

Greener Homes Scheme Phase III

(Existing Dwellings)

Application Guide

Version 3.0

IMPORTANT NOTICE

It is the responsibility of each applicant to the Greener Homes Scheme to ensure that they have read, and fully understand, this Application Guide and the Home Owner Application Form before submitting a signed application form. Failure to fully adhere to the provisions of this Application Guide and the Application Form will result in application refusal, grant revocation or payment request refusal, depending on the particular status and stage of the grant. SEI accepts no liability or responsibility, whether for breach of contract, negligence or otherwise, in respect of any claim or cause of action arising out of, or in relation to, any equipment, product, work, system or installation in respect of which grant approval was given by SEI.

This Application Guide will be revised periodically. Call the Helpline 1850 734 734 or check the SEI website (www.sei.ie/greenerhomes) to ensure that you have the latest version.

Table of Contents

1	Description of Scheme	3
1.1	Using Renewable Energy for Heating.....	3
1.2	Will a renewable energy heating system save me money?	3
1.3	Why offer a grant?	3
2	Scheme Objectives	4
3	Who Can Avail of the Scheme?	4
4	What Products are Eligible?	4
4.1	Biomass System Requirements	4
4.2	Solar Thermal System Requirements	5
4.3	Heat Pump System Requirements	5
5	What Level of Funding is Available?	5
6	Installers	6
7	Approval Criteria.....	7
8	Application and Approval Procedure	7
9	Payment Procedure	7
10	Installation Inspections	8
11	Terms and Conditions of the Scheme	9
12	Useful Contacts	10
13	Appendix A – Practical Guidelines for Buyers	11
14	Appendix B – Technology Descriptions.....	13
15	Appendix C – Useful Publications	18
16	Appendix D – Registered Installer Terms & Conditions.....	19

1 Description of Scheme

The Greener Homes Scheme Phase III (the “Scheme”) provides assistance to homeowners who intend to purchase a new renewable energy heating system for existing homes. The scheme is administered by Sustainable Energy Ireland (“SEI”) and aims to increase the use of renewable energy and sustainable energy technologies in Irish homes.

1.1 Using Renewable Energy for Heating

We, in Ireland are heavily reliant on fossil fuels which are a limited resource, cause emissions that are harmful to the environment and can be subject to volatility of price and availability. The Irish Government wishes to reduce this reliance and move towards making greater use of our renewable energy resources. This diversification can be good for the economy because of the longer term availability and constancy of supply and good for the environment through the reduced emissions of Carbon Dioxide (CO₂).

The main sources of renewable energy in Ireland are the sun (solar energy), the wind, moving water (hydropower, wave and tidal energy), geothermal (heat below the earth's surface) and biomass (wood, certain wastes and energy crops). One of the main benefits of using renewable energy is that it reduces emissions of carbon dioxide. Ireland has an abundance of several of these resources and their effective development and use will reduce emissions of harmful greenhouse gases and our reliance on imported fossil fuels.

Homeowners can play their part by choosing a renewable heating system (solar, biomass or heat pump based) that meets their particular needs in terms of heat demand, budget and environmental considerations. Doing so will help Ireland move down a path towards more sustainable energy use, ultimately benefiting the environment.

1.2 Will a renewable energy heating system save me money?

Where a renewable energy technology uses a “free” energy source like sun shine, you no longer have to worry about fuel prices increasing. On the other hand heat pumps require electricity to operate and biomass equipment requires a wood based fuel – so both of these remain vulnerable to fuel / energy price fluctuations.

The guaranteed way to reduce your energy bills is to only generate as much heat as you require, at the time you want it, and to maximise the value of that heat by preserving it within your home. We strongly advise anyone planning to invest in a renewable heat system to investigate all methods of increasing the overall energy efficiency of their homes. Effective wall and attic insulation, good time and temperature controls of your heating and high performance windows will all reduce the heat required to have a warm and comfortable home. Purchasing household electrical equipment with an 'A' energy rating e.g. fridges, freezers, washing machines and light bulbs* reduces electricity consumption. This approach will have a significant impact on your energy bills and will also protect you from any price variation in your primary fuel source.

1.3 Why offer a grant?

Renewable energy heating systems are new technologies which, while proven and highly popular overseas, have yet to become widespread in Ireland. The Irish Government, through SEI, wishes to encourage people to “green” their homes by contributing to the initial investment cost of installing a renewable energy heating system. The government believes that this will help ensure a faster uptake of renewable heating systems which will underpin the development of a long term market, while enabling homeowners to play their part in reducing carbon dioxide emissions.

[*More details of these options are available in a range of SEI Home Energy Guides listed in Appendix C of this Guide].

2 Scheme Objectives

The objectives of the Scheme are:

- To increase the number of households in Ireland that use renewable energy;
- To guide consumers towards discerning choices of Renewable Energy Heating;
- To ensure that the market for the products, services and fuels continues to develop in a robust manner;
- To decrease our reliance on imports of fossil fuels;
- To benefit the environment by reducing the emissions of harmful carbon dioxide

3 Who Can Avail of the Scheme?

The Scheme is open to the following applicants:

- Individuals who are homeowners
- Installing eligible products (see **Section 4** below and Registered Product List) either a new
 - wood chip/pellet boiler or stove w/back-boiler or standalone stove
 - wood gasification boiler
 - solar thermal
 - heat pump based heating system
- Using installers who are registered with SEI (the "Registered Installer List" available on request or on line at www.sei.ie/greenerhomes).
- Individuals intending to retrofit or install a new renewable energy heating system in their **existing** home.

