

# Sustainability Seminars

## Galway Show May 2006

With the conference room filled to overflowing (extra chairs had to be brought in), the speakers at this special series of seminars on Sustainability were assured of an attentive audience.

Following the official opening on the Friday by Niall O'Brolchain of the Green Party, the first seminar was by **Peter Keavney**, Manager of Galway Energy Agency Ltd., who gave a detailed synopsis of what the Kyoto agreement means for individuals at national and local level. With a remit covering all aspects of energy use in the Galway area that includes everything from transport, education and waste through to renewables, management and domestic energy, he is particularly well placed to see both ends of the scale. The bottom line is that Ireland breached its Kyoto target in 1997 and by 2006 it is estimated

that this will increase to 25-26% and it's a rising trend. The main contributor is energy generation by the residential and transport sectors. Going over the allowed limit incurs a Kyoto fine of €100/tonne and the cost, nationally €900-1,000m/year. In individual terms, €200-250 per person annually. A local study by the Agency revealed an individual responsibility of some 3.3 tonnes per person per year in excess of that agreed at Kyoto.

European Environment Agency figures just published show greenhouse gas emissions in Ireland grew by 0.1% to 68.5 million tonnes in 2004, 22.7% above 1990 levels when the figure was 55.8 million tonnes

There are of course things which we as individuals are unable to control immediately, such as power generation, fuel types and the need to ensure national security of supply, however, actions we take at a local level, in the longer term feed through to influence national strategy. Having your house energy rated before it's built in order to assess the energy demand will guide you towards the best ways of reducing it that are built in, and therefore long term. These include better insulation, improving the glazing specification, heating and hot water systems integrated with renewable technologies, controls that are professionally sized and commissioned, low energy lighting and A rated appliances.

After a series of graphs showing lines going up as our carbon emissions have steadily increased, it was reassuring to now view ones with lines going down! Peter demonstrated very clearly the effects of improving the average 'U' value (heat loss) of the building envelope on energy consumption, particularly in older houses. A further illustration showed CO<sub>2</sub> emissions by fuel type, with numbers running into three figures, which was in sharp contrast to that for renewables where the number is zero. Peter concluded his presentation by listing a number of practical ways in which individuals can save their own 3.3 tonnes, most especially through incorporating renewables.



Limerick Clare Energy Agency

In summary, Peter defined sustainability as “The management and control of local natural resources and limitation of avoidable waste, with individual responsibility.” He concluded his talk with a rallying call: “Contribute towards the solution, not the problem, and invest in your environment because it will reward you.”

**Peter Keavney, Manager, Galway Energy Agency Ltd.,  
City Hall, College Road, Galway Tel. 091566-954  
email: pkeavney@galwaycity.ie**

Reinforcing this message was economist Richard Douthwaite who provided delegates with a look into a future, where energy is no longer a simple matter of throwing a switch and not thinking about it, in a talk entitled The Consequences of Energy Scarcity. As this was covered in our Summer magazine, if you would like to read more, back copies are available by telephoning SelfBuild Ireland Ltd. on ROI: 048/UK: 028 9751-0570.

**Richard Douthwaite Tel. 098-25313  
email: richard@douthwaite.net**

With the audience now encouraged to embrace a reduced energy lifestyle, thoughts turned to how to go about it, the subject of the next talk by **Sustainable Energy Ireland (SEI)**. Renewable energy leaves little or no footprint ecologically and is therefore the route to follow as Ireland aims to curb its dependence on imported fossil fuels and increasing CO2 emissions. To help individuals cope with the extra expense of installing these systems into their new homes, a series of grants have been made available under the **Greener Homes Scheme**. In order to receive help,

you must first of all fill in an application form (with the help of a suitably qualified installer if necessary), and satisfy certain criteria, terms and conditions. Finding out what's best for you requires some reading and applicants are advised to consult the short but clearly laid out booklets published by SEI on energy efficiency in the home, insulation, home heating systems, renovation, building an energy efficient home, renewable energy and sustainable energy. A sample Application form was distributed to delegates, together with an equal number of explanatory notes and a print out of the approved installers by product type. There is a lot of information to absorb and think through at a time when there is so much else to decide about a self build or renovation project, but SEI emphasised that it was very important not to leave it till the last minute as it is essential that you apply for and receive grant approval prior to purchasing any system or undertaking associated work on site.

