

AN ALL IRELAND MAGAZINE FOR SELF-BUILDERS & HOME IMPROVERS

SPRING 2015
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SelfBuild & Improve *Your HOME*

Good connections

Free energy for your home,
is it worth it?

Splashing out!

Showers

Hemp

The answer to zero carbon homes?

Lock right, lock tight

keeping safe and secure

Finding a site

And then there were more

Making small spaces bigger

DISPLAY
UNTIL
28 APRIL

ISSN 2049-3630
9 772049 363002

Books: Orla Kiely, Self-build,
Flower farming, Net Zero homes

Garden: Growing
from seeds

Contemporary
architecture

Comment:
air quality



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GPS Colour Graphics Ltd

Distribution:
EM News Distribution Ltd

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Spring 2015

HAVING LITERALLY KEPT the construction industry alive during the recession, self-builders and home improvers in ROI go into 2015 finding themselves facing a new and potentially much more serious threat. It is the Building Control (Amendment) Regulation S.I.9. This proposed legislation does not recognise the particular needs and requirements of self-builders who would be better served by the creation of an independent monitoring body trained specifically to ensure all buildings are correctly constructed, similar to that already operating in NI. If you have not already done so, please write to Minister Alan Kelly urging him to take the lead in this debate and create an independent inspectorate which would be to the benefit of all those in the construction industry, from private individuals to the many different professionals.

On a lighter note, I am once again temporarily occupying the editorial chair as Astrid, having completed the renovation work and moved into her new house in August, had a baby girl, Ella, in early October. Many congratulations to her, Tony and two and a half year old Jack.

If, during the recent holiday your thoughts turned to the possibility of joining the ranks of self-builders, keep a hold of those ideas as they could lead to something spectacular as in our case study from Co Down, *La dolce vita*.

Perhaps you're already underway and it's decision time on what type of shower to buy, the best locks for windows and doors to keep you safe and secure and whether solar pv, wind and water energy could save you money on your utility bills in the future. Answers to all of these and more are in this issue.

We also begin this year with the first in a series of articles on making the space you have fit the life you lead now. Why go to all the expense, time and trouble of moving home when all that could be needed is some re-organisation of the existing room layout or a micro extension? *And then there were more* starts on page 94.

Whatever your house plans for 2015, we'll be here to help with inspiring case studies and guidance on everything from finding a site to painting and papering.

Happy building!

Gillian

Gillian Corry, Managing Editor
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Our panel of experts for spring 2015

ART MCCORMACK

Art McCormack has been practising in the field of architecture for the passed 27 years, including experience in Finland and USA, involving a wide range of building types and most recently Passive house design, specification and construction.
www.mosart.ie



CATHERINE DORAN

Catherine has 10 years' experience writing for trade and national publications, including construction and architectural magazines. She's based in Dublin.
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CIARAN HEGARTY

Ciaran is a woodwork and construction studies teacher in Moyle Park College, Clondalkin, Dublin. He qualified from the University of Limerick in 2005 with an Honours Degree in Materials and Construction with Concurrent teacher education. He resides in Leixlip, Co Kildare,
email.ciaranhegarty2005@hotmail.com



COLIN BELL

Colin Bell MRAI is an architect and self-builder who specialises in different aspects of sustainability including low energy buildings and the relationship in architecture between health and well-being. He views the Walter Segal method as a model for excellence and grounded his practice, which he established in 1996 in Sligo, on its 'honest and simple' precepts.
www.colinbell-architect.com



FIANN Ó NUALLÁIN

Award winning garden designer, author and broadcaster, Fiann has a background in fine art, sculpture, horticulture, ethnobotany and complementary medicine. He currently is a co-presenter on RTE 1's Dermot's Secret Garden programme and is a regular *SelfBuild & Improve Your Home* writer. Check out Fiann's blog on <http://theholisticgardener.com> or send him a tweet @HolisticG



JOHN SODEAU

John Sodeau is the Professor of Physical Chemistry and Director of the Centre for Atmospheric Chemistry Research (CRACLab) at University College Cork. His main research interests are monitoring chemical particulate pollution in the atmosphere and the real-time detection of bioaerosols (fungal spores and bacteria) at green waste/composting sites. He has lectured recently on these topics in a range of locations from Buenos Aires to New York to Portland, Oregon. T/P: 021 4902680
Email:j.sodeau@ucc.ie



STEPHEN MUSIOL

Stephen Musiol runs the architectural practice small spaces, helping home-owners find the best ways to increase their space, and the best ways to improve what they've got. He focuses on designing changes to houses that make them livable, lovable and lasting.
Dublin
Tel: 01 454 7287
www.smallspaces.ie



STEVE ALLIN

Steve Allin is an author, teacher and consultant on ecological building. He has been enthusiastically pioneering the use of hemp in building in Ireland and internationally since 1997. He is the founding director of the International Hemp Building Association (IHBA).
www.hempbuilding.com



TONY TRAILL

Tony Traill is a director of Element Consultants; a small, multi-disciplinary consultancy specialising in energy and resource efficiency at all scales.



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**SelfBuild
Ireland Ltd**

Published by **SelfBuild Ireland Ltd**, 119 Cahard Road, Saintfield, Co Down BT24 7LA. Tel: (NI 028 / ROI 048) 9751 0570
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**Magazines
Ireland**





Stop Press

The latest happenings and products of special interest to self-builders and home improvers.

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Charity begins at home

Case Study

Michael and Grainne Keane of Co Meath met the architect who helped them to create a new home that echoes the past through a charity fund raiser.

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La dolce vita

Case Study

Inspired by a memorable Italian lakes holiday, Colin and Barbara Barry have built a home on the Co Down coast to rival any abroad.

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Seeing inside the box

Contemporary architecture

Fine feathers don't make fine birds and the same is true of houses! These examples from around the world demonstrate the importance of the structure underneath all the fine finishes.

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Belfast Show

Come and join us at the King's Hall Complex, Balmoral, Belfast on 13, 14 & 15 February for the SelfBuild & Improve Your Home Show. Bring your plans for copying and leaving with suppliers for pricing, gain some facts and figures for your project or just pick up ideas to make your home brighter and better.

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Lock right, lock tight

Having your new home or extension the successful target of a burglar is not a pleasant experience so find out how to keep your home safe and secure.

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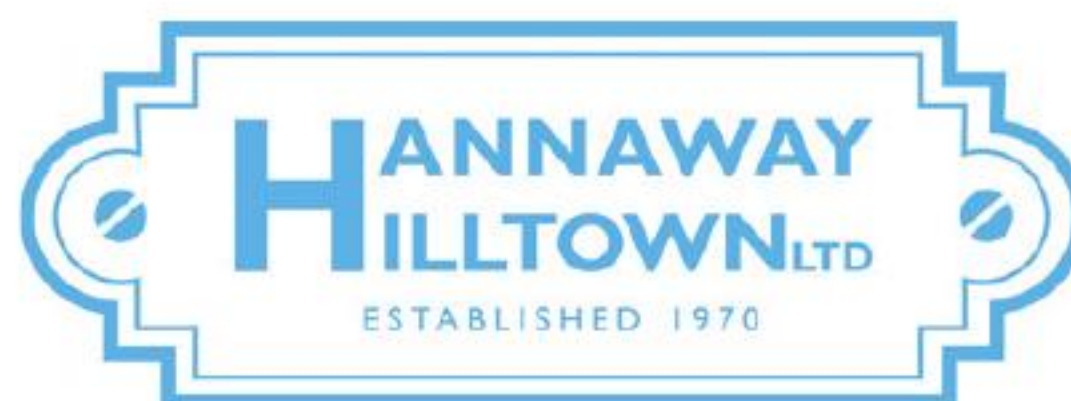
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Storage is always a problem in a bathroom, solve it yourself by making this handy cabinet.