4 What Products are Eligible?

The grants will be provided to homeowners who invest in new renewable energy based heating systems in the following categories:

Solar Heating

- Solar hot water system and / or
- Solar space heating system

Heat Pumps

- Horizontal ground collector
- Vertical ground collector
- Water (well) to water
- Air source

Wood Chip or Pellet Stoves – with or without integral boiler

Wood Chip or Pellet Boilers – with bulk fuel storage installed

Wood Gasification Boiler

An application **MUST INCLUDE** the SEI Product ID found on the Registered Product List. Applications made without the SEI Product ID will be returned to applicant as incomplete. The SEI Registered Product List is available on request or online at www.sei.ie/greenerhomes.

Further details on each of the technologies above are contained in Appendix B to this guide. More detailed technical descriptions and Buyers Guides for the specific products are available on request or online at www.sei.ie/greenerhomes

4.1 Biomass System Requirements

Bulk Fuel Storage: All biomass boiler installations shall require the provision of bulk fuel storage. It shall be required to meet local building and fire regulations. The ONORM M7137 Standard <http://on-norm.at/ecom/> shall be used as a guideline for DIY bulk storage units. Bulk storage capacity shall be able to store a minimum of 3 tonnes of wood pellets (80% of a typical houses' requirement for one year).

Buffer Heat Store: It is a recommendation that a buffer or accumulator tank be incorporated as part of domestic wood pellet / chip boiler system installations where appropriate. A buffer or accumulator cylinder in a domestic biomass heating installation is a primary heat storage/distribution cylinder, which is heated by the boiler to a set temperature and can store the resulting high temperature water for long system standstill periods, until heating or hot water is required. A buffer / accumulator reduces the on/off cycling of wood boilers by “smoothing” the heat output to the dwelling. The buffer or accumulator capacity should be calculated in accordance with your manufacturer’s recommendations. A rough guideline for establishing the volume of the buffer is available from EN303-5 and from the REIA training manual and is in the region of 55 to 65 L/kW of the rated boiler size.

The use of a buffer / accumulator is noteworthy in the following situations:

- Where the boiler does not have full modulation capabilities: the use of a buffer will smooth the heat output to the dwelling.
- In situations where the boiler is not capable of supplying the full heat demand of the house, a buffer tank will allow the boiler to run for longer at optimum efficiency extracting maximum potential from the boiler and fuel.

4.2 Wood Gasification Boiler Requirements

A buffer store (accumulator) will be installed in conjunction with your wood gasification boiler to ensure the efficient operation of your boiler. Buffer stores are important heat storage devices, especially for wood gasification boilers. These boilers can only be operated efficiently when combined with an accumulator since controlled operation at part load is more difficult. A buffer or accumulator cylinder in a domestic biomass heating installation is a primary heat storage/distribution device, which is heated by the boiler to a set temperature and can store the resulting high temperature water for long system standstill periods, until heating or hot water is required. The buffer or accumulator capacity should be calculated in accordance with your manufacturer’s recommendations. A rough guideline for establishing the volume of the buffer is available from EN303-5 and from the REIA training manual and is in the region of 55 to 65 L/kW of the rated boiler size.

4.3 Solar Thermal System Requirements

The maximum aperture area supported is 6m² for both flat plate and evacuated tube panels. The following recommendations are made regarding the sizing of the hot water cylinder based on maximum cylinder temperature;

- At 60°C use a minimum of 70 litres per m².
- At 85°C use a minimum of 50 litres per m².

4.4 Heat Pump System Requirements

When installing a heat pump into an existing dwelling it is critical to ensure that the building is sufficiently insulated and the existing heating system is surveyed for compatibility. In many cases the dwelling’s fabric will need to be upgraded to ensure efficient operation and thus optimal electricity cost. It is recommended to try and achieve insulation levels as close to “new build” requirements, where possible and practical. Recommended values for average elemental U-value for insulation would be:

• Roofs	0.16 W/m ² K
• Walls	0.27 W/m ² K
• Ground Floors	0.25 W/m ² K
• Exposed Floors	0.25 W/m ² K
• External doors/windows/roof-lights:	2.0 W/m ² K

For more information in regard to achieving good insulation levels, please consult the relevant SEI publications, in particular the following: [What is a U-value](#), [the Detailed Guide to Insulating Your Home](#) and [Renovating and Older Home](#) .

The existing heating system should be surveyed by your installer as not all radiators are suitable for use with heat pumps. In new build it is common for heatpumps to be used in conjunction with Underfloor Heating, however this may not be practical in existing buildings, due to the need for

high levels of insulation (U-values = 0.15 W/m²/K) and the likely requirement to replace / renovate the existing floor. An alternative to consider is low temperature radiators, which are particularly suited to heatpumps.

ESB Networks are now requiring that a soft starter be incorporated in heat pump installations in houses. Please contact ESB Networks before you apply to ensure that a sufficient electricity connection can be provided.

5 What Level of Funding is Available?

The levels of grant support available for each technology are as follows:

Technology Maximum Grant	
Biomass - Boiler	€2,500
Biomass - Stove	€800
Biomass - Stove w/ Integral Back Boiler	€1,400
Heat Pump – Vertical Ground	€3,500
Heat Pump – Horizontal Ground	€2,500
Heat Pump - Water to water	€2,500
Heat Pump - Air Source	€2,000
Solar - Flat Plate	€250/ m ² (to max. of 6m ²)
Solar - Evacuated Tube	€300/ m ² (to max. of 6m ²)
Wood Gasification Boiler	€2,000

Please note only one grant will be provided per dwelling under Phase III and where a dwelling had an installation funded under Phase I or Phase II, that dwelling will not be eligible for further grant aid under the Scheme.