**Helpline 01-850-734-734  
www.sei.ie/greenerhomes**

A welcome break for afternoon tea was followed by an introduction to **Building Energy Labelling** (Energy Labels for Houses) by **Pat Stephens** of the Limerick/Clare Energy Agency. Pat explained that his Agency had a programme similar to that of Galway and that they are both part of a network of 16 agencies covering all of Ireland. A brief look at the history of energy conservation in buildings and how 'U' values have been reduced since 1991 from 0.55 to 0.27 for walls and 0.45 to 0.25 for roofs in 2002 led on to the main substance of his talk, the implementation of the Energy Performance in Buildings



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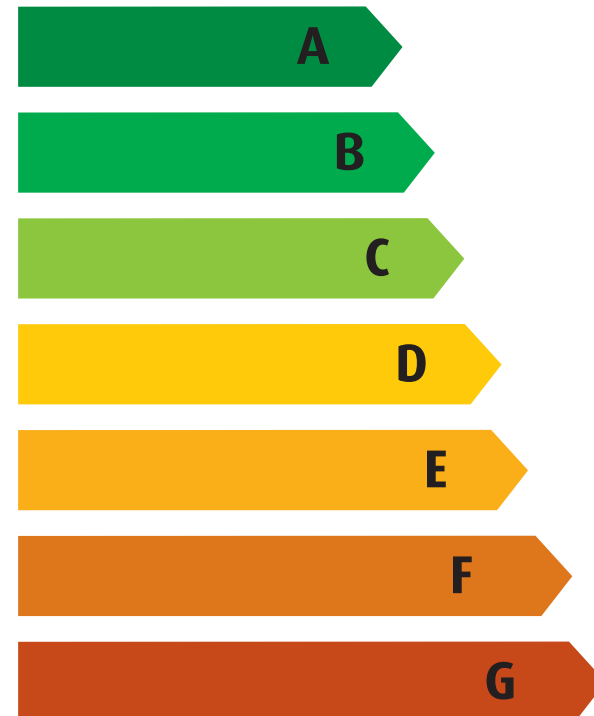


Directive (EPBD). The timetable for implementation of this is January 2007 for new dwellings and January 2009 for existing dwellings. In practical terms, when a building is constructed, sold or rented, the owner will have to provide a BER or Building Energy Rating together with an Advisory Report. In addition, all new buildings and major renovation projects will have to reach a minimum energy performance target. A major renovation is defined as a renovation of 25% or more of the building, or a refurbishment that costs 25% or more of the building value (excluding the land value). The efficiency of boilers and heating systems will also be tested through "regular inspection". For boilers less than 100 kW output the definition of "regular inspection" is open for each EU country to define. Annual inspection and cleaning is advisable for all heating systems for reasons of safety and fuel efficiency.

The domestic energy assessment procedure will take into account the size of the property, the fabric of the building, heat gains, ventilation rates, hot water system and the boiler efficiency. These will be independently assessed and the information valid for ten years.

Energy labels are not a new concept as we are already familiar with them on many white goods such as fridges and washing machines, but what exactly do all the symbols and figures mean? Pat explained that it was important to understand these in order to make the best choice. Applying the same analogy to the EPBD, the 1997 Building Regulations equated to a maximum permitted heat energy rating of 160 - 190kWh/msq/year. When the Regulations were updated in 2002 this changed to 80 - 120kWh/msq/year. An 'A' rated building under the new system

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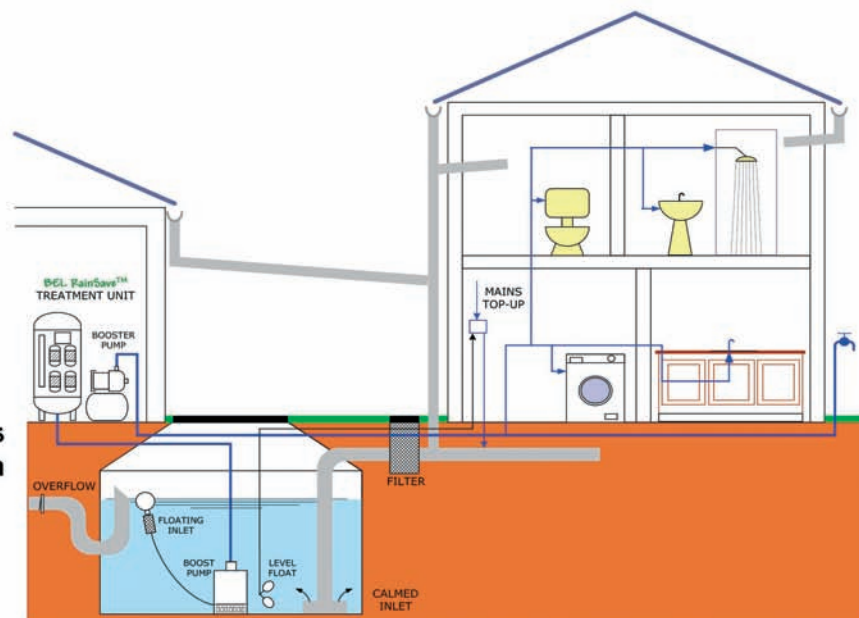
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will need to use less than 50kWh/msq/year. Interestingly, a passive solar house has a rating of <15 kWh/msq/year. Everything has its price and the EPB is no exception. The cost of the rating and report in a new dwelling (rated using the drawings), will be €100 and in an existing house €300 with a two week turnaround between survey and results.