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OLDER PROPERTIES have a charm which is timeless, which is just as well because maintaining them is usually not quite so attractive, especially the windows. Finding a replacement for these that is cost effective and require less looking after is, like the windows, a tall order. Whether small or tall, the **Residence 9** range of thermally efficient composite profiles from Lisburn based **APS** could be what you're looking for – even if you're in a new house built to passive standards but



want the elegance of windows designed to Article 4 Conservation Guidelines. The windows have deep ornate detailing to the inside, flush sash to the outside and can be fitted with period hardware such as handles and peg stays. Normal window frames have three, five or sometimes six chambers and are usually 70mm or up to 82mm wide; Residence 9 has nine chambers and is 100mm wide giving increased thermal performance and allowing larger sashes to be produced based on the inherent strength. Also attractive is the ten year guarantee, the 11 standard colours with an additional 35 mixed colour options (different colour inside to outside) and a U value of 0.8 W/mK. The full range can be viewed at www.residence9.co.uk These hand-made windows are available in 6-8 weeks from order and are a further development from a company that provides specific cost-effective solutions for architectural glazing. This new agency has added to



their range an authentic design that is ideal for use in conservation areas and will appeal to any homeowner who is looking for affordable style.

For all the other products available from the company, have a peep through the windows at **APS, 50 Enterprise Crescent, Ballinderry Road, Lisburn, Co Antrim** tel. 9266 0500 visit www.aps-group.co.uk

stop press

'I'd like to thank the academy....'

THE IRISH CONSTRUCTION INDUSTRY has received a major boost with the announcement that **Saint-Gobain** is to set up a construction skills academy that will train 25,000 new construction workers over the next five years.

'This is a red letter day for construction in Ireland as it marks the most significant investment in education and training in the industry since the crash of 2008,' Saint-Gobain Managing Director, Brian Dolan, said at the academy launch. 'We want to replace the 'lost generation' of construction workers who have left Ireland or the industry over the last six years. There is a massive shortage of skilled workers in the Irish construction industry, which is a key factor in the lack of housing supply. We are opening this skills academy as a vote of confidence in

the Irish building industry, which will triple housing output by 2020.'

Situated near Lucan, Dublin, the state-of-the-art training facility will provide courses for all of the key construction professionals including builders, architects and trades people. The topics covered range from practical site installation to building physics and building regulations



Pictured at the announcement (l-r): Alex White TD, Minister for Communications, Energy & Natural Resources; Brian Dolan, Managing Director, Saint-Gobain Ireland and Claude Imauven, Saint-Gobain Senior Vice President of Construction Products Sector.

For more information on upskilling yourself or your employees go to tech.ie@saint-gobain.ie or contact Saint Gobain, Unit 4, Kilberry Business Park, Nangor Road, Dublin 22 tel. 01 629 8400 www.saint-gobain.ie



Causeway Riven

Causeway

Causeway Slate Effect Tiles

Northstone manufacture the Scott range of roof tiles and have fifty years experience making roof tiles in Toomebridge, Northern Ireland.

The evolutionary new Causeway roof tile is a fifth generation flat tile developed by the Company. The Causeway tile offers contractors, specifiers and home builders the beauty of a slate effect roof while keeping cost to a minimum.

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Colour samples



Product Samples

The colours reproduced within this brochure are as accurate as the photographic and printing process will allow. Where colour matching is critical, it is advised to view actual product samples which are available from Northstone on request.

Northstone manufacture roof tiles in one of the most modern, and energy efficient tile plants in Europe. In keeping with the Northstone environmental policy, the Causeway incorporates recycled product and by design the Causeway uses less raw material per m² than other roof tiles. Products are manufactured to; ISO 9001, 14001 and 50001 quality, environmental and energy management systems.

Northstone is committed to product development and continuous improvement for its roof tiles and fittings. All information in this brochure is accurate at the time of printing

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a 3 - 12 Kwh capacity storage. The whole system is controlled remotely via an app, which can be programmed to fully utilise the solar yield or night-rate tariffs. If the battery becomes depleted there are pre-programmed recommended parameters which utilise the pv available to the

maximum efficiency; these can be altered if tariffs or energy requirements change. The batteries are generally service free, with a life-cycle duty of 2,500 - 20,000 cycles depending on battery type and depth of discharge. In keeping with this environmentally friendly system, the batteries are fully recyclable and part of the 'back to manufacturer' WEEE like-for-like free disposal. Cost per watt will vary depending on individual factors but the basic lead type battery of 11kwh generally adds 60 cent per watt extra delivered and installed (€6,250/£5,100 excl. VAT approximately).

To see it all in action, charge down to **Suas Energy, The Fair Green, Kilsallaghan, tel. 01 8400 175 www.suasenergy.ie**

stop press

A golden hello



The Stirling Collection

FIRST IMPRESSIONS really do count and a pair of stylish entrance gates say clearly to everyone who passes that what lies beyond is something special. It doesn't matter if your project is a restoration or a new build, a pair of heritage gates from **Golden Gates** provide an entrance that complements every architectural style. The company has been supplying quality period cast iron gates and railings since it was established in 2003 and has built up a collection of styles that can last for literally centuries! Crafted in solid cast iron using time-honoured techniques, the range comprises a unique collection of 19th century inspired pieces with patterns faithfully replicating those in the original Sun Foundry catalogue of 1897. The gates may be historic, but they also enjoy some very 21st century features such as integrated automation and intercom systems.

For more information on really making an entrance visit **Golden Gates, Co Wicklow tel. 01 286 2495 www.goldengates.ie**

Ready, steady, bake!

IF YOU FANCY BECOMING the new Paul Hollywood or see yourself as a budding barista, then you'll certainly need state-of-the-art kitchen appliances. From bold-coloured kettles and toasters to stylish bread makers or head turning slow cookers, the proof of a great pudding - or cake - is often down to the tools used. If you're planning to apply for The Great British Bake Off or the next series of Masterchef, you'll need to take a trip to the new specialist kitchen appliance showroom just opened by **Hannaway Hilltown** in Co Down. The company, which is also celebrating 45 years in business, has on display a wide selection of products from large ovens to small blenders. Choose from **Bosch, Neff, Siemens, LG, Rangemaster** and more, with products designed to suit a range of lifestyles and tastes (not to mention expertise!), the fully trained staff will guide you to the best solution for your new kitchen. This second showroom complements their existing one which features a variety of kitchens, bathrooms and bedrooms, making it a 'must visit' destination for furnishing and equipping your new home or extension.



The place to go Mon - Fri 9am - 5pm, late night opening Thurs 8pm, Sat 10am - 4pm or make an appointment to visit us: **Hannaway Hilltown, 44 Main Street, Hilltown, Co Down, Tel. 4063 0737 www.hannawayhilltown.co.uk**

“

Michael then had an opportunity to meet Fergal at the Open Door event in Dublin organised by the Simon Community. 'For a donation of €50 - architects give their services for free - I was able to talk with him for an hour and I just knew he was the right guy to do it.' ”



Charity begins at home

It might look like a traditional farmhouse, but the Keane family's new home in Co. Meath is actually a modern, energy efficient house that's perfect for the family of five.

When Michael and Gráinne Keane got the opportunity to purchase a site and move to the country, they jumped at the chance. Living in Dublin at the time, the idea of relocating to County Meath (Gráinne is from the area), and building the house of their dreams was too good an opportunity to pass up.

It was a greenfield site and apart from some minor drainage issues, very little work was required before construction. The next step was to find an architect to translate their vision into reality. 'We were keeping an eye on websites around Kildare and the Meath area in relation to planning applications. I also bought plans and saw one that I really liked by a Dublin architect.' Michael then had an opportunity to meet Fergal at the Open Door event in Dublin organised by the Simon Community. 'For a donation of €50 - architects give their services for free - I was able to talk with him for an hour and I just knew he was the right guy to do it. My wife then went to meet him and after that we hired him. I actually ended up seeing two architects but we just felt that Fergal was the guy for us. He asked us what we wanted, the style of house we were after, how we lived our lives and where we spent most of our time. He came to us with some sketches of the exterior, the interior and the lay-out and we straight away thought, that's it! He also gave us a 3D view, it was so impressive to see all your dreams visualised in a drawing.' ►



More photographs available at
www.facebook.com/selfbuild







Planning

When it came to the planning process, there were some issues that needed to be dealt with as Michael explained. 'In terms of style, we did come up against a few problems with Meath County Council. The initial design featured glazing to the front in the form of a porch but the Council wanted the house to have a traditional stone finish, as in the rural planning guidelines, so that had to go. It was a pity because there are beautiful views we could have taken advantage of, but having said that, I'm completely happy with the finished house.' Otherwise the planning process went very smoothly. 'We didn't go through any pre-planning meetings, instead we decided to see what their response was. We were asked for some adjustments, which we did, but in the process the house became a bit bigger in style. Despite that, the Council were happy and so were we. We'd heard horror stories of people having serious problems with planning and to be honest, I was expecting trouble, but it didn't materialise, we were very lucky.'

