. Turf looks, for the entire world, like a dried piece of mud with bits of vegetable matter sprinkled through it. In reality, a vegetable matter has been buried and compressed in the strange and harsh bog environment for thousands of years. Left to itself for another several thousand years, this stuff would be well on its way to becoming a more potent fossil fuel. You can always tell when winter has hit Ireland by the lovely smell of turf burning. Unfortunately, it does smoke quite a bit, but it produces an aromatic smoke with a lovely character. It takes a while to catch, relying more on heat than open flame. Turf takes a while to light, but once caught it burns completely to ash and provides a long-lasting, warm fire. No wonder the ancient Celts made it a habit to use this as their primary fuel. Turf is quickly disappearing as the Irish need for fuel increases. Scientists tell us that turf will no longer be burned in as little as 5 years from now. Already it is illegal to burn turf in certain metropolitan Irish areas (like Dublin). In the midlands, you can find places to harvest your own turf for a fee or purchase harvested turf from numerous private entrepreneurs who have more turf than they can use.

personally. Chances are, if you visit an older country pub in Ireland they will be burning turf in the fireplace.

## **Gas Heating**

Natural gas space heating is an efficient and economical method of home heating. It is extremely popular in Ireland and is the most common source of heating in apartment blocks and large municipal buildings such as hospitals, schools and general industry. Ireland is blessed by the fact that we have a wonderful source of gas on our doorstep. Kinsale gas field, off the coast of County Cork is a productive field discovered and operated by Marathon Gas. The Kinsale head gas field started production in 1978. The field is produced through two platforms, Alpha and Bravo, with Bravo production routed through the Alpha platform, co-mingled with the Alpha production and exported via a 24-inch pipeline to the onshore distribution system. The Irish government then set up a project, which piped the gas to the main cities and towns of the country. This project is still active with supplies being spurred to smaller and more remote towns. The disadvantage with this is that it is impossible because of economic scale to service rural areas. Any home can use gas space heating. In areas where natural gas is not available, heaters can be run on liquefied petroleum gas (LPG or 'bottled' gas), although currently this is a significantly more expensive option. Note that natural gas and LPG are not interchangeable in individual heaters. You will need to specify the fuel appropriate to your area prior to purchasing a heater. Most gas space heaters display an Energy Rating label with 1 to 6 stars. This label identifies the energy efficiency of the heater—the more stars, the more efficient. Energy efficient units produce more heat for each unit of gas

consumed—a 6 star unit will cost up to €100 less a year to run than a 1 star unit of the same capacity (on natural gas). Convective gas heaters circulate warm air around a room. They include wall furnaces; floor-mounted console units; and some gas log fires. Convective heaters perform best in well-insulated, draught-free areas with low to moderate ceiling heights, where warm air can quickly fill the room. Radiant/convective heaters produce some of their heat by direct radiation from hot surfaces. They include console units with red-hot ceramic panels and some gas log fires and gas fired potbelly heaters. Radiant/convective heaters are more effective in warming areas with higher ceilings than convective heaters. Some gas log fires are classified as ‘decorative’. These are generally inefficient and are not suitable as the primary heater in a room. Most gas heaters either radiant or convective are flued. Some console convective heaters and gas log fires use ‘balanced’ or ‘power’ flues, which connect directly through an external wall to the outside, and use external air for combustion. Balanced flue heaters generally have a high level of energy efficiency. Adequate ventilation is essential when operating un-flued heaters, which may lead to large heat losses through room air leakage and draughts. Your heating supplier is responsible for advising on the correct level of ventilation required. Flued gas space heaters will adequately heat areas from 30sqm to 100sqm. Un-flued heaters will heat areas up to approximately 70sqm. Gas space heaters are suitable for living areas. They are not appropriate for installing directly in bedrooms, but could be located in a hallway adjacent to such rooms. They are also unsuited for utility areas or for individual heating of small rooms (e.g. separate studies). Un-flued heaters regularly lose heat during use, wasting heat produced and causing draughts. Convective or fan assisted models can