What effect is this likely to have on the housing market as a whole? That rather depends upon your starting point. Energy rating is bound to be used as a marketing tool giving an edge to those properties scoring well; this in turn will impact on building design, leading to a demand for higher specification and a new market for energy efficient services and products. Slightly less attractive is the cost, possible impact on property values and delays whilst reports are compiled and acted upon in order to present a more favourable dwelling, prior to homes being sold.

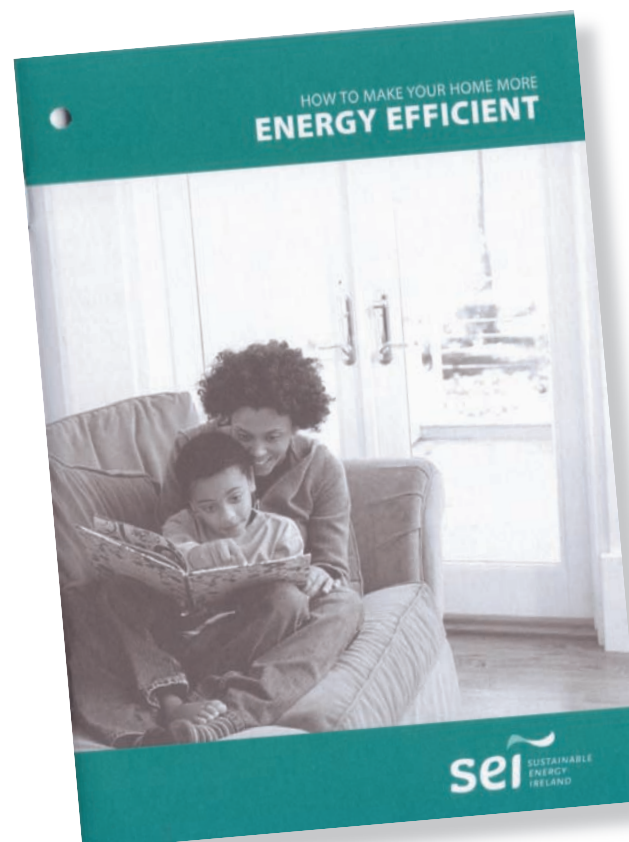
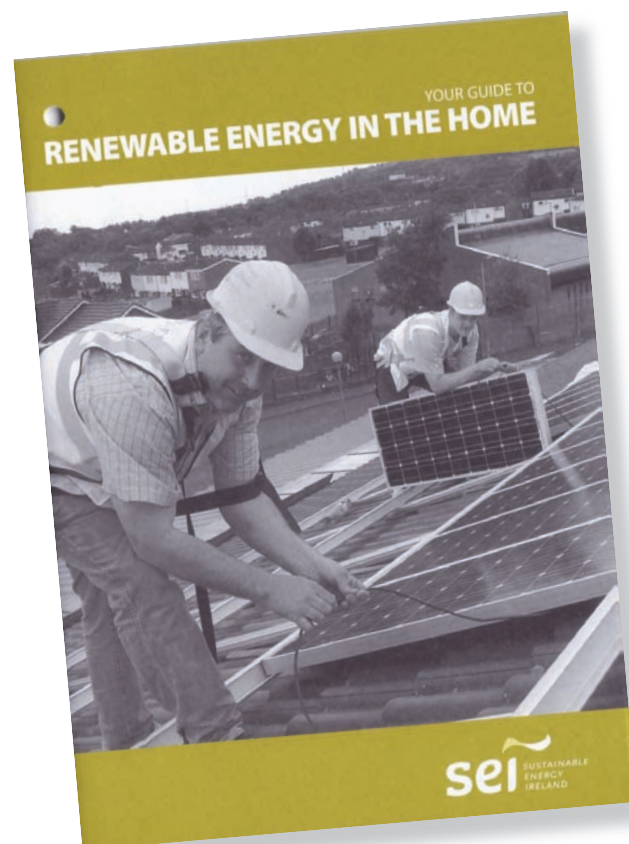
With self builders, extenders and renovators particularly in mind, Pat provided guidelines for gaining an 'A' rating. For the first category he suggested that you should evaluate the benefit of any additional measures to achieve energy efficiency, before going ahead, which in turn will allow you to budget for your energy usage more accurately and at the same time help to reduce the amount of CO2 you are responsible for creating. With a renovation, it's important to first of all weigh up what changes will be the most beneficial and then have a transparent and independent assessment of the work done. Further information on the EPBD is available from the website [www.epbd.ie](http://www.epbd.ie)