A site meeting every two weeks ensured the couple were kept in the loop at every step of the way, from foundations to snagging. 'We went to all the site meetings and I also used to go down at the ►





weekends, look around the site and generally keep an eye on things.' The builder on the project was especially helpful, even taking calls on a Sunday when Michael was on site! 'We made a few changes along the way and he was very open to that. He was also very fair when it came to fees. Really, he was excellent, very, very sharp. Everything was coordinated and his project planning was second to none. Nothing caused a delay and I can truthfully say we had no problems, in spite of the weather which was awful, it seemed to rain the whole time.'

Style

Architecturally and environmentally, the couple achieved the best of both worlds. The house looks like a traditional farmhouse with a courtyard from the outside, yet it is barely two years old, inside there are innovative modern features to meet stringent energy efficiency requirements. 'We knew from the start how we wanted the house to look. A visit to one of the SelfBuild shows about four years ago was extremely helpful, and following that we bought a year's worth of SelfBuild magazines and went through them carefully.' Accommodation consists of five bedrooms, four bathrooms, a cloakroom, cinema room, gym and a sunroom. Lighting is from recessed LEDs as well as some featured spots, the furnishings are equally uncomplicated. 'We went for a clean style, there's nothing particularly fancy in our house; the furniture is oak and so is the kitchen which is finished in a high gloss.' The couple's three children (aged 6 months, 3 and 5 years), have rooms with loads of innovative storage for toys present and future.

The principal, roadside, elevation is clad in stone, a natural theme that is carried indoors with floors of either tiles or wood (oak). Windows are aluminium clad argon filled triple glazed and the house is very airtight, having achieved an airtightness result of 1.17 air changes per hour at 50pa (n50). Ensuring that the house would be warm and comfortable without having to spend a fortune, was part of the Keane's design brief. A high level of insulation and underfloor heating on the ground and upper floors from an air source heat pump with a thermal store, have made this a ►



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Heat pump with thermal store

reality as between May and October the central heating is turned off. If needed, a wood burning stove gives a top up. The thermal store also heats the hot water cylinder which obtains additional warmth from recycling the air from the bathrooms and kitchen through it; at 21deg., 10deg of this can be taken up by the water. The air is drawn from these areas via a fan in the roof space, in the rest of the house Demand Control Ventilation operates via individually controlled external vents in each room which open and close according to the levels of humidity and CO₂.

Having come out the other side, what advice would Michael give to people thinking about building their own home? 'People tend to think they can do it themselves but it's important to ensure you get the professionals involved. I would thoroughly recommend an architect, ours was excellent. It's also really crucial to know exactly what's happening on site and don't be afraid to ask questions. There was one thing I spotted in the bathroom concerning the pipes which I thankfully caught in time, but if I hadn't, the tiles may have

ended up off centre. A good relationship with your builder goes without saying, we were lucky and trusted ours 100 per cent. We took on a number of his ideas and suggestions during the build and if we ever do this again, he would be our first port of call! So trust your own eyes and speak to your professionals. Read up and be knowledgeable about the process.' Michael recommends reading materials available from the CIF (Construction Industry Federation) and getting your hands on as many relevant magazines as possible.

If he could, would he go back and change anything? 'I probably would have made the utility room bigger, but I suspect this is something people always say! Apart from that, I think I would have put the plant room in the house rather than in the garage. Having said that and I know it's a cliché, but we really are living in the house of our dreams. We're very happy with it.' ■

Site size: 2.5 acres

House size: 4,500sqft/418sqm

Build spec

Walls: Twinleaf concrete block cavity wall with sand/cement render or natural stone cladding externally. 200mm cavity with blown platinum bead insulation. Internal finish: wet plaster finish direct to blockwork to achieve airtight line. U value: 0.15W/m²K

Ground floor: 100mm concrete screed incorporating underfloor heating circuit on 120mm PIR floor insulation on concrete subfloor. U: value 0.15 W/m²K

Upper floor: suspended timber

Roofs: Flat ceiling areas: 200mm glassfibre insulation between joists. 60mm PIR insulation and airtight membrane below joists. 150mm service cavity below airtight line to accommodate downlighters, etc. U value: 0.13W/m²K

Roofs: Sloped ceiling areas: 175mm glassfibre insulation between joists. 60mm PIR insulation and airtight membrane below joists. 50mm service cavity below airtight line to accommodate wiring, etc. U value: 0.14W/m²K

Windows: Aluclad triple glazed argon filled U value 0.7W/m²K

Catherine Doran

info The companies listed below provide products & services relating to this article.

Architect

Fergal McGirl Architects, North Great Georges Street, Dublin, tel. 01 873 5441, www.fmgarchitects.ie

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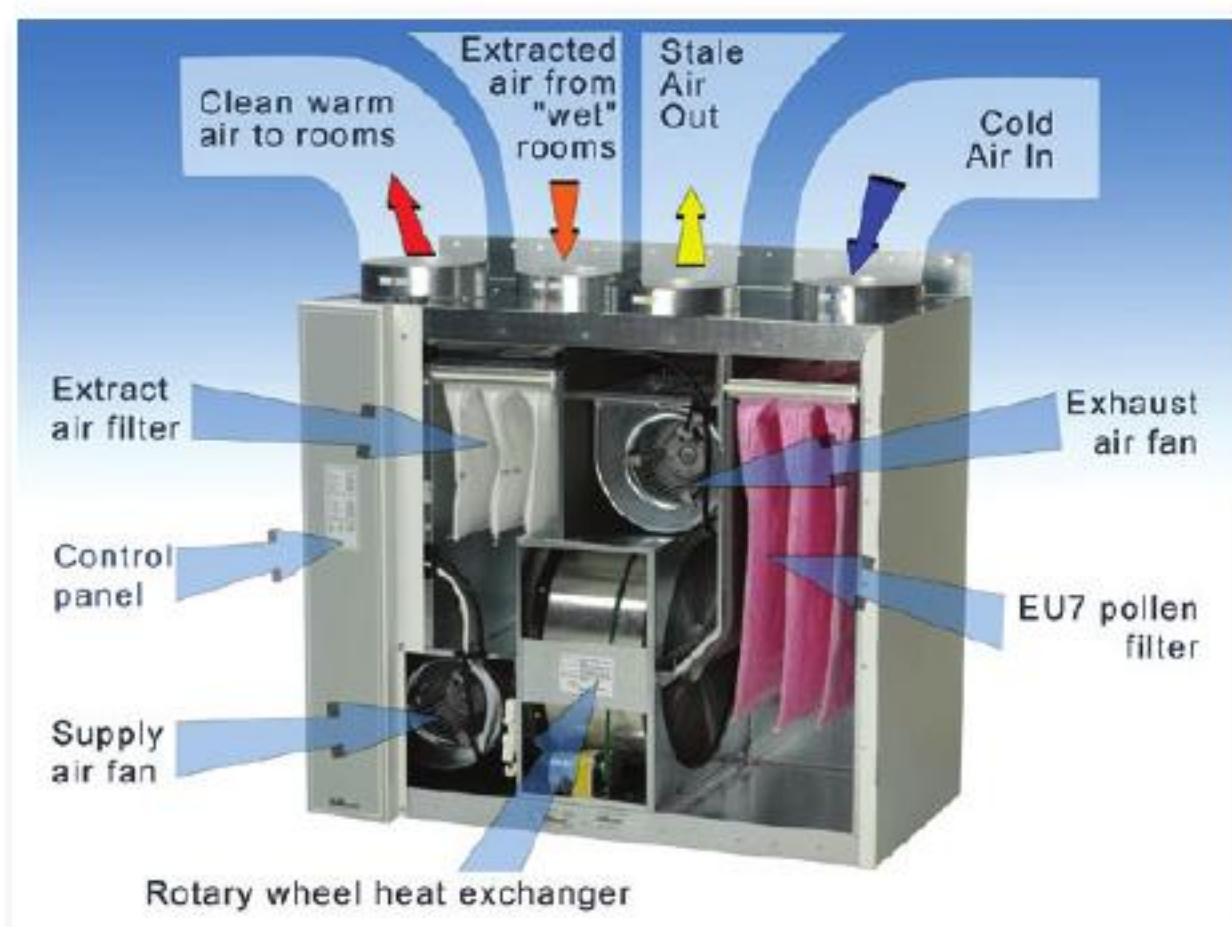
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La dolce vita

It's not just entrepreneurs who get their best ideas when relaxing on holiday, so do self-builders!