6 Installers

Applicants must use installers who have registered with SEI and that installer must be registered at the time of application **and** at time of system commissioning. Applicants who wish to install a wood gasification boiler must use an installer that is registered on the **Wood Gasification Boiler Registered Installer List**. Installers wishing to register under Phase III of the Scheme are required to achieve accredited qualifications in their relevant technology. Verification of an installer's qualifications is a matter for each applicant. Please see the Appendix D for the terms and conditions for installers to register under the scheme.

NOTE: An application **MUST INCLUDE** Installer ID found on the Registered List of Installers. Applications made without the SEI Installer ID will be returned to applicant as incomplete. The Registered Installer Lists are available on request or online at www.sei.ie/greenerhomes.

7 Approval Criteria

The following conditions will apply in the approval of grant applications and all conditions must be met in advance of any approval of a grant.

1. Applicant must be the homeowner and must have full possession of the property where the system is to be installed
2. Applicant must fully complete the Greener Homes Application Form (the "Application Form") with information valid at time of application
3. Applicant must supply bank account and sort code details to facilitate electronic payment of the grant. (Please note that currently we cannot process EBS and Credit Union accounts)
4. Applicant must agree to be bound by the Terms and Conditions of the Scheme (see **Section 11** below)
5. Product must be listed, at the date of application, on the Registered Product List (available on request or online at www.sei.ie/greenerhomes)
6. Installer must be listed, at the date of application **and** on the date of system commissioning, on the Registered Installer List
7. SEI must still have adequate funding available to it pursuant to the relevant phase of the Scheme in order to be able to approve the relevant application.

8 Application and Approval Procedure

Application should be made on the Scheme Application Form (available on request or online at www.sei.ie/greenerhomes) and sent to:

Greener Homes Scheme
Sustainable Energy Ireland
Glasnevin
Dublin 9

Once a completed application form has been received it will be considered for approval by SEI against the above Approval Criteria (see **Section 7** above). Please allow a minimum of twenty one days for processing of your application. If approved, a Letter of Offer will be issued to the applicant. The offer will only be validated upon the applicant indicating the applicant's acceptance of offer by returning a signed copy of the Letter of Offer to SEI, which must be received within 30 days of date of issue.

The grant offer remains valid for 12 months from the date of issue of the Letter of Offer. The offer will automatically lapse after this date if a valid request for payment form (RFP) with all appropriate supporting documentation has not been received by SEI.

9 Payment Procedure

Upon completion of the installation, and payment having been made in respect of the supply and installation of the equipment, the applicant must make a formal request to SEI for payment comprising the following:

1. Completed Request for Payment Form (which will be issued with the Letter of Offer at time of grant approval)
2. Invoice and receipt of payment to installer separately detailing full cost of equipment and installation* (in instances where the total amount paid is less than the grant approved then the lesser amount will be paid)
3. Completed Standard Commissioning Report signed by the registered installer

***Note:** If equipment was purchased separately, please provide separate invoices and receipts for payment of full equipment cost and installation charges.

Once all documentation is in order and acceptable, and, if selected, a satisfactory inspection completed (see **Section 10**), the grant will be paid electronically to the applicant's bank account and an accompanying letter notifying payment will be sent to the applicant. SEI will endeavour to make payment within eight weeks of receipt of completed and acceptable payment

documentation. However applicants should be aware that the timing of payments is subject to the availability of funds to SEI in any calendar year.

10 Installation Inspections

All completed installations may be the subject of verification and/or technical inspections. Properties may be the subject of a sampling process and homeowners will be notified by SEI prior to the inspection.

In the case of **Verification Inspections** the inspection will precede payment of the grant. This inspection will be scheduled at the earliest possible opportunity by SEI's appointed inspector in consultation with the homeowner. Grant payment will be made upon satisfactory receipt of the verification inspection report from the inspector.

Technical Inspections on the other hand will take place once installation is completed, and will be scheduled for an appropriate time thereafter, and will not delay payment. The report of the inspector will be used by SEI in order to inform ongoing development of quality assurance within the Scheme.

11 Terms and Conditions of the Scheme

1. The Application Guide, Application Form and Terms and Conditions are those published on the SEI website on the date of submitting the application. However, SEI may, if required by law and without incurring any liability, vary, revise or supplement the Terms and Conditions of the Scheme after the applicant's submission of an application and these revised or supplemented Terms and Conditions may apply to the application unless the applicant chooses to withdraw its application.
2. The applicant's agreement with SEI in the event of a Letter of Offer being signed will comprise the Terms and Conditions, the Application Guide (including its Appendices), the Applicant Declaration in the Application Form and the rest of the Application Form. The applicant shall comply with and agrees to be bound by the provisions of these documents. In the event of any conflict arising between these documents the order of precedence shall be:
 - (i) the Terms and Conditions of the Scheme;
 - (ii) the Applicant Declaration in the Application Form;
 - (iii) the rest of the Application Guide less the Terms and Conditions of the Scheme; and
 - (iv) the rest of the Application Form less the Terms and Conditions of the Scheme and less the Applicant Declaration.
3. The applicant must ensure that he/she completes and submits, to the extent applicable, the latest version of the Application Form (see www.sei.ie/greenerhomes for the latest version)
4. The applicant must be the owner of an existing home, located in the Republic of Ireland, in respect of which the grant application is made (not applicable to mobile homes, caravans, houseboats or other temporary dwellings). Only existing dwellings are supported.
 - An existing dwelling has been occupied for a minimum of one year
 - An existing dwelling has an existing heating system
 - SEI's QA programme involves site visits at which time the stated age of the house can be verified
 - The installing engineer is required to vouch for the age of the house at time of commissioning
5. The applicant must install a new product identified in the product types and listed on the Registered Product List (see **Section 4** of the Application Guide).
6. The applicant must engage an installer listed on the Registered Installer List (see **Section 6** of the Application Guide).
7. Approval of the grant only becomes valid upon receipt by SEI of the issued Letter of Offer signed by the applicant indicating his/her acceptance.
8. The applicant must secure approval from SEI before assuming he/she will receive the grant. SEI reserves the right to reject/approve applications for grants under the Scheme
9. The applicant must ensure grant approval is received before proceeding with any product purchase or installation work;
10. The grant, once approved, is only payable in respect of the type of product and installer identified in the Application Form and referenced in the Letter of Offer.
11. The timing of payment to approved applicants is subject to the funding allocated to the Scheme / programme in a particular calendar year, in accordance with public financial procedures. Where all other conditions are met, payment will be made by SEI on a "first come, first served" basis. Where funding is exhausted in a particular calendar year, payment to remaining applicants will be deferred until such time as further funds are available. Deferred payments will receive priority, if and when those funds become available.
12. Should his/her property be selected as part of a sample inspection process, the applicant must make his/her home available for verification and/or technical inspection. The applicant consents to the results of such inspections being published by SEI and made available to the public in whatever media SEI may, at its discretion, choose. The applicant must also be prepared to participate in follow-up research