<https://assignbuster.com/the-history-of-wood-heating-environmental-sciences-essay/>

circulate dust. Un-flued heaters produce small amounts of irritant and/or noxious fumes during combustion (flued heaters exhaust these to the outside). LPG-fired heaters currently cost approximately two and a half times more to run than natural gas heaters, and need space for a storage cylinder. Accurate sizing is essential before buying a space heater unit. It is recommended that you should consult an expert and draw up a detailed heat load survey by a qualified technician recommended by the heater's manufacturer or retailer. See our Find a Professional section on [www.heatingireland.com](http://www.heatingireland.com). Under or oversized units will give poor performance. As a guide, allow 100W heat output per square metre of floor area if your ceilings are insulated, and 80W per square metre if both ceilings and walls are insulated. Un-insulated houses will require higher levels of heating. A thermostat ensures that heat is not wasted through overheating. Space heaters have integral thermostats, although radiant/convection models often lack them. A setting of 18–21°C is adequate for living areas. Programmable thermostats and timers is recommended as they allow greater heating flexibility and can potentially lower running costs. Ceiling fans help to distribute heat quickly around the rooms, being particularly useful in rooms with higher ceilings (fans cost less than one cent an hour to run). The simplicity, effectiveness, and availability of supplies make gas a very favoured option for home heating in Ireland.

## **Geothermal Heating**

Geothermal heating has been used since the time of the Roman Empire as a way of heating by utilizing sources of hot water and steam that exist near the surface of the Earth. The ultimate source of geothermal energy is

<https://assignbuster.com/the-history-of-wood-heating-environmental-sciences-essay/>

believed to be from the radioactive residue that occurs deep within the Earth's crust. Where geothermal resources are available, it is possible to distribute hot water or steam to multiple buildings. In recent years, the term geothermal heating has frequently been used to refer to the heating and cooling that can be achieved with a geothermal heat pump. This technique is generally for residential use. It involves a refrigerant liquid being pumped through pipes in the ground, heating the liquid. This liquid is brought back into the house, and the heat exchanged. The same technique is used to cool the house. Geothermal heat pumps take advantage of the natural constant temperature of the earth. During winter when the ground temperature is warmer than the air above it, geothermal heat pumps use the earth's soil (or groundwater) to recover the earth's heat. In contrast, an air-source heat pump will remove heat from the cold outside air and thus requires more energy. In the summer months, geothermal heat pumps deliver heat to the same relatively cool soil (or groundwater) rather than delivering it to the hot outside air. As a result, the heat is pumped over a smaller temperature difference with a geothermal heat pump and this leads to higher efficiency and lower energy use. Geothermal energy is a type of renewable energy that encourages conservation of natural resources. Geothermal systems are estimated by experts to save homeowners 30-70 percent in heating costs, and 20-50 percent in cooling costs, compared to conventional systems. Geothermal exchange systems also save money because they require much less maintenance. In addition to being highly reliable, they are built to last for decades.

## Solar Heating

Every solar water-heating system features a solar collector that faces the sun to absorb the sun's heat energy. This collector can either heat water directly or heat a "working fluid" that is then used to heat the water. In active solar water-heating systems, a pumping mechanism moves heated water through the building. In passive solar water-heating systems, the water moves by natural convection. In almost all cases, solar water-heating systems work in tandem with conventional gas or electric water-heating systems; the conventional systems operate as needed to ensure a reliable supply of heated water. There are many types of solar water heaters. Each has strengths to recommend it for specific climates and water conditions. Solar system professionals from [www.solarpanels-ireland.com](http://www.solarpanels-ireland.com) can help you select the most appropriate system for your area and your needs. The drawback in any form of alternative heating and energy source is usually the up-front capital investment. The energy in sunlight can be used for many purposes, including heating water for a building or swimming pool. And using solar energy has many environmental and life-cycle economic benefits. However, solar energy heating or solar electric products often have initial costs than other, similar products do. This means it will probably cost more initially to purchase and install a solar system than it will to purchase and install another kind of heating or electric system. Still, in nearly all cases, you will recover your initial costs through substantial fuel savings (as shown in lower utility bills) over the life of the product. Most solar systems last from at least 15 to 25 years. The great thing about it is that once installed the running costs to heat what you wish are practically nil. Install an oil boiler and you still have to buy the oil. The sun comes free!

