

# A Buyer's Guide to Low-Energy and Passive Houses

Buying or building a house is one of the most important decisions in your life. It will have huge implications on your finances and your well-being. By ensuring that your future house achieves the highest energy, health and comfort standards, you are taking a big step in the right direction. This buyer's guide will help answer most of your questions and give you some suggestions which should help you to make the right choices.

## *What is a low-energy house?*

A low-energy house is one that has been designed and built to the highest level of comfort while having the minimum energy requirement for heating, lighting, etc. This can be achieved with a high level of thermal insulation, an air-tight shell, a controlled fresh air ventilation system and responsive heating controls. A low energy house also maximises the use of free solar gains through good design and uses renewable energy for heating through solar panels, wood heating or a heat pump.

## *What is a passive house?*

A passive house is a super low-energy house. The same principles are applied, only pushed to a degree where there is no need for a conventional central heating system. A passive house requires about 4 times less energy for heating than a house built to Irish building regulations. For more information on passive houses, please visit our website ([www.sei.ie/reio.htm](http://www.sei.ie/reio.htm)).

## *What are the benefits of living in a low-energy house?*

- Excellent insulation and air-tightness. This means better comfort (no cold walls or windows, no drafts);
- Controlled ventilation. This results in outstanding fresh air quality, protection against respiratory problems and avoidance of damp and mouldy conditions;
- Being able to ventilate without opening the windows. This also eliminates unwanted noise and reduces the risk of intrusion;
- Protect your house against rising energy prices;
- High energy performance generally goes hand in hand with good quality construction;
- Reducing your energy consumption helps the environment.

## *As an investor, what will I gain from it?*

- Low-energy houses are easier to sell or rent;
- Gain a competitive edge by pitching your product as high-quality and eco-friendly;
- Better acoustic protection allows you to enhance the potential of noise sensitive areas for development;
- High comfort and low-energy bills mean tenants stay longer;
- Higher levels of client satisfaction mean more referrals and more business.

## *Do I need professional assistance to achieve a low-energy building?*

We strongly recommend that you find a design team, i.e. an architect or an engineer to assist you with your project. Their role will be to:

- Work on your brief and propose one or several design concepts;
- Develop the chosen concept into a detailed design including the specifications for the building and its services;
- Carry out the tendering process and manage the construction process;
- Manage the commissioning and hand-over process.

When choosing your design team, ensure that the professionals involved have the appropriate qualifications, a proven track-record in the area of sustainable energy design (ask for customer references) and that they subscribe to the codes of practice of the relevant trade associations.



### *What brief should I give to my design team for a low-energy house or a passive house?*

The Heat Energy Rating of your house is a key indicator of its overall energy performance. It is a measure of how much heat is required from the heating appliances to maintain comfortable conditions and produce hot water, expressed kWh/m<sup>2</sup>/year of living area. By January 2009, all houses sold or rented will be rated for their energy performance according to this type of indicator.

We recommend you adopt one of the following European Standards as a target Heat Energy Rating and include it in the brief for your design team:

	Heat Energy Rating	Annual energy bill (euro/year) (*)
Low-Energy House	42 kWh/m <sup>2</sup> /year	Oil: 640 euro/year Pellets: 280 euro/year
Passive House	30 kWh/m <sup>2</sup> /year	Oil: 430 euro Pellets: 200 euro

(\*) Heating bill at a cost of 0.5 euro/litre of oil and 180 euro/tonne for wood pellets for a 150 m<sup>2</sup> house. See our heating cost comparison tool in the reference section of our website.

### *What kind of site should I be looking for?*

Try and find a site which meets as many of the following conditions as possible:

- It is south facing;
- It is not overshadowed by neighbouring buildings or plantations;
- It is sheltered from prevailing and northern winds by terrain, walls or vegetation;
- The location minimises dependence on car transport;
- It has the potential to accommodate the use of renewable energy materials sourced locally.

### *How can design and specification options be checked to see if our target will be met?*

We recommend that your design team carries out a computerised analysis to measure the effect of the various design and specification options on the Heat Energy Rating of the building. This analysis should be based on the methodology of the European Standard EN 832.

SEI-REIO is happy to recommend suitable tools to carry out this analysis. If you are buying an existing house, you should either require strong evidence of its Heat Energy Rating from the seller or require an energy audit from your own engineer.

### *Is air tightness compatible with good indoor air quality?*

Different strategies can be applied to maintain a good level of fresh air renewal without excessive heat losses. In a low-energy or a passive house, a controlled ventilation system with heat recovery is recommended. Such systems can also be fitted with a heat pump system to produce hot water from the heat recovered.

### *Does my house have to look like a bunker to be energy efficient?*

No, a low-energy house doesn't need to look any different from any other house; neither does it preclude architectural creativity. However, a compact building with a simple shell form is less conducive to heat losses through its external walls.

### *What about the sustainability of the building components themselves?*

The negative environmental impact of energy use in Irish buildings causes up to 10 times more pollution than the materials used to construct them. However, the sustainability of the building components is an aspect that should not be neglected. Important considerations include:

- the energy required during their production cycle (from mining to delivering them to your site);
- the associated greenhouse gas emissions;
- the use of natural resources to manufacture them;
- the air pollutants generated during their manufacture as well as during the life of the building;
- the wastes generated during their manufacture and after their life-time.

For further information on renewable energy and energy efficiency, please visit [www.sei.ie](http://www.sei.ie).

Call 023/42193 for a free information pack on how renewable energy can be applied to your house or business.

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