(telephone or postal questionnaire) as may be commissioned by SEI to establish the Scheme's impacts and achievements. The applicant acknowledges that SEI will have to provide certain contact details to third party contractors in relation to these matters.

13. The applicant must obtain all necessary consents, permissions and statutory approvals and have authority to install the technology in his/her home.
14. SEI accepts no liability or responsibility, whether for breach of contract, negligence or otherwise, in respect of any dispute, claim or cause of action arising out of, or in relation to, any product (or its suitability), equipment (or its suitability), work, system, service, specification, standard, installation or the qualification or performance of the installer in respect of which grant approval or payment was given by SEI. No undertaking, guarantee, assurance or other warranty, express or implied, is given by SEI, or any of its agents or servants, in respect of the cost, quality, efficiency and/or benefit of any work, equipment, product, service or installation provided under the Scheme. The fact of registration on the Registered Product List or the Registered Installer List for the Scheme does not infer any warranty or endorsement of that product or installer by SEI.
15. The information provided herein and on SEI's website is provided solely for the purpose of providing assistance to the public, and is not intended to warrant or guarantee the quality of the product and/or the installation chosen by the grant applicant.
16. In the event of any breach of these Terms and Conditions of the Scheme or the other documents referred to in section 2 above by the applicant and where the applicant has received payment pursuant to the Scheme, SEI shall, amongst its remedies against the applicant, be entitled to demand the complete repayment of the grant payment and the applicant agrees to comply with any such demand within one month of the date of the letter from SEI containing such demand.
17. The applicant shall follow the SEI complaints procedure in relation to any disputes between the applicant and SEI concerning any matter in connection with the Scheme.

12 Useful Contacts

Scheme Administrator

Adeline Carpenter
Greener Homes Scheme
Sustainable Energy Ireland
Glasnevin
Dublin 9

Phone 1850 734 734
Fax 01 808 2013
Email greenerhomes@sei.ie

This document together with the necessary forms may be downloaded from SEI's website www.sei.ie/greenerhomes

13 Appendix A – Practical Guidelines for Buyers

A decision to install a renewable energy heating system involves a major investment. This is a new technology area and you should ensure that you are fully informed and proceed carefully to ensure that you get a system that truly meets your requirements and expectations.

Whether you have only just begun to consider a renewable energy heating system, or even if you are nearly settled on your preferred system, these basic guidelines represent good practice in the selection of the system. Ultimately the decision rests with you the customer and the basis for the installation of the system should be recorded in some form of written contract between you and your chosen installer.

The installation of certain products may constitute ‘works’ or ‘development’ within the meaning of planning legislation and/or building regulations. You should ensure that you have relevant, permissions, consents and approvals in place before works commence. Your installer is required to comply with Irish building regulations and technical regulations some of which are available for consideration on the Department of the Environment’s website (at www.environ.ie).

More detailed guidance on particular systems is available in the technology specific Buyers Guides available on request (e-mail: greenerhomes@sei.ie or Lo Call 1850 734 734) or on line at www.sei.ie/greenerhomes

Choosing Your System

You need to be fully confident that the system you select will meet the heating needs of your home in an efficient and effective manner and is within your budget. The design of that system is best done by an appropriately skilled or experienced installer.

Getting the Best Option

Shop around. Before settling on any one product type, or installer, get at least two quotes for the equipment and installation, more if desired, and compare the offerings. You might also ask for quotes on likely running costs in terms of cost per unit of energy delivered. If you have decided on a particular product/system, but remain uncertain about the installer, then contact the manufacturer/supplier directly and ask them if they can recommend an installer to you.

Check References

While comparing the quotes that you have received, and before you make any final decision, request the prospective installers to provide reference homes where they have installed your chosen system or similar systems. Contact the references supplied (again try for two or more):

- ask if the job came in on time and on price
- confirm that they are fully satisfied with the system
- check that it is operating correctly
- check that they are satisfied with the standard of workmanship of the installer
- see if there were any issues during or since installation and whether they were resolved to the client’s satisfaction
- ask about the scope and quality of their after sales service.

It will always be worth visiting one of these homes to see the product in operation and to satisfy you of the workmanship firsthand.