<https://assignbuster.com/the-history-of-wood-heating-environmental-sciences-essay/>



## Wood Pellet Boilers

Many building owners in Ireland use fossil heating fuels, such as oil or propane, for space heating. These fuels are often expensive and unstable in pricing. In addition, they threaten the global climate and sustainability of communities. Proven alternatives to fossil heating fuels exist and are already in use in Ireland. Biomass fuels are a local, renewable resource for providing reliable heat. Wood pellets are a common type of biomass. Biomass is any biological material that can be used as fuel—including grass, corn, wood, and biogas as well as other forestry and agricultural residues. Wood pellets are compressed by-products from the forest products industry, often woodchips and sawdust. They are a locally available and a cost-effective heating fuel with several advantages over other types of biomass. Wood pellets are a condensed uniformly sized form of biomass energy, making them easier to store and use than many other biomass fuels. Pellet heating technology is also quite simple, minimizing operation and maintenance requirements. These heating systems can be easy to plan for and install and can save a building owner thousands of euro in energy costs over time while providing significant local economic and environmental benefits. However, the recurring problem with wood pellet boiler and distributions systems is that most homes in Ireland are too small to extract the economic value from using them. A large individual house in excess of 300sqm would justify the installation of a wood pellet system. The Irish Government had for a period a grant-aid system going that made them economical in smaller homes but this no longer available. That said, when the grants were in place the take up was strong and now thousands of Irish homes have systems installed Using biomass fuels helps mitigate such environmental issues as acid rain and <https://assignbuster.com/the-history-of-wood-heating-environmental-sciences-essay/>

global climate change. Perhaps the greatest advantage of biomass fuels, however, is that they cost on average 25-50 percent less than fossil heating fuels and are more stable in pricing. It is unlikely that any future carbon or energy taxes will increase the cost of biomass fuels and are more likely to raise the cost of heating with fossil fuels. The technology is becoming well established in the European market and spreading now to the heating industry in Ireland and the choice to heat with biomass fuels can be as simple as choosing a traditional fossil fuel heating system. In addition, wood pellets:

- are convenient and easy to use, and can be bulk stored in less space than other biomass fuels
- have a high energy content, and the technology is highly efficient compared to other biomass fuels
- are a clean-burning renewable fuel source
- are produced from such waste materials as forestry residues and sawdust
- are price stable compared to fossil fuels

Wood pellets are available for residential use in 20-kilo bags from feed stores, nurseries, and other supply outlets. Increasingly, heating with wood pellets is becoming common on larger scales—in municipal or federal buildings, educational facilities, housing complexes, office buildings, and other businesses. The greater heating requirements of these larger buildings differ from those of residential settings, thus requiring different technology (boilers rather than stoves) and fuel supply infrastructure (bulk wood pellet supply rather than bags). The best candidates in the industrial, commercial and municipal buildings sector for wood pellet boilers are buildings between 1, 000 and 5, 000 square metres that use heating oil, propane, or electricity to produce space heat and/or hot water. Natural gas is generally a less expensive fossil fuel for space heat, and wood pellet prices are not always competitive. When natural gas prices are significantly higher than the <https://assignbuster.com/the-history-of-wood-heating-environmental-sciences-essay/>

national average price, wood pellets may be the better alternative. Wood pellet heating systems are also a viable option for new construction in the home sector provided the house is large. The wood pellet industry in Ireland is expanding all the time and the case for installation is worthy of examination by anyone considering converting or building a new home.