Colin and Barbara Barry had always wanted to self-build on a site with sea views, and when a large plot in Co Down completely open to the sea on three sides came up for sale, they didn't hesitate in taking this once-in-a-lifetime opportunity. When you have, as Colin and Barbara did, a very clear idea of the setting and type of house you want to build, getting it all together is quite a tall order. The germ of the plan took hold when the couple were on holiday in Italy, as Colin explained:

'We spent a holiday at Lake Garda in northern Italy and just loved the way the villas are built around the steep hillside bordering the Lake. The setting is fantastic and I knew exactly where, back home, we could get the same feeling, so when the site was put up for sale in 2006 we moved quickly to secure it.'

From the facades and layout of the house it is evident that the influence of Italy was more than a sense of place, the style is, as Colin described it 'Irish Palladian'.

'I love the symmetry of the ancient buildings



More photographs available at
www.facebook.com/selfbuild



in Rome and especially those of Andrea Palladio, but also, in the modern era, the fabulous Art Deco period villas on Long Island, New York state, and Miami.'

The result is a house with an international feel yet quite distinctively Irish.

Although new to self-building, the couple had plenty of experience of building as they had completely restored the house they were living in, a Listed building, and prior to that, renovated a modern house. In his day job, Colin has a background in large residential and commercial building. With this knowledge and interest, was it not tempting to do the designing himself? Colin was emphatic in his response:

'Designing and building a house are two very different things and I had no hesitation in using an architect. It was his job to make all our ideas work in practical terms as well as distilling our thoughts on style into a form that we were happy with and that would work. The architect we knew because he'd already built a house for my brother in the ►





area and the builder had worked for our family before on other projects. We were very fortunate in having these connections already established because it was quite a complicated build, and good communication and understanding were essential.'

Given the unusual design, its size and location, it would not have been a surprise to hear that gaining planning permission was a long, tortuous process, but not so. The site had originally been passed for the erection of two separate dwellings so



the change to one large family home represented considerable planning gain, and permission was granted following some minor adjustments to the design.

The house is of masonry construction using 9"/230mm concrete blocks laid flat for sound attenuation and to create thermal mass. With three teenage children, the couple were particularly aware of the importance of both of these!

'We wanted them to be able to bring their friends to the house but without us feeling as if we were living in a hotel!' explained Colin. 'The children chose what they wanted in their bedrooms which are large enough to have several people staying over, as well as which, on the top floor we have a multi-purpose room with a cinema screen; it's also a place to play loud music without everyone else hearing it. The concrete beams and insulation between the floors means we can still enjoy peace and quiet downstairs.'

The family were allowed a 'wish list' of what they wanted, which is at first glance surprising for what they left out.

'We have plenty of space for a swimming pool and tennis court' Colin continued, 'but nobody was enthusiastic. The tennis court we'd had at our previous house and I admit it was rarely used, the swimming pool might have been voted for if they'd been younger. Nowadays kids prefer to have their friends round or to go out.'

Predictably though, they all requested showers ►

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The question of using renewable energies was considered in the same way as the fabric and interiors, from a very aesthetic as well as practical point of view.

'We looked at having both solar panels and a geothermal heat pump, but the panels would have been an eyesore on the roof and the cost of digging down for the heat pumps was huge. What we have been able to do, apart from fully fill the wall cavity with insulation, is to use an air source heat pump for hot water in summer. Otherwise it is a mains gas boiler and, apart from an open fire in the hallway – which we've yet to use – there are gas fires in the living areas and it also powers the AGA cooker. Although it cost an extra £800/€1,020, we put in a management system for the AGA and that has proved very effective in controlling the timing and temperature.'

The warm roof construction ensures maximum use of the space inside and out with the projecting balconies a magical place to sit and watch the sun go down across the Lough and the hills beyond. As darkness falls, the blinds lower and curtains close; both are part of a system that's clever enough to adjust to the time of sunset throughout the year, automatically. Even if the weather is poor, huge windows, (these and the Bangor Blue roofing slates were among the more significant parts of ►



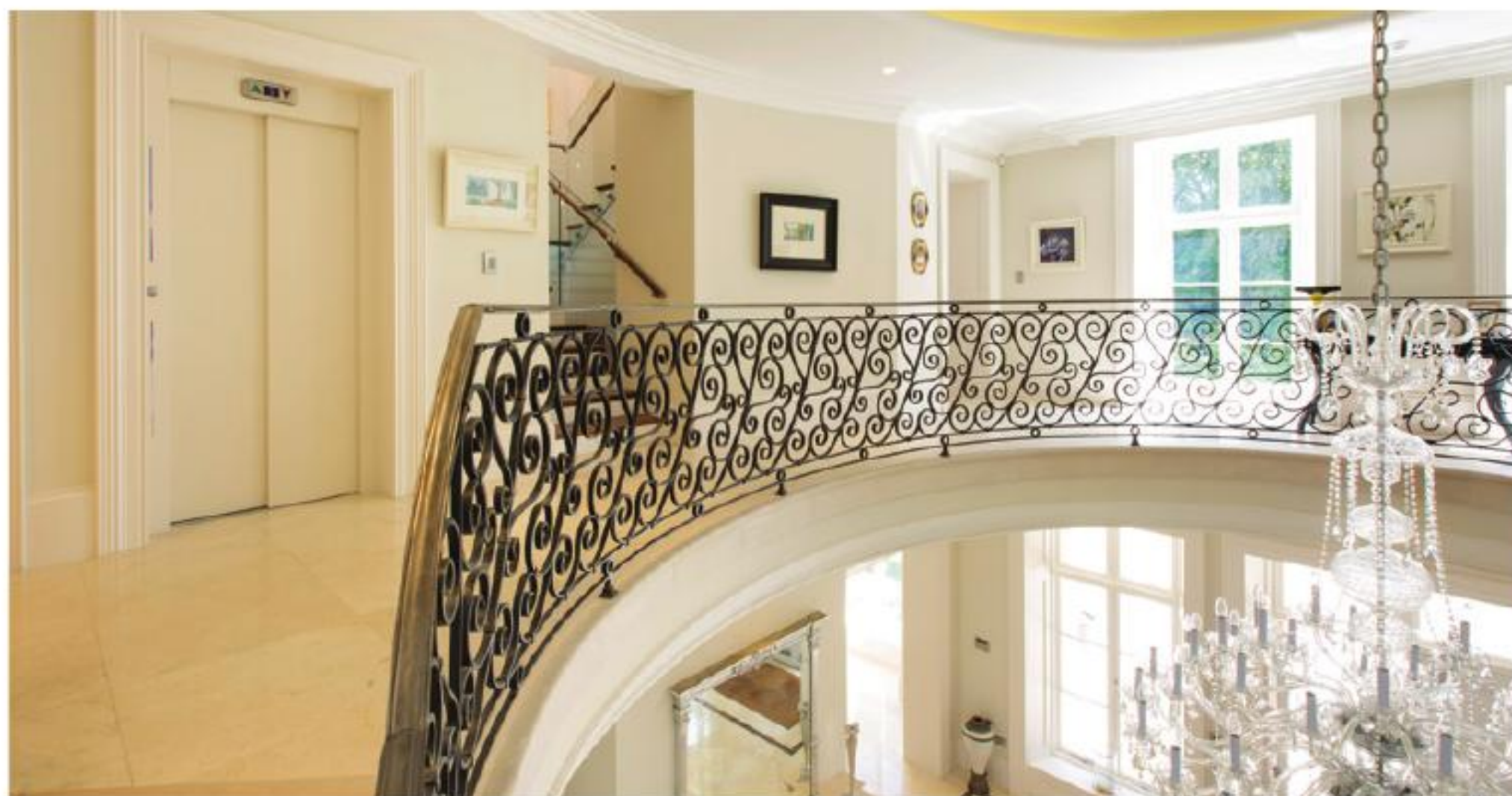


the build), provide almost the same experience. The curved glass in the projecting bays softens the seaward façade and contrasts with the geometric gables and tall rectangular chimneys. These curves are echoed inside with the wide sweeping staircase leading to a semi-circular balcony, giving access to the upper rooms.