**Pat Stephens, Manager, Limerick/Clare Energy Agency, Foundation Building, University of Limerick**  
Tel. 061-234-296 email: [info@lcea.ie](mailto:info@lcea.ie) [www.lcea.ie](http://www.lcea.ie)

With 0kWhr/msq/year the ultimate goal, achieved by **Passive House Design**, the audience were keen to learn more about the concept. This most interesting talk, given by Lars Pettersson of Scandinavian Homes Ltd. will be printed in full in our next, Winter, issue.

**Lars Pettersson, Scandinavian Homes Ltd., Moycullen, Co Galway** Tel. 091-555-808  
email: [lars@scanhome.ie](mailto:lars@scanhome.ie) [www.scanhome.ie](http://www.scanhome.ie)

For many, a house that lacks a fire of some description is a step too far, and that may be part of the reason for the appeal of **Wood Pellet Heating Systems**, the subject explored by the Managing Director of the Tipperary Energy Agency Ltd., **Seamus Hoyne**. He began by looking at the basic principles of wood burning which are dictated by moisture and energy content, fuel type and fuel quality. A simple graph carried a vital message; wood pellets have less than one third the moisture content of wood chips and half as much again energy. Wood pellets are made from sawdust and there is an EU quality standard, CEN TC 335, which not only defines and describes fuels, but also sets benchmarks for their production, use, sampling etc. In future, all fuels should be produced to this standard. With specific regard to wood pellets, if we are to create a wood biomass system then a supply of high quality wood fuel is vital. This is particularly important for domestic systems which are more susceptible to problems from poor quality pellets. ►



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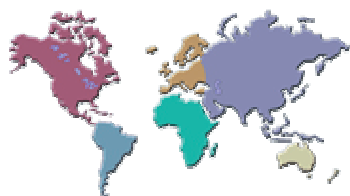
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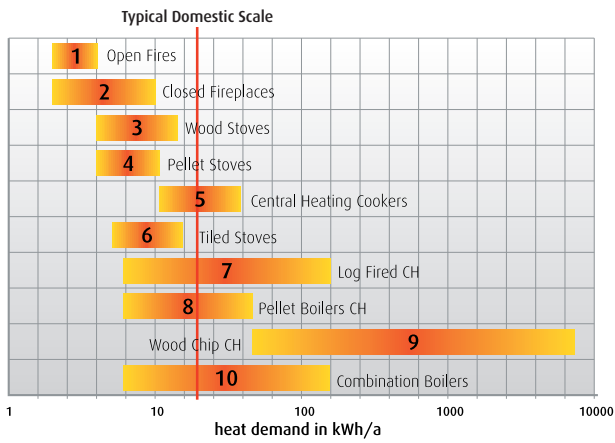
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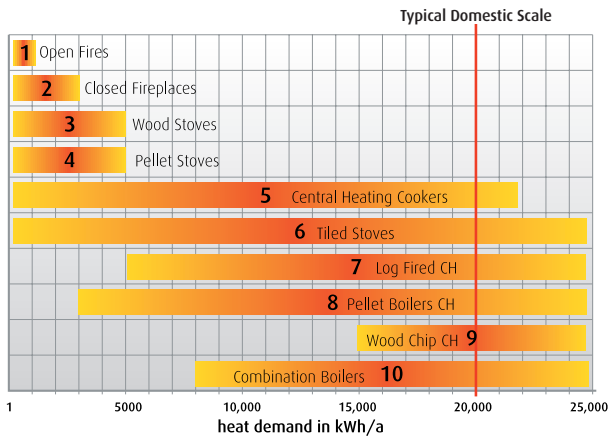
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OUTPUT RANGES BY SYSTEM TYPE



ANNUAL OUTPUT BY SYSTEM TYPE



Before you decide to go down this route, there are a number of questions to which you need to find answers:

Who will supply the fuel, when and how?