## **Electric Heating**

Despite the limitations and the fact that in Ireland there is a virtual monopoly in supply via the ESB, electric heating is a viable alternative to consider when planning the heating of your home in a new build situation. The efficiency of electric heating equipment is measured in a couple of different formats, the most common being Coefficient of Performance (COP). A COP of 1.0 means that the heat energy the appliance delivers is the same as the electrical energy it uses. In other words, it operates at 100 per cent efficiency. As an example, consider a baseboard electric resistance heater, which uses electricity to generate heat just as a toaster generates heat. This conversion of electricity to heat is virtually 100% efficient and is said to have a COP of 1. Ground source heat pumps can have a COP of 3. Despite their high efficiency, electric heating units—at current prices of electricity—may cost more to operate than oil, natural gas, or propane boilers. Energy- and cost-saving options are available, however, that may make electric heating cost competitive. For example, the ESB offer a discount rate to customers willing to have a portion of their power cut off during periods of high demand, usually somewhere between 8 a. m. and 8 p. m. daily. To qualify for these rates usually requires having a back-up fuel source or a thermal storage system. A back-up fuel source such as fuel oil or propane can be

used when electricity is interrupted. The main considerations are availability and cost of the back-up fuel as well as how the heat would be distributed throughout the house. Under this agreement, the customer's power may be interrupted any time the utility experiences a high demand for power.

In a price sensitive situation, baseboard resistance heaters are the least expensive to install, but they are the most expensive to operate. They usually do not allow you to take advantage of special low electric rates, since they lack the capacity to store heat. Electric boilers, in addition to supplying heat, also allow air conditioning to be added, and some models can accommodate thermal storage devices. Since electric boilers can lose a significant amount of heat through the seams in ductwork, make sure these points are well sealed. Both electric furnaces and baseboard heaters have a COP of 1, meaning they operate at 100% efficiency. Radiant heating, using electric heating cables, is now more often installed in floors rather than in ceiling or wall panels, as was done in the past. Under-floor radiant heating also can be provided by water, heated by a boiler or ground source heat pump. The heated water circulates through plastic tubing fastened beneath a wood floor, in a cement floor, or in a lightweight cement overlay on an existing floor. In-floor radiant heating provides more constant heat than baseboard heaters. It is most easily installed during new construction or major remodeling and is appropriate for energy saving zoned heating. Electric thermal storage systems (ETS), more commonly known in Ireland as storage heaters, operate by storing heat during the utility's off-peak hours, allowing homeowners to substantially reduce their heating costs by taking advantage of off peak discount rates. ETS boilers use either ceramic bricks or

water to store heat and are available as a central boiler or room heater. If you are building a home, you can bury heating cables in sand or earth beneath concrete slab floors; however, if you choose this method you must insulate under the cables or you will lose a large amount of heat to the ground. There is no doubt that electric heating is worthy of consideration by anybody building a home in Ireland. Together with gas, electric heating is particularly common in Dublin and major towns throughout Ireland in apartment complexes. It is very clean and safe and allows for installation in an existing building without massive interruption to the home. The down side is that one is dependant on the ESB to provide the power and if there is power cut and or a strike, for example, then you are left high and dry unless you have a back-up system such as solid fuel/gas in its place.

## **Heating Your Home**

So you have decided to build your dream home add the all wanted extension or embarked upon a renovation, but are confused with how to heat it, one could not blame you with the many heating and appliance options available on Today's market. One could almost write a book on how to do so and has been done in the past so here are some helpful information and tips to help you make that all important decision. The heating industry is certainly changing with an increasing move towards energy efficient and environmentally friendly products. The emphasis is on efficiency particularly with the new energy rating of new homes. So if your building to meet the highest rating you certainly must plan ahead as there are many certain criteria to meet. The biggest tip I will give you is to plan ahead its never too early to start looking for ideas, however don't get too bogged down on all