Although Colin enjoys the challenge of construction, his particular interest lies in IT and, in addition to his day job and project managing the build, Colin also took charge of the networks. Cat 6 cabling throughout has future proofed the house for gadgets and gizmos yet to be invented, currently,

the system is fully programmable for everything from the heating to the time the electric entrance gates open and close. Much of Colin's contribution to the build is hidden, such as the exact detailing of the flashings and weathering, hugely important in an exposed situation like this. More obvious are the anti-slip bush hammered tiles on the balconies, another example of the thought that has gone into the detailing of this house.

Whilst her husband was keeping a watchful eye on site, Barbara was busy at her computer sourcing the fixtures and fittings for the interior, one of which is a stunning chandelier. Many a stately ►





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home owner must envy the motorised lowering for easy cleaning!

A Grand Design this home may be, but the use of marble flooring throughout and soft tones with splashes of colour create an interior whose stylish simplicity highlights the inventiveness of the design. Few changes were made in the course of the build, but one very visible as you walk through the front door, is the use of curved walls which just ask to be followed, to find out what lies behind and beyond.

In the classic 1960's film *La Dolce Vita*, the main character (a journalist), searches in vain for 'the sweet life' in Rome. If the film were to be re-created, then Colin and Barbara's wonderful house and location would provide the perfect set, only this time the story has a happy ending. ■



House size: c15,000sqft/372sqM

Site size: 2 acres

EPC: 83

Airtightness: 2.73

Build spec

Wall: 465mm: inner leaf 215mm concrete block/150mm cavity fully filled with Eco Bead blown insulation/100mm outer leaf. U value 0.13W/sqmK

Floor: 150mm K3 rigid thermoset phenolic insulation board, self levelling floor screed over underfloor heating pipes. U value 0.16W/sqmK

Roof: Warm roof construction: 150mm Kooltherm K7 insulation between rafters and 72.5mm Kooltherm K17 insulation below rafters. U value 0.15W/sqmK

Windows: Timber double glazed, argon filled U value 1.5W/sqmK. Timber triple glazed, argon filled U value 1.3W/sqmK

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Gillian Corry

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Spread across the world, they are built from many different materials and for a range of budgets. They do, however, have two things in common; outstanding and original design in the materials and the way in which these are combined to create a unique home.”



Seeing inside the box

When we visit someone else's house what we see is the finished product. Our eyes can only detect what is visible, often merely a decorative covering, on top of layers of materials.

What is hidden, as the authors of *Detail in Contemporary Residential Architecture 2* observe, are the ideas fixed in the form of a drawing, the best of which are elegant and simple; it is a shame that so often they are invisible once the building has been completed.

It is thus what lies underneath all the paint, wood and plaster that tells us not just how the building was built, but also why it was built in that way. The drawings provide an insight into the construction culture of the place where the building is situated - what is really vital in one location may be completely immaterial in another.

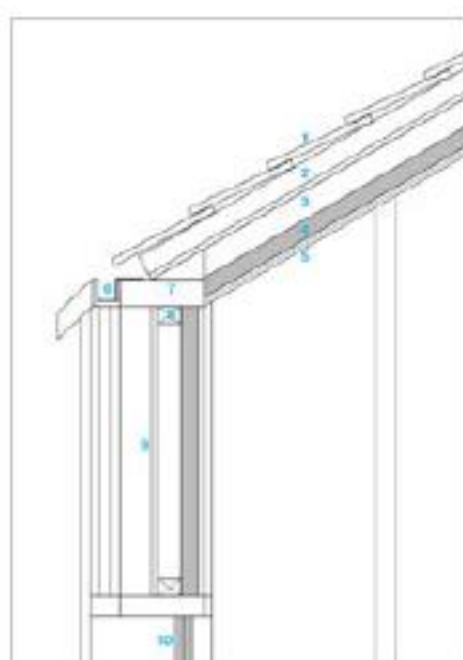
The following selection of properties are not all dream houses with vast budgets, rather they are realistic solutions to the housing needs of the individuals and their families for whom they were built, their design is also a reflection of their location. Each has been chosen because of a quality or an aspect of the design that is particular. Spread across the world, they are built from many different materials and for a range of budgets. They do, however, have two things in common; outstanding and original design in the materials and the way in which these are combined to create a unique home.

The homes featured are one example from each of the four categories of building materials; the book is divided into: wood, brick, concrete and other materials. Unusually, but in keeping with the aim of the authors David Phillips and Megumi Yamashita, the book contains a CD ROM of all the drawings for every one of the 50 homes described, some of which are reproduced in the text covering each property. The combination provides an unusual and fascinating insight into different methods of construction around the world. ►



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**Roof and South Facade Glazing
Section Detail 1:20**

1. 20 mm (3/4 inch) thick recycled roofing slates with traditional nail fixings
2. 60 x 72 mm (23/8 x 23/4 inch) timber roofing battens
3. 20 mm (3/4 inch) plywood
4. 60 mm (23/8 inch) thick thermal insulation
5. Two layers of 20 mm (3/4 inch) plywood nail fixed to structure and ceiling face, painted white
6. Zinc gutter fixed to timber frame
7. 300 x 950 mm (12 x 37 1/4 inch) timber framing
8. 80 x 70 mm (3 x 23/4 inch) timber battens
9. Two layers of 20 mm (3/4 inch) plywood nail fixed to structure and interior wall face, painted white
10. Fixed double glazing

Wood: House in Paderne, Spain - Carlos Quintans Eiras

This modest mountain house is located in north western Spain in an area with a rich architectural heritage, including medieval stone churches and shrines, Celtic castros or forts, as well as isolated hamlets and villages of small stone walled, slate roofed houses and barns. The architects began with what had been a traditional structure with an unsympathetic addition. This addition was demolished and the original thick stone foundation walls were then used as the base for a new, lightweight timber structure. The resulting two storey house has two bedrooms and a bathroom in the partly below ground lower level where the thick

stone walls lend a degree of solidity to these private areas. The new timber structure, which follows the orthogonal geometry of the base, encloses a single, open plan, high ceilinged living space. The kitchen is located on an elevated platform in the west corner of the plan, accessed from the dining and living area via a short flight of timber steps. A tall storage cupboard divides the kitchen from the stair and the entrance behind.

The south façade is almost entirely glazed, looking out over ancient stone walls and pasture in the foreground with the forested, rock strewn ridges and valleys of the mountain range beyond. Overall, the property provides all the accommodation required, it retains a strong connection with the landscape and architectural heritage yet is still very obviously modern. ►



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External and Internal Door Section Detail 1:10

- 1 140 mm (5 1/2 inch) thick engineered clay block wall
- 2 130 mm (5 1/8 inch) thick rigid thermal insulation
- 3 40 mm (1 1/2 inch) ventilated cavity
- 4 Timber door frame
- 5 Thermally insulated timber external door
- 6 Lowemissivity fixed double glazing
- 7 Brick soldier course
- 8 18 mm (3/4 inch) thick painted MDF internal wall lining
- 9 50 mm (2 inch) thick thermal insulation and vapour barrier
- 10 18 mm (3/4 inch) thick painted plywood
- 11 Timber wall framing
- 12 140 x 140 x 10 mm (5 1/2 x 5 1/2 x 3/8 inch) square hollow steel section
- 13 Custom wrought iron door hinge
- 14 Three 15 mm (5/8 inch) thick laminated plywood doors with satin paint finish

Brick: Villa Rotonda, Goirle, The Netherlands - Bedaux de Brouwer Architecten

Located near a busy and noisy road, this house is an outstanding example of location dictating form, but not at the expense of style; quite the opposite. The design cleverly uses the constraints to inform the shape, and at the same time has succeeded in the brief to create a quiet, comfortable home with as much access to natural light and open views across the landscape as is possible. The result is a house that is light and open to the garden at the back of the site and almost entirely closed towards the busy road.

Facing the street is a solid grey brick wall, punctured by a solitary window, which continues around the house to the north and west, creating a literal, visual and acoustic barrier. At the north-west corner, the wall appears to rise up out of a reflection pool that wraps around the corner of the house, creating a shallow moat to mark the transition between the private interior and public street. A wall of full height glazing overlooks the completely private garden and swimming pool to the south. Enclosing the garden, two wings extend from the front of the site, flanking the main house. The west wing houses a study, sitting room, master bedroom and bathroom, and an open air covered Jacuzzi terminates this flat roofed wing. To the east,

the garage and covered dining terrace complete the protective U-shaped plan.