Will it be stored in bags or bulk?

Will it be fed to the heating unit manually or automatically?

Stove or boiler?

What type of distribution – convection, radiators or underfloor?

What type of controls?

And finally, what type of system – pellet stove or pellet boiler?

Pellet stoves are normally used only as room heaters although some models include a hot water heater (via a back boiler), with optional proportions for each, ranging from, for example, 80% hot water and 20% room heating to 100% room heating. Pellet boilers will heat the entire building, have automatic temperature and time controls, can replace existing oil or gas fired central heating systems, and are available in a range of sizes with varying feeding mechanism and ▶



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storage methods. It is possible to retrofit a pellet burner onto an existing oil boiler, but bear in mind that it may have a lower efficiency. An ideal combination is wood pellet with a solar hot water system, which would involve both being connected to a central large hot water storage vessel.

Designing a system to suit your needs raised further questions:

What do you want to heat – room only, house – space heating only, or house – both space and hot water?

What controls do you want – time, temperature, both, none!

What storage space do you have?

Is there an existing heating system?

What is your budget?

Depending upon your reply to the above, there are further design considerations relating to the actual boiler chosen. It must be able to cope with a peak load or, in a combination system, act as a back up. Correct sizing is important so that energy is not wasted, will you use pellets, chips or both? You may need to include a heat or 'buffer' store with some systems to achieve an efficient operation and the design of the boiler room itself is critical also. Not surprisingly, Seamus urged potential wood heating system buyers to get expert advice on all of these points.



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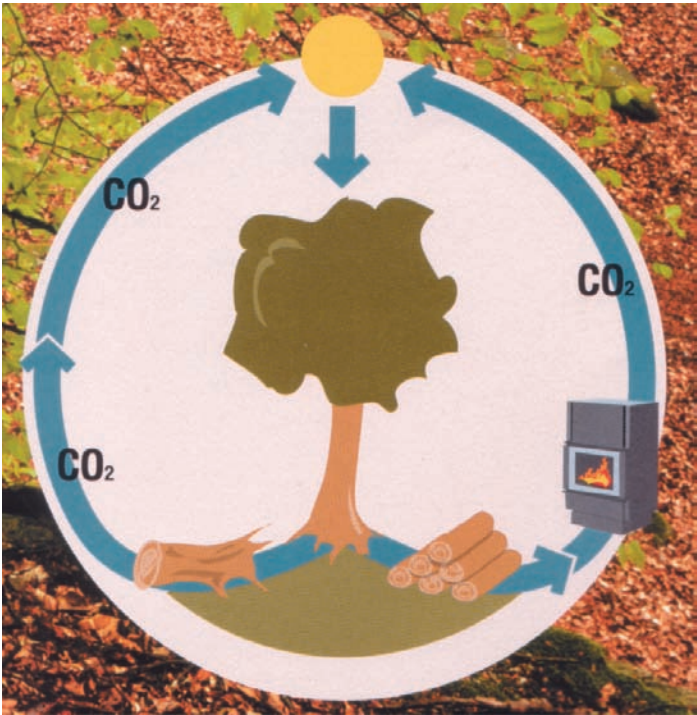


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Seamus also reminded his audience that they would need to think through the question of keeping the fuel in good condition for optimum efficiency and that this therefore required storage with room for unloading in a safe environment, as well as a method for transferring the fuel to the boiler or stove.



Morso

Recognising that many people are yet to be convinced that a wood pellet system can provide heating and hot water of a quality and quantity sufficient for a home, Seamus provided some powerful evidence in the form of a comparison of wood burning methods and their outputs, measured in kW. The crunch question “Can a pellet system really be as good as oil, and, further, save me money?” is the one we all want to know the answer to and Seamus did not disappoint. Taking into account all the variables of the two fuels, he showed that, although installation of a pellet boiler is about €5,000 – €10,000 compared with €1,000 – €2,000 for oil, the annual running costs of oil for a house with a home energy rating of 20,000kWh demand would be €1,600 compared to €765 for a pellet system.