these energy efficiency products as it can some times lead to information overload, keep it simple, the first major decision is to decide on a heating system. Will I go with rads or underfloor, well it's up to you as I think its lifestyle and budget that will determine this. So how will I power my heating system, will I use oil, gas, geothermal pump or pellets. Oil for many people still remains the most popular choice particularly in rural parts, however when choosing a boiler it should be a condensing boiler where the efficiency is increased and will pay back in a short number of years. Gas boiler are all now condensing and extremely efficient and clean, those who are on the main gas lined benefit from this if you choose bulk gas it can be expensive to run. Boilers can be located anywhere as they now all available on balance flue with most opting for back kitchen or garage, the garage is a wise choice as this would allow you to change to possible pellets should oil price increase or become scarce. All houses should be zoned separately for water and if 2 story or dormer 2 zones should be created one for up stairs and one for downstairs giving you more flexibility. Water can be heated using you boiler alternatively using an emersion, or solar panels or possibly a boiler stove as back up. Geothermal has made a major impact, although the initial outlay is expensive give that it is best used with under floor. It is a move away from oil. Key points if choosing geothermal is the site suitability and size of house, many companies provides site surveys to determine suitability. Pellets has been the buzz word of the last couple of years, however sine then it seems to have declined. The most important aspect with pellets its there quality and storage they should be purchased in large quantities to make savings.

The government grant certainly helps with a generous allowance for pellet stoves and boilers why the grant does not cover basic issues such as <https://assignbuster.com/the-history-of-wood-heating-environmental-sciences-essay/>

insulation and stoves. Solar has become increasingly popular in new homes given that the sun is free, most solar panels are capable of generating most of the hot water for a new home one should note the panels location and size so do shop around and seek professional advise,. Solar panel will get more advanced and increase in popularity whiles in Spain in present its mandatory to install one in a new build. Should you not decide to use your solar panels your boiler or emersion will adequately heat your homes water, while back boiler from stoves and range cookers can also be linked in to heat water. However in light of all this pellets do offer much the choice to move away from oil in times of rising fuel costs. Pellets are certainly an issue which could be discussed further. When choosing a heating system take into account Budget, lifestyle and size of house being constructed and also other methods of heating you may be including. The simple fact remains that the simplest means of heating a home is good insulation and remember no heat is free. So you have now decided on what heating system to use so what's next? Chimneys or flues are incredibly important in a new home good design will ensure correct performance, so it's important to plan early. So if your not sure what size opening to leave or what appliance or fire to choose, leave a larger opening it can always be made smaller. Too many people leave a small opening this limits your choice of products to choose from. By leaving a larger opening it allows you space to possibly install stove range or insert. Flue and chimney location are important, a low or poorly located chimney may cause problems in the future so plan ahead and seek advice before you build them. Should no chimney exits what are your options, if your choice is a solid fuel or oil stove a insulated steel flue will be required, location is important as it must clear apex of roof (see detailed information on flues).

<https://assignbuster.com/the-history-of-wood-heating-environmental-sciences-essay/>

Alternative options include balance flue gas fires and stoves very popular option or flue less gas fires, although the latter needs no flue at all, ventilation is important with board gas recommending that 2 room vent must be used. Electric is quiet popular, however it is limited to a 2kw output and the flame picture would not be as good as gas, however they are improving them. The open fire for may still remains popular, put in today's more energy efficient society the open fire is not so environmentally friendly while as much as 80% of heat can be lost up a flue and also if the fires is not in use a open fire is like a big hole in the wall letting large amounts of cold air in to your room. Alternative options include a stove or insert (explained later in article) Double sided or featured fires are one of the most sought after items in a new build, however plan ahead as different appliances have different requirements remember always look at the efficiency of the appliance while it may look nice it could be expensive to run. With such a wide variety of appliances available in many different styles and shapes from traditional to contemporary cool. The following will hopefully help you may that all important decision.

- What size room do I need to heat? What output will I require? A simple solution to this it to multiply your room size in metres by width height length and divide by 10 this will give you KW output required to heat the room however do take into account other heating sources in the room
- Do I want to heat water?
- What fuel will I use? Lifestyle or fuel availability will determine this
- What other heating system will be in the room?
- Do I need it for look or do I require heat?
- Do I need it for cooking?



## **Appliances explained:**

### **Range Cookers:**

Range cookers are available in oil/Gas/ Solid Fuel/ Electric and dual Fuel (Gas Hob & Electric ovens) There are 2 types of oil and gas range cookers.