The success of this home lies in the amount of thought that has gone into the design, interpreting a difficult site, where layout and materials play equally important roles in achieving a successful scheme.

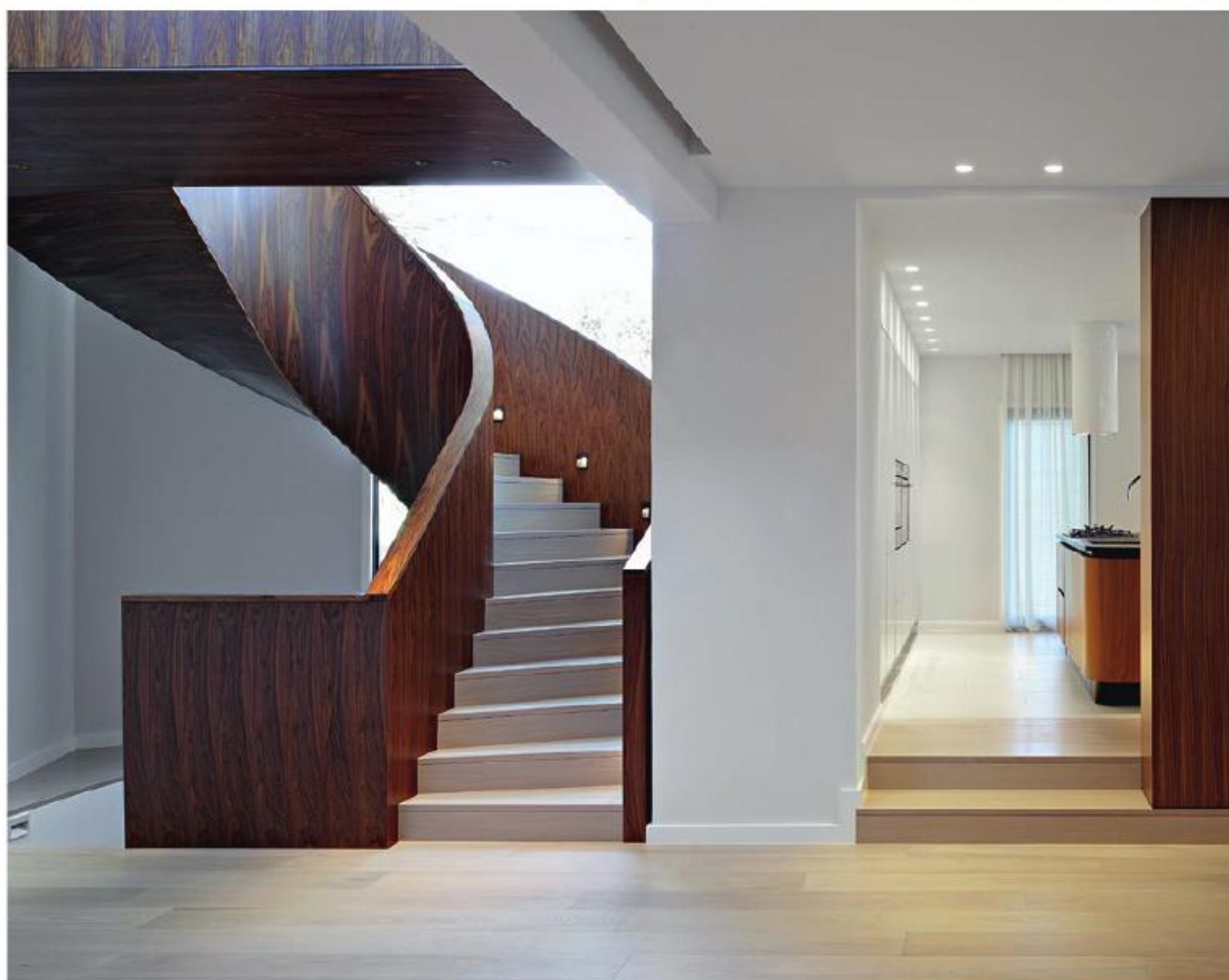


Concrete: Jelenovac Residence, Zagreb, Croatia - DVA Arhitekta

At first sight this house, located in a densely wooded residential area and within a cluster of mostly traditional homes, is very obviously ultramodern. But it is not that way to make a statement, the design has once again resulted from the geometry and location of the site and demonstrates very original thinking in the use of shapes and treatment of the fabric.

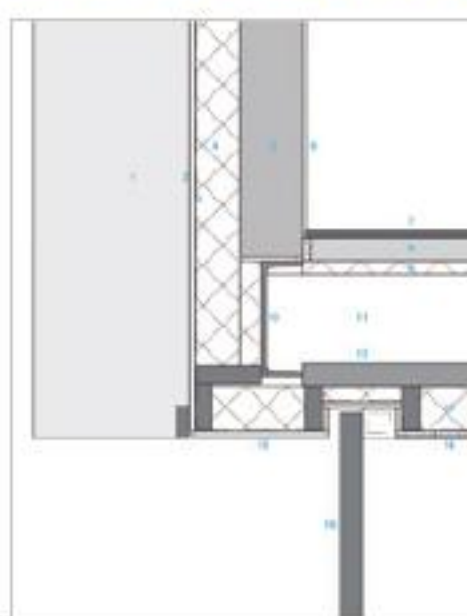
The gentle slope on which it is built continues into a public park, with a forest beyond, and the boundary between the two is marked by rubble stonework. This is used both as a perimeter wall and building podium, on which sits a bright, white, two storey cubic structure punctuated by deep-set, crisp black openings. This grey, black and white composition, rough where it touches the ground and smooth above, is in stark contrast with both the built and natural context.

Expressed as two unequal rectangular prisms, connected by a smaller volume in between, this hinge in the building allows it to follow the contours of the site and take advantage of a variety of views. On the ground floor the living spaces are in the larger volume with services in the smaller, whilst the private areas are located in the floor above. In the link volume, a sensuously curved dark wooden spiral staircase contrasts with the bright white oddly shaped geometric surfaces elsewhere in the house. It is a bold move away from the traditional designs of the area and one which perhaps points to a future of individuality, breaking away from the constraints of the past. ►



First Floor Plan 1:200

- 1 Bedroom
- 2 Ensuite bathroom
- 3 Sitting area
- 4 Terrace
- 5 Stair
- 6 Void
- 7 Ensuite bathroom
- 8 Master bedroom
- 9 Dressing room
- 10 Bathroom
- 11 Bedroom and study space
- 12 Bedroom and study space



Ground Floor Thatched Wall Over Garage Door Section Detail 1:10

- 1 Chinese thatch 350 mm (133/4 inch)
- 2 Waterproof plywood roofing substrate
- 3 Waterproof membrane
- 4 100 mm (4 inch) rigid insulation
- 5 140 mm (5 1/2 inch) timber framing
- 6 Painted plasterboard wall lining
- 7 Limestone flooring
- 8 Concrete screed with underfloor heating
- 9 Rigid insulation
- 10 Steel channel
- 11 Concrete screed
- 12 Concrete screed
- 13 100 mm (4 inch) rigid insulation
- 14 Plasterboard ceiling lining to basement over plywood and waterproof membrane
- 15 Painted MDF soffit lining
- 16 Garage door

Other Materials: Living on the edge house, Zoetermeer, The Netherlands - Arjen Reas

The thatched house – but not as we know it! Neither is it in a rural location, it is in a small city near The Hague. The sense of rural is key though, because it was designed for clients who work in the city but wanted to move their family away from the noise and crowds whilst remaining within commuting distance. It is a house on the edge between suburbia and the countryside.

In contrast to the concrete example above, here the architects wanted to emphasise traditional Dutch building forms and materials. Thatching, once a common building material, is currently undergoing a resurgence in the Netherlands and is used to great aesthetic and functional effect here to create a house that evokes both rural and urban living. Beginning just above ground level, the thick blanket of thatch cladding the building covers the walls as well as the roof and is only interrupted by the double height projecting entry canopy on the south-west façade, the chimney at the opposite end and a series of deeply set vertical windows sliced into the roof and walls.