Formalise the Relationship

As stated, the contract for the purchase and installation of the product will be between you the customer and your chosen installer (and possibly the supplier). This is best done through the use of a written contract that records the following aspects of the agreement:

- obligations of the installer / supplier in the installation of the product
- your duties in terms of facilitating the installation
- payment terms and milestones
- obligation of installer / supplier to effect and maintain appropriate levels of professional liability insurance such as contractor's all risk insurance or professional indemnity insurance from the date of commencing installation works until the end of a period of 6 years from the date of completion of the installation
- agreed terms for dispute resolution should problems arise before, during or after the installation has been completed

In short, the decision is with you, the customer. The contract is between you and the installer. The warranty and aftercare responsibility of the product and installation should rest with the installer and /or the supplier/manufacture as appropriate.

SEI Can Help

SEI has a range of support information to assist you in your decision, including the following:

Product Overviews

- Give you the buyer, details as to how the technology works and what it can be expected to deliver

Product Buyers Guides

- These provide more detailed guidance on a range of questions you should ask your installer to address satisfactorily before you come to any decision

Registered Product Lists

- Lists of products which have been identified to us for the Scheme (see **Section 4** above)

Registered Installer Lists

- Lists of installers who are currently on the Registered Installer List (see **Section 6** above)

A Model Contract

- A model written contract which may, depending on your circumstances, be suitable to use as a basis for agreeing a contract with your chosen installer/supplier, or as a template for you to assess your chosen installer's/supplier's own terms and conditions. However, should you remain uncertain, you may wish to seek legal advice in the formalising of the contract.

The above information and resources are all available online at www.sei.ie/greenerhomes

The above Information is supplied as advice only in order to assist grant applicants in their decision and in an effort to ensure that the grant applicant gets the most appropriate technology supplied and fitted in a professional manner.

14 Appendix B – Technology Descriptions

14.1 Solar

Solar Panels, also known as "collectors", can be fitted to a building's roof. They use the sun's heat to warm water, or another fluid, which passes through the panel. The fluid is then fed to a heat store (e.g. a hot water tank) and helps provide hot water or a source of hot water for central heating for the building. Solar panels work throughout daylight hours, even if the sky is overcast and there is no direct sunshine. Solar panels can also be used to contribute to space heating demand. The cost of a professionally installed solar system for heating hot water can vary greatly. If you are considering investing in this technology you should do sufficient research to ensure that you are getting the best system for your needs and value for your money.

Location - The optimum location for solar panel collectors for all year round energy collection is roughly south facing and at a tilt angle of 30°- 45° to the horizontal (however angles between 15° and 60° are also acceptable). It is also important that the collectors are positioned so there are no shadows on them during the middle of the day. Shading can be from the collectors themselves, or from trees, chimneys, part of the building or adjacent buildings.

Cylinder – An appropriately sized cylinder should be chosen for the house. The volume of your solar hot water cylinder is related to the maximum cylinder temperature. It is recommended that at a maximum cylinder temperature of 60°C, 70 litres per square metre of aperture area is supplied and at a maximum cylinder temperature of 80 – 90 °C, 50 litres per square metre of aperture area is supplied. Smaller capacities will limit the benefit from the system and may lead to frequent overheating of the solar circuit. Generally Dual Coil cylinders should be used, having the coils at the top and bottom of the cylinder. The solar collector circuit should be connected to the bottom coil and the auxiliary circuit to the top coil, which will enable the solar system to pre-heat in bad weather. Your installer will be able to help you choose an appropriately sized cylinder.

Thermal Mixing Valve (Anti-Scald Valve) - Best practice calls for the fitting of a thermal mixing (anti-scald) valve. This applies to all hot water systems and not just solar heated water systems. With the current recommendation to store hot water at 60°C to prevent the growth of legionella bacteria it is becoming more of a consideration to install thermal mixing valves. A thermal mixing valve mixes cold and hot water together to ensure the water temperature is safe for people to use.

Controller – After commissioning, a permanent power supply should be provided for the solar controller to ensure circulation in the solar loop.

A solar water heater is composed of:

- A solar collector (flat plate or evacuated tube) which absorbs solar radiation (sunlight) and changes it into heat;
- A pump which transfers the heat from the collector to hot water in a storage tank;
- The storage tank accumulates the hot water produced by solar energy so that it can be stored for use when needed;
- A number of accessories which ensure the regulation and the safety of the system;
- A back-up heater (gas, oil, or wood fuelled boiler, immersion heater or heat pump) which will bring the hot water to the temperature required when there is not enough sunlight to do so (mostly in winter).
- In Ireland, solar collectors alone cannot provide all the hot water for a household's needs throughout the year. Correctly sized they will supply 60% of heat / domestic hot water needs. They are normally installed in conjunction with a conventional back-up heating system.

Planning Permission for Solar Panels

The installation of solar panels in your home is exempt from planning permission up to 12m² or 50% of the total roof area as per Statutory Instrument No. 83 of 2007 Planning and Development Regulations <http://www.environ.ie/en/Publications/DevelopmentandHousing/Planning/FileDownload.1486.en.pdf> implemented on the 28th February 2007. Contact your local planning authority if you are unsure of the local planning requirements.

14.2 Heat Pumps

Heat is widely available in the ground, air and water around your house. These natural sources of heat are constantly replenished by the sun, wind and rain. A heat pump system will harness these free and renewable energy sources for heating your house and supplying hot water at a very low cost. The role of the heat pump is to 'pump up' heat from a low temperature source, for example the ground under your lawn and release it at a higher temperature into your central heating system. There are three main types of heat pump available on the market, those that take heat from the ground, from water (rivers or wells) or directly from the air. Ground source heat pumps come in two varieties – vertical bore or horizontal loop.