Thus the pellet boiler would pay for itself in approximately eight years unless, that is, you qualify for a grant under the Greener Homes Scheme, in which case the sums are even more attractive.

As with all the products and services you put in to your new home, it’s important to get a breakdown of all the costs involved from potential suppliers. In his concluding remarks, Seamus urged his audience to look anew at wood pellet heating as a mainstream fuel, decide what you want to heat and how, first, get a range of quotations remembering to compare like with like, to never forget the ►



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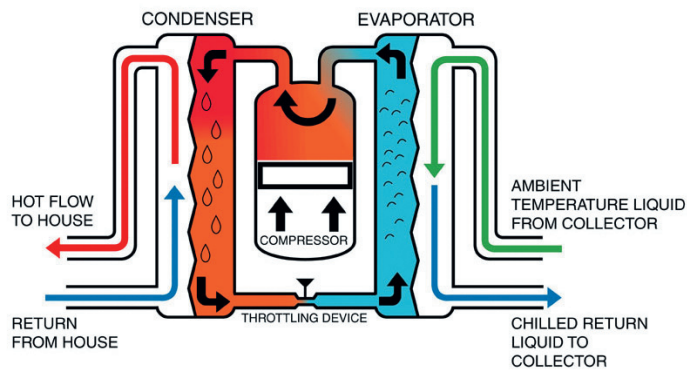
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**Seamus Hoyne, Managing Director, Tipperary Energy Agency, Craft Granary, Church Street, Cahir, Co Tipperary**  
Tel. 052-43090 email: shoyne@tea.ie www.tea.ie

Following such a convincing “sell” of wood pellet fuel systems was a challenge that the final speaker, Barbara MacMahon clearly relished and indeed, rose to. Going straight to the heart of the matter with the question “Why choose a geothermal heat pump as a central heating solution?,” she answered with a very attractive list of reasons:


**Economy** – electricity costs as low as 30% of the cost of oil.

**Convenience** – no fuel to run out of, store or keep dry, one installation and commissioning fee, thereafter no need to look at it again.

**Reliability** – no regular maintenance required. With only three moving parts, two of which are circulation pumps found in every heating system, the whole geothermal system should keep going for up to 25 years without servicing.

**Safety** – no risk of a fire or explosion because there’s no fuel burning involved.


Barbara then described how a heat pump works, itemising the essential design constraints of sizing the heat pump correctly through an energy audit, designing the collector appropriate for the site, choosing what type of internal distribution – radiators or underfloor heating, and finally ensuring that if hot water is heated by immersion, it is done in the most efficient way possible. After discussing these points in detail, practical considerations were next. For a quotation you will need to provide a full set of plans and site layout. The most popular choice uses a shallow,



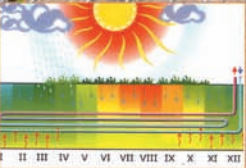
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horizontal array which will require a large area to be left green and permeable to water. If soil type and depth are unsuitable, then you could opt for vertical boreholes which requires less space, or a river or fast flowing stream.

The actual installation is in three phases. Phase one is preparing the site and installing the geothermal collector, two installing the heat pump unit and three, testing and commissioning.

With a geothermal system you are designing for a lower flow temperature, so should bear in mind electricity tariffs as the heat pump is powered by this and possibly an immersion heater. You need to decide on either underfloor heating or radiators, use appropriate temperature controls and set up a heating schedule that reflects the occupants lifestyle. If you wish to have hot water from the system as well, the most efficient way of doing it in conjunction with an immersion heater, preferably using night rate electricity, should be as a top up, the geothermal system having pre-heated the water to about 45degC. It is essential that these choices are made at the very beginning of the design stage.

In addition to a price, you should obtain an itemised scope of works and the site should be surveyed by the potential installer. To find one, consult the list of approved installers from SEI in ROI or in NI under the Clear Skies programme, or ask your plumber, providing that he or she has trade experience of installers or suppliers. Whoever you choose should have a track record, best judged on the amount of installations done, and industry accreditation of both skills and equipment.

**Barbara MacMahon, Sales & Marketing Manager, Dunstar Ltd., 1 Kent Street, Clonakilty, Co Cork Tel. 023-351-65 email: solterra@dunstar.ie www.solterra.ie**

With much food for thought, the delegates then made their way into the exhibition.

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