Accommodation is on three levels, with four bedrooms and two bathrooms on the first floor within the pitch of the thatched roof. The living spaces are on the ground floor and beneath these a

basement houses the garage and generous storage space. Carrying the link with tradition internally is a fireplace in the main living space, either side of which are glazed doors which fold open to connect this room with the terrace and garden beyond.

As an exercise in traditional modernism, this house clearly has links with both the past and the future. The architects have achieved this by using a traditional material, thatch, in a modernist way to create a very dramatically different, yet familiar home. ■

Gillian Corry



Photography: Kees Hageman, www.keeshageman.nl

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Hemp: the answer to zero carbon homes?

It is widely accepted that in Ireland today there is a strong need for new homes to cope with our growing population and for the environmental impact of these homes to be drastically reduced.

Achieving these two aims means building houses now that meet strict criteria on energy, emissions and sustainability. If we are to take these seriously, we will need to change the way we build to one where we use materials and systems that not only save us costs in the future, but that we can afford to pay for now. I believe this will have to be a more dramatic change than many people are prepared for at present. The systems introduced over the last decade have largely been engineering solutions using combinations of existing materials in new ways, or new or improved energy technologies. The question is: is it possible to build zero carbon houses? I believe it is, and the answer is to use hemp.

Hempcrete hemp-lime bio-composite

Since the mid 80's there has been a growing market for hemp products, especially in the food and clothing sectors. hemp has very good ecological credentials as it not only helps the land it grows upon, it also provides products with many health related qualities such as high levels of nutrition from the seed or improved comfort/durability from insulation made from its fibres. The processing of the plant involves separating the seeds and fibres from the main stems, leaving behind the woody core of the stem in chipped form. These particles, called hurds or shivs, were formerly thought of as waste, but in France in the mid 1980's a man named Charles Rasetti came up with the idea of using them as an aggregate with a lime based binder to provide infill to the medieval oak framed house he was repairing. It soon became apparent the material had more possibilities than just Heritage repair and so was developed as a new build option when cast around a timber frame. This technology spread in the 90's to Switzerland, the UK and to Ireland where it has been used on a great variety of projects, these have proved its flexibility of application and signalled a promising potential.

Unlike other materials there is no particular 'look' to a hemp building, it can be built up with perfectly straight and level walls or manually

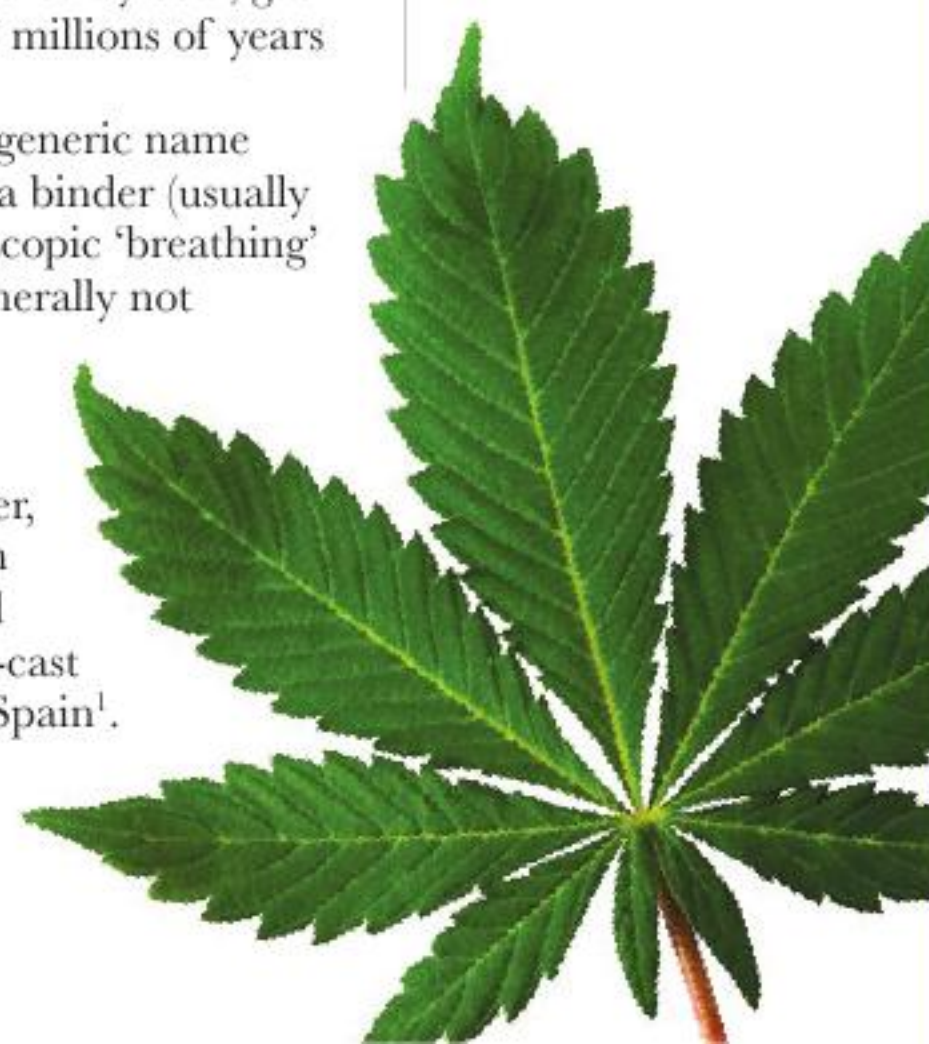


applied to give a hobbit house like appearance. Hempcrete thus has an advantage over materials such as straw bales or cob houses when it comes to the future marketability of the houses as they can have a very conventional style.

The use of hemp in construction raises issues over the direction we take to achieve sustainability goals. Are we to rely on depleting resources such as oil or steel or are we going to take the direction offered by bio based materials for absorbing CO₂ (annually for hemp, every 20 years for timber), rather than releasing the CO₂ stored by coal, gas and oil which took thousands of millions of years to accumulate?

Hempcrete has become the generic name for a mixture of hemp shiv and a binder (usually lime based), to produce a hygroscopic 'breathing' bio-composite material. It is generally not considered to be load-bearing and as a result is used to create a high performing envelope around a timber frame. However, load-bearing variations based on clay mixes which can be tamped or purchased in the form of pre-cast blocks, have been developed in Spain¹.

Although the insulating ►



¹ <http://chanvre-info.ch/info/IMG/pdf/Cannabric.pdf>



*Hemp house Co Kerry
with Irish mix*

*Hemp house Co Carlow
with Tradica*

www.hempbuilding.com

properties (k-value) of the various Hempcrete mixes produced are not quite as good as those for mineral fibre or foam, the thermal mass effect and exemplar thermal inertia (the ability to delay and smooth changes), helps to maintain a comfortable indoor environment and regulates humidity. Experiment is an essential process in developing all technologies and to make the concept regionally applicable, there will need to be variants suited to local materials to help reduce transport emissions. The basic properties of any binder used for Hempcrete are hygroscopicity (breathing and humidity buffering), sets fast enough to be practical on a building site and is strong enough when finally dry and set. The lime gives it porosity and is formulated to improve speed of setting. Materials with these characteristics are available around the world and can be combined to produce a suitable binder using variations of ingredients, most of which include hydrated or hydraulic lime but also other local or imported additives to improve performance. Calculations for a Hempcrete mix

show a negative carbon figure for a cubic metre of the material of around -100kg making it possible to lock up carbon in a hemp structure instead of emitting it. This figure can be improved with the use of more local or less CO₂ emitting materials, creating carbon sequestering possibilities to the construction industry world wide.

In Ireland there are at least 16 examples of complete houses built using this technology, each of them slightly different in the materials, design and methods used. This is quite a unique collection which provides a wide range of systems developed in the challenging conditions of the Irish climate.

I discovered Hempcrete in the late 90's when half way through building my own home and though too late to use it to build the walls, I learnt it could be mixed with increased binder to make a plaster. I experimented with it and the cottage type appearance I achieved was not only exactly what I wanted for my home, but was admired by friends and neighbours and I was soon supplying, and in some cases installing it, throughout Ireland.