Existing Dwellings Note

When installing a heat pump into an existing dwelling it is critical to ensure that the building is **sufficiently insulated** and the **existing heating system is surveyed** for compatibility. Many times the dwelling's fabric will need to be upgraded to ensure efficient operation and thus optimal electricity cost. Recommended values of average elemental U-value for insulation would be:

- Roofs: 0.3 W/m²K
- Walls: 0.6 W/m²K
- Ground Floors: 0.6 W/m²K
- Exposed Floors: 0.6 W/m²K
- External doors windows/roof-lights: 2.6 W/m²K

The existing heating system should be surveyed by your installer as not all radiators are suitable for use with heat pumps; it is recommend that Underfloor Heating (with sufficient insulation) or low temperature radiators are used.

Heat pumps are very economical, for every unit of electricity used to power the heat pump, 3 to 4 units of heat are generated. They work best in conjunction with low temperature heat distribution systems e.g. underfloor heating. Because they require electricity to run, they are most cost effective when they can use night rate electricity. This requires a night rate meter. A buffer store is required to maximise efficiency as this allows the heat pump to store heat on a constant basis, releasing it as and when required.

Ground Source Collector - This collector is used in closed loop systems to transfer the heat from the ground to the house. The design and installation of this collector is important and your installer will be able to explain all the relevant aspects of it. It is important not to landscape or plant any trees or shrubs in the vicinity of the collector area as the roots can interfere with the operation of the heat pump. It is important that you take care to note a number of things:

- Your installer will provide a **plan** of the site showing the collector area and depth. This could prevent damage to the collector if any future work or landscaping is carried out on the grounds. In addition photographs of the collector before it is covered up would be helpful with any future work or trouble-shooting of the heat pump system.
- **Collector calculations** – Your supplier/installer will carry out tests on the soil to ensure that the most suitable collector (vertical, horizontal) will be chosen. They will provide a formal set of calculations for the collector design which will aid any future trouble-shooting.

Air-Source Heat Pump - Air/Air heat pumps take the energy from the air and transfer it to a warm air heating system and Air/Water heat pumps take the energy from the air and transfer it to the water in a heating system.

Water –Source Heat Pump - Water source heat pumps work in a similar fashion to ground source systems and transfer the heat from your water source to the house. Water source heat pumps use an open loop collector. Underground water sources such as a well circulate the water through pipework that in turn transfer heat to your house.

A Piping Schematic, Valve Chart and Wiring Diagram– Your installer will provide you with a piping schematic, valve chart and wiring diagram. This will be very useful in helping with any future work or trouble-shooting of the heat pump system.

Under Floor Heating System Design – You should discuss the under floor heating system and any plans for floor coverings with your installer as they affect the heat transfer from the floor and the overall operation of the system. Again, photographs of the under floor piping system during the installation would be helpful with any future trouble-shooting.

NB for the most efficient and economical operation of your system, it is important that your installer is involved (or well informed) in the above 3 points.

14.3 Wood Chip or Pellet Stoves

Everyone loves a wood fire; it really turns a house into a home. But open fires and old-fashioned stoves can be polluting, inefficient (typically only 20-30% efficient) and inconvenient. Modern wood pellet stoves offer the warmth and comfort of wood heating while being highly efficient, clean burning and totally automatic, saving you time and money.

Wood burning systems do emit carbon dioxide. However, as the wood fuel is cultivated, it absorbs the exact same amount of carbon dioxide as is released when burnt. As such it does not add to the carbon dioxide in the atmosphere. An eligible system can be used for heating a single room, hot water or a whole house.

It is important that there is adequate ventilation and that a clean air source is supplied to the stove, as the combustion process uses oxygen (in the same way as any fuel fired appliance). Given that some stoves come equipped with an integral boiler for hot water and heat delivery, it is important that these systems are correctly integrated with the existing hot water system (e.g. cylinder). (See Part J of the Building Regulations for minimum ventilation requirements – go to www.environ.ie).

14.4 Wood Chip or Pellet Boilers

Modern wood chip or pellet boilers offer the warmth and comfort of wood heating while being highly efficient, clean burning and totally automatic, saving you time and money.

Chip or Pellet boilers are lit automatically and continue to operate without manual intervention. Automatic fuel supply and thermostat means you can relax and enjoy the comfort of chip/pellet heating at the switch of a button. Automatic ignition means that lighting the boiler is convenient and easy. Modern chip/pellet boilers are self cleaning so you can forget the daily cleaning chore of traditional solid fuel heating systems. The ash pan needs to be emptied bi-weekly, or less frequently, depending on service.

These systems must comprise the main heating system of the house and can be run on wood chips and/or wood pellets.

Flues: The flue is used for the exhaust of the boiler or stove. It can be installed through a chimney or outside the building. The flue must be installed to current Building Regulations. (Part J – go to www.environ.ie). Some things to look for would be:

- It is above the eaves line by about 1metre or 600mm if coming out near the roof apex.
- It is twin walled and insulated.
- It has a cowl or hood on top to help prevent down draught.
- It should be separated from any combustible material.

Constructional Hearth: A constructional hearth should be placed (see Part J of the current Building Regulations – go to www.environ.ie) under a stove to separate the stove from combustible material and to provide protection from the threat of fire. The constructional hearth could be a metal or a non-combustible plate. The appliance should not be placed close to the edge of a hearth or any combustible material.

Air Supply: A stove or boiler must have a secure air supply for safe operation (see Part J of the current Building Regulations – go to www.environ.ie). This can be either in the form of a controlled dedicated air supply directly to the appliance, or in the form of a permanent ventilation opening to

the room in which the appliance is located. Best practise is to rely upon dedicated ventilation and **not** on air infiltration and/or leakage in the room. The size of the opening depends on the size of the appliance. Your installer should be able to size this correctly. In addition, extractor fans may interfere with the operation of the appliance causing smoke to spill out of the appliance into the room so please consult with your installer.