Pressure cookers - designed for full central heating and cooking. They have a separate burner for cooking and water heating while being quiet flexible they do make a little noise and do require an electrical source. Also take note of size of heat required as they do have a limited output, particularly if it's a large home. An electric or gas hob and cooker would be required for additional cooking. The other type of cooker is a continuous vaporising cooker designed for larger kitchens; they do suit people who are generally around the kitchen. They are designed for continuous heat and are also capable of hot water only not rads so take note. The cookers should be run 24/7 and not turned on/off frequently their main advantage is they don't make noise and don't require electricity to work however rising oil & gas make them a little more expensive to run than in the past. Solid fuel range cookers have made a big come back in recent years, certainly to rising oil prices, however remember going for solid fuel is fine but it only saves money if you have a good fuel source Timber or Turf, buying coal can be as expensive as oil as oil rises in price so does coal and other fuels. Solid fuel cookers are capable of being linked into central heating system and heating water and anything up to 12 rads. There are any models available so look early as flue location can be on different sides on different cookers. Electric cookers come in 2 forms those that produce heat similar to oil vaporising cookers (Aga 13amp) or those that look like a range cooker but have an

electric hob and electric ovens (Esse). Dual Fuel Cookers normally come with a gas hob and electric ovens although many cookers now have the options of electric hob or gas with a chef top. They come in a variety of sizes and shapes and colours so let your kitchen maker know early. Although they don't produce heat they have everything you possibly need for cooking and are ideal if another heat source is in your kitchen/living space. No chimney is required but you will need an extractor hood. Important things to note is the cookers efficiency rating as most appliances should have an A if not AA rating.

### **Stoves:**

The once humble stove has become very popular in new build in no small matter to there efficiency and the vast array of styles and shapes they are available in. Stoves are available in oil gas and electric and pellets. They range from small 5kw to larger designer stoves important issues when choosing as stove or planning to install one is chimney. Chimney opening is critical as mentioned earlier too small opening will limit your options. We would recommend leaving oil line and electrical source at chimney as this allows you the option of changing; also recommend leaving ½" gas supply also this will ensure correct pressure to appliance. Oil and gas stoves do offer convenience with no noise and no electricity while working. The gas does offer a better flame picture and can be turned on off more frequently while the oil is designed to be used for longer time but oil is cheaper to run than bottled gas. Oil is good at heating a larger open space particularly if you don't have an adequate supply of solid fuel. Solid fuel stoves are available in a variety of shapes and styles and there is something to suit every budget

and taste so shop around. Solid fuel stoves like ranges are capable of heating water and rads. Remember if deciding to this locate hot water cylinder as close as possible. If choosing a boiler stove you must remember that boiler stoves loose heat in room where being installed so it's a very large room think twice. While there is some beast of boiler stoves on the market be realistic and possibly take the downstairs zone of rads and do them well while suing your boiler as back up. Solid fuel stoves can be linked into under floor although its much harder to control as underfloor works on an even temperature and the large amount of pipes it take longer to heat. When choosing a stove take into account the size of room and of course look at its efficiency how clean it burns and quality and availability of spare parts should you require them in future.

### **Inserts:**

Inserts o whole in wall type fires are available in solid fuel and gas. Do plan ahead as chimney opening is a critical element. As many of these inserts can allow you to take hot air vents to the same room or other room so adequate space is required for this. They do come in various outputs so pick one that suits size of room and your own personnel taste. The gas fire are available in numerous styles with different fuel effects the glass fronted fire are more efficient so always check the gas input and efficiency as mentioned eerier some fires look nice but can work out expensive to run If no flue exists the gas balance flue or electric are popular. The electric are quiet easy to use simple plug in and turn on with the majority now using a remote as standard. In summary this article is intended to give you some helpful hints and advise in building your home and choosing an appliance to suit your needs.

Although we could have gone into more detail the above I hope will give you some all important information. Remember it's never too early to plan ahead and research well. Cover all options and remember efficiency is the key.