Thermal Mixing Valve (Anti Scald Valve): See section 14.1

Bulk Fuel Storage: All biomass boiler installations shall require the provision of bulk fuel storage. It shall be required to meet local building and fire regulations. The ONORM M7137 Standard <http://on-norm.at/ecom/> shall be used as a guideline for DIY bulk storage units. Bulk fuel storage capacity shall be able to store a minimum of 3 tonnes of wood pellets (80% of a typical houses' requirement for one year).

Buffer Heat Store: It is a recommendation that a buffer or accumulator tank be incorporated as part of domestic wood pellet / chip boiler system installations where appropriate. A buffer or accumulator cylinder in a domestic biomass heating installation is a primary heat storage/distribution cylinder, which is heated by the boiler to a set temperature and can store the resulting high temperature water for long system standstill periods, until heating or hot water is required. A buffer / accumulator reduces the on/off cycling of wood boilers by "smoothing" the heat output to the dwelling. The buffer or accumulator capacity should be calculated in accordance with your manufacturer's recommendations. A rough guideline for establishing the volume of the buffer is available from EN303-5 and from the REIA training manual and is in the region of 55 to 65 L/kW of the rated boiler size.

The use of a buffer / accumulator is noteworthy in the following situations:

- Where the boiler does not have full modulation capabilities: the use of a buffer will smooth the heat output to the dwelling.
- In situations where the boiler is not capable of supplying the full heat demand of the house, a buffer tank will allow the boiler to run for longer at optimum efficiency extracting maximum potential from the boiler and fuel.

Thermostats

Thermostats are used to control the temperature of an area or space. You should consider what the optimum location of the thermostat is; usually it is the living space where you will spend most of your time. It is very worthwhile to have all main rooms "zoned" and fitted with their own thermostat.

Pellets

Quality pellets are essential to ensure clean combustion and trouble-free operation of your appliance. When buying pellets, consumers should consider those that are supplied with a quality mark and with a complete fuel analysis. Often this information will be printed on the packaging.

Pellets can be purchased in bagged or bulk form. For bulk purchases, a dry covered storage area is required. Generally bulk prices are more competitive than those for bags. Wood chips are generally sourced locally. It is important that the fuel used (quality, size, moisture content) is suitable for the appliance; your supplier will provide you with these details.

Poor pellet quality can greatly interfere with the functioning of the heating system. There are various European pellet quality standards currently in operation. Some of the more common standards are:

Austria:	ÖNORM M1735
Sweden:	SS 187120 and SS 187121
Germany:	DIN 51731
Europe:	CEN TS 14961

In Canada and the US the equivalent standard is Premium grade.

14.5 Wood Gasification Boiler

A wood gasification boiler is a central heating boiler which produces its useful heat through combustion of wood gas. This “generator” gas is produced by the thermal transformation of wood fuel i.e. the wood fuel is first converted to gas then the resulting charcoal is then also converted to gas.

A wood gasification boiler differs from a standard wood boiler by way of the combustion process. In a standard wood boiler, direct combustion of the wood fuel takes place, whereas in a wood gasification boiler, combustion of wood-gas takes place following thermal conversion of the wood fuel to gas.

Buffer Heat Store

A buffer store (accumulator) will be installed in conjunction with your wood gasification boiler to ensure the efficient operation of your boiler. Buffer stores are important heat storage devices, especially for wood gasification boilers. These boilers can only be operated efficiently when combined with an accumulator since controlled operation at part load is more difficult. This is due to the nature of the fuel (generally wood logs). Once combustion takes place, the fuel will continue to burn irrespective of whether the dwellings heat load is met. Consequently the buffer or accumulator cylinder in a domestic biomass heating installation is the primary heat storage/distribution device, which is heated by the boiler to a set temperature and can store the resulting high temperature water for long system standstill periods, until heating or hot water is required. The buffer or accumulator capacity should be calculated in accordance with your manufacturer’s recommendations. A rough guideline for establishing the volume of the buffer is available from EN303-5 and from the REIA training manual and is in the region of 55 to 65 L/kW of the rated boiler size.

Flues

The flue is used for the exhaust of the boiler or stove. It can be installed through a chimney or outside the building. The flue must be installed to current Building Regulations. (Part J – go to www.environ.ie). Some things to look for would be:

- It is above the eaves line by about 1 metre or 600mm if coming out near the roof apex.
- It is twin walled and insulated.
- It has a cowl or hood on top to help prevent down draught.
- It should be separated from any combustible material.

Constructional Hearth

A constructional hearth should be placed (see Part J of the current Building Regulations – go to www.environ.ie) under a stove to separate the stove from combustible material and to provide protection from the threat of fire. The constructional hearth could be a metal or a non-combustible plate. The appliance should not be placed close to the edge of a hearth or any combustible material.

Air Supply

A stove or boiler must have a secure air supply for safe operation (see Part J of the current Building Regulations – go to www.environ.ie). This can be either in the form of a controlled dedicated air supply directly to the appliance, or in the form of a permanent ventilation opening to the room in which the appliance is located. Best practise is to rely upon dedicated ventilation and **not** on air infiltration and/or leakage in the room. The size of the opening depends on the size of the appliance. Your installer should be able to size this correctly. In addition, extractor fans may interfere with the operation of the appliance causing smoke to spill out of the appliance into the room so please consult with your installer.

Thermal Mixing Valve (Anti Scald Valve): See section 14.1

Thermostats

Thermostats are used to control the temperature of an area or space. You should consider what the optimum location of the thermostat is; usually it is the living space where you will spend most of your time. It is very worthwhile to have all main rooms “zoned” and fitted with their own thermostat.

15 Appendix C – Useful Publications

The following publications from SEI will assist you in your learning and decision making:

Technology descriptions

- Solar Water Heaters
- Solar Space Heating
- Renewable Heat Pumps
- Wood Chip or Pellet Stoves
- Biomass Boiler

Buyers Guides

- Buyers Guides to Solar Water Heaters
- Buyers Guides Solar Space Heating
- Buyers Guides to Renewable Heat Pumps
- Buyers Guides to Wood Chip or Pellet Stoves
- Buyers Guides Wood Chip or Pellet Boilers

Consumer Guides on Renewable Energy and Energy Efficiency

- Consumer Guideline – Biomass Boilers and Stoves
- Consumer Guideline – Solar Thermal Systems
- Consumer Guideline – Heat Pump
- Consumer Guide to Sustainable Energy
- Consumer Guide to Renewable Energy
- Passive Solar Design
- How to make your Home Energy Efficient
- Renovating an Older Home
- Building an Energy Efficient Home
- Detailed Guide to Home Heating
- Detailed Guide to Home Insulation

16 Appendix D – Registered Installer Terms & Conditions

The following are the terms and conditions to register as an installer:

I confirm that I have reviewed and accept the following Terms and Conditions for registration on the Registered Installer List and that I will comply with these Terms and Conditions:

1. I undertake to furnish SEI with a valid tax clearance certificate (“TCC”) each year, and I attach a valid TCC for the current year. I accept that failure to furnish SEI with a valid TCC shall result in my removal from the Registered Installer List.
2. I understand that in order to remain eligible under the Scheme I am required to be registered on the Registered Installer List at **all** stages in the installation process relating to installations where I am the nominated installer including grant application, commissioning and sign off of the commissioning report.
3. I declare that I am competent and have the necessary
 - Training
 - Experienceto enable me to satisfactorily and safely install / commission equipment in the technology areas for which I apply for registration.
4. I have achieved certification from an accredited training course in respect of each of the technology areas for which I am registered (Copy certificate(s) to be supplied).
5. I accept that installations grant aided under the Scheme and which I commission may, for quality control purposes, be inspected by SEI or its authorised agents or contractors and I will assist, by making myself available and/or disclosing any requested information, and co-operate with any such inspector.
6. I fully consent to the results of such inspections being published by SEI or its agents or contractors and made available to the public in whatever media SEI may at its discretion choose.
7. I accept that failure to act on a direction from SEI or its authorised agent or contractor, to remedy a deficit identified as a result of an inspection may result in my removal from the Registered Installer List.
8. I accept that my engaging in fraudulent or inappropriate behaviour in relation to the Scheme will result in my removal from the Registered Installer List. I also accept that any failure by me to comply with these Terms and Conditions may result in SEI removing me from the Registered Installer List.
9. I am aware that SEI may de-register installers where SEI has evidence of repeated failures on the part of installers to deliver quality work or give customer satisfaction.
- 10.1 I agree that any dispute between me and SEI in relation to any matter in connection with the Scheme shall in the first instance be discussed between us with a view to finding a resolution. I agree that if the discussion between me and SEI fails, the dispute may be referred by either of the parties to an independent mediator, accredited by the Centre for Effective Dispute Resolution and appointed, in the absence of agreement between the parties, by the Chairman (or his or her deputy) of the Irish Commercial Mediation Association. Any mediation shall take place in Dublin, Ireland at a venue chosen by the mediator. The appointed mediator will seek to mediate a resolution of the dispute.
- 10.2 I agree that if the dispute between myself and SEI is not resolved in accordance with clause 10.1, the dispute may then be referred by either party to arbitration under the Arbitration Rules and Procedures of the Chartered Institute of Arbitrators Irish Branch and, in the absence of agreement, either party can apply to the Chartered Institute of Arbitrators Irish Branch to have such an arbitrator appointed.

11. I accept that, in order to be reinstated to the list after deregistration in accordance with these Terms and Conditions, I may be required by SEI to contribute to the costs of any re-inspections arising out of any rework declarations previously issued by SEI or any of its agents or contractors. Furthermore I accept that I may be required by SEI to contribute to the cost of a number (at SEI's discretion) of inspections carried out on my installations after re-registration.
12. I am aware that SEI intends to require Registered Installers to become members (at the expense of Registered Installers) of a recognised trade association of installers carrying out the type of work envisaged by these Terms and Conditions once such an association is formed.
13. I agree at my expense to attend targeted workshops when requested by SEI.
14. I undertake that the services provided by me pursuant to the Scheme will be carried out in accordance with recognised and accepted practices, acceptable industry standards and any applicable equipment installation guidelines and any relevant national and European laws and guidelines.
15. I accept that the Terms and Conditions for registration on the Registered Installer List may be updated from time to time on the SEI website and these updated Terms and Conditions shall apply to me with immediate effect.
16. I accept that in carrying out services pursuant to the Scheme that I shall not be acting in my capacity as a consumer but that I shall be acting in the course of my business.

Wood Gasification Boiler Declaration

To be filled out by the authorised representative of company or distributor

I declare that _____ (installer) is competent to install and commission wood log gasification boilers (name of boiler)

_____ registered under the Greener Homes Scheme Product List.

I accept that installations grant aided under the Scheme and which the installer above commissions may, for quality control purposes, be inspected by SEI or its authorised agents or contractors and I will assist, by making myself available and/or disclosing any requested information, and co-operate with any such inspector.

I accept that failure to act on a direction from SEI or its authorised agent or contractor, to remedy a deficit identified as a result of an inspection may result in SEI removing the products **and** installers from the Registered Lists.

Name (print): _____

Company (print): _____

Address (print): _____

Contact telephone number (print): _____

Email (print): _____

Signature: _____ Date: _____