Retrofitting

It is though in the areas of retro fit and renovation that hemp has been most widely used in Ireland. The uptake of Hempcrete materials here coincided with a wider understanding of natural materials in Heritage buildings and other 'green' concepts such as lime mortars and renders, the use of natural fibres such as sheep's wool or hemp and flax for insulation, and straw bale or cob techniques, some of which were often included in the projects. The overwhelming majority of these 200 plus builds in ROI and NI were self-builds. In many cases, owners were spending their weekends applying an insulating plaster to the stone walls (or cob, straw bale or clay block) of their homes and achieving a finish they were very happy with, having previously thought it beyond their capability.

With around 30% of our total energy consumption used to heat our homes, there is a huge retro fit sector where many houses are still in need of improved insulation. The health gains would also be considerable. In the UK, Bristol Neighbourhood Construction² have taken a community approach to this, demonstrating on their own homes how Hempcrete can solve insulation and condensation problems. These projects are used to train other neighbours in the hope that the knowledge will spread virally throughout the local community and further afield.

New Build

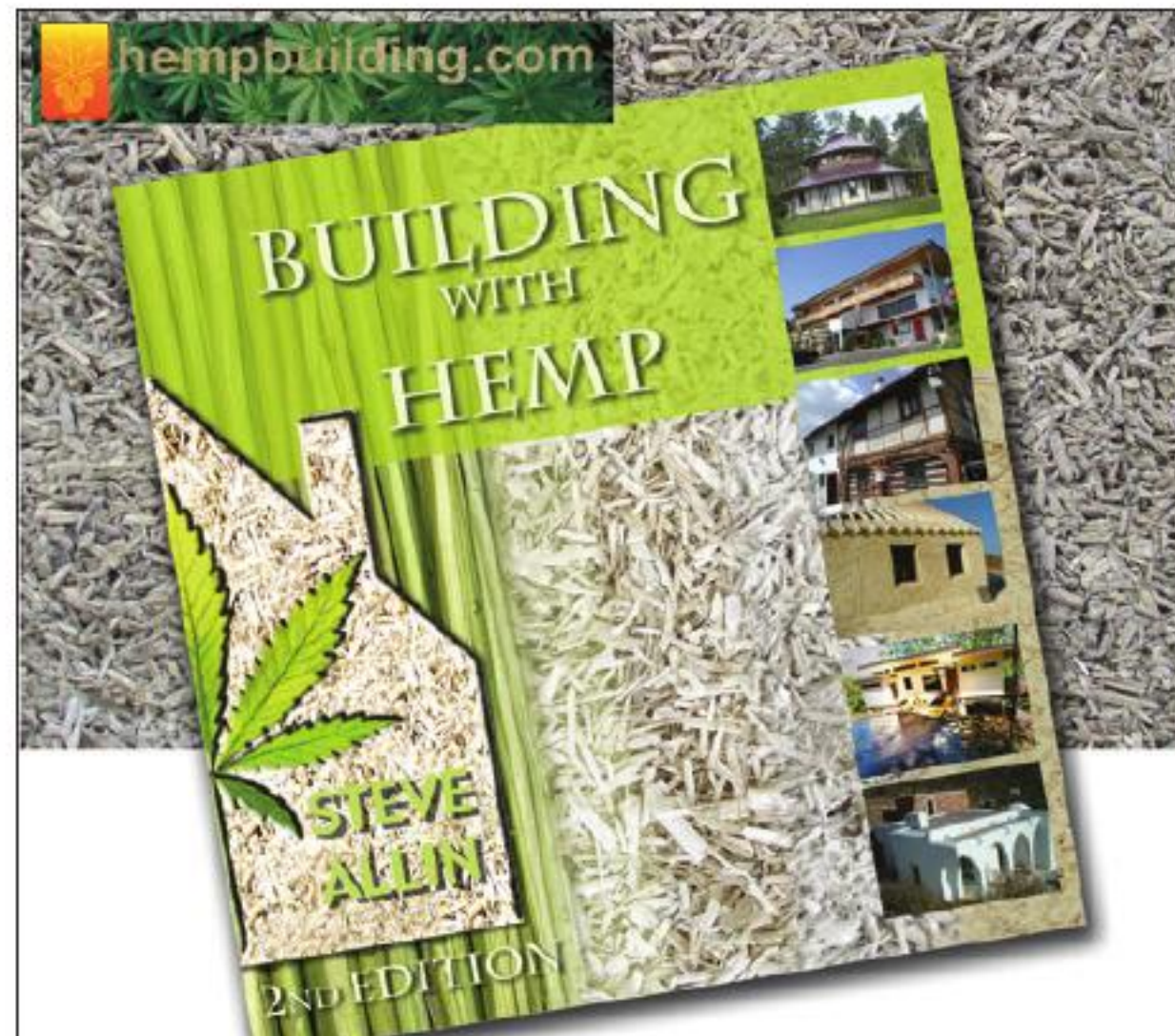
Building complete houses with Hempcrete involves codes and regulations being applied to Hempcrete materials, all of which have undergone extensive testing for the qualities determined by certification. The most commonly used mixtures will have similar characteristics as all commercially produced hemp is now of a suitable quality. Most binders will fall into an acceptable range of strength, density and porosity if made with appropriate ratios of ingredients. Specification for these performances ►

² http://www.salford.ac.uk/_data/assets/pdf_file/0017/142415/052-Wright.pdf - A study undertaken by Ranyl Rhydwen a lecturer at the Welsh Institute of Sustainable Education (part of CAT Centre at Machynlleth, Wales) who has developed the WUFI software package



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**Hemclad panels installed,
Cheshire Oaks, Ellesmere Port,
UK.**

**Photo; Ian Pritchett,
Greencore Construction
www.greencoreconstruction.co.uk**

and qualities is at present being devised by the International Hemp Building Association³. With a basic understanding of the material and application details it is not complicated for architects to adjust plans to use this material. Similarly, builders can achieve airtight walls as the monolithic structure is cast or sprayed into position leaving only the sealing around windows or door apertures.

By adopting a 'fabric first' approach, with Hempcrete it is possible to create a high performance building envelope which helps achieve passive house standards. This reduces the need for technology with limited lifespans such as solar panels or heat pumps. It also provides the possibility of opening windows without all the heat escaping, as most of it is stored in the fabric of the building and not just the in the air. Examples of hemp houses built to passive house standards or approach in the UK and France have proved that heating is not needed for more than a few days of the winter. However, for an accurate BER/EPC the unique qualities of Hempcrete will need to be included in the measurements to take account of the properties of thermal inertia and the added effect of latent heat produced by the evaporation and condensation of water vapour as it moves

³ www.internationalhempbuilding.org

⁴ <http://www.bath.ac.uk/news/2010/09/16/hemp-house/>

⁵ http://www.salford.ac.uk/_data/assets/pdf_file/0017/142415/052-Wright.pdf - A study undertaken by Ranyl Rhydwen a lecturer at the Welsh Institute of Sustainable Education (part of CAT Centre at Machynlleth, Wales) who has developed the WUFI software package - for a building containing both rammed-earth and Hempcrete structures

⁶ <http://www.habokus.co.uk/triangle/>

through the wall (phase-change phenomena), to give a true result⁴. Software packages with algorithms for these properties are already available allowing calculations of how the property will behave as a whole, taking into⁵ account aspects of humidity and passive gain not included in standard 'U' value calculations.

Hempcrete is also suitable for multiple unit or modular building projects. The Triangle project in Swindon⁶ is a fine example of this energy saving in practice where the rows of terraced houses built around the central triangular green have, not chimneys, but ventilation towers. Kevin McCloud, whose company developed the project, was delighted by the low level of noise during construction and the resulting site safety for workers due to the simple installation process.

For a hemp building to achieve the equivalent of CSH (Code for Sustainable Homes) Code 6 status the production of hemp will need to be established in as many locations as possible. With no reliable supply of Irish hemp as yet we are currently reliant on producers in Yorkshire and France. Of course the importation of this to Ireland is just as unsustainable as bringing the fuel to make cement or steel and many other products, however the projects built in Ireland using imported materials do prove the concept and show what could be done. Producing hemp suitable for construction in Ireland is certainly a possibility as research for a number of years has shown, it only needs the investment to make it a reality. We also have locally sourced products that can be used to make a purely Irish Hempcrete binder, so a material that has real sustainability potential is possible in the near future. ■

Steve Allin

Environmental Design Consultancy, Kenmare
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Additional information

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Finding a site

Building a house to your own design and specification is the dream of many people. But like all ideals, it can be difficult to achieve. Individual building sites are not easy to find and you must work that bit harder to secure a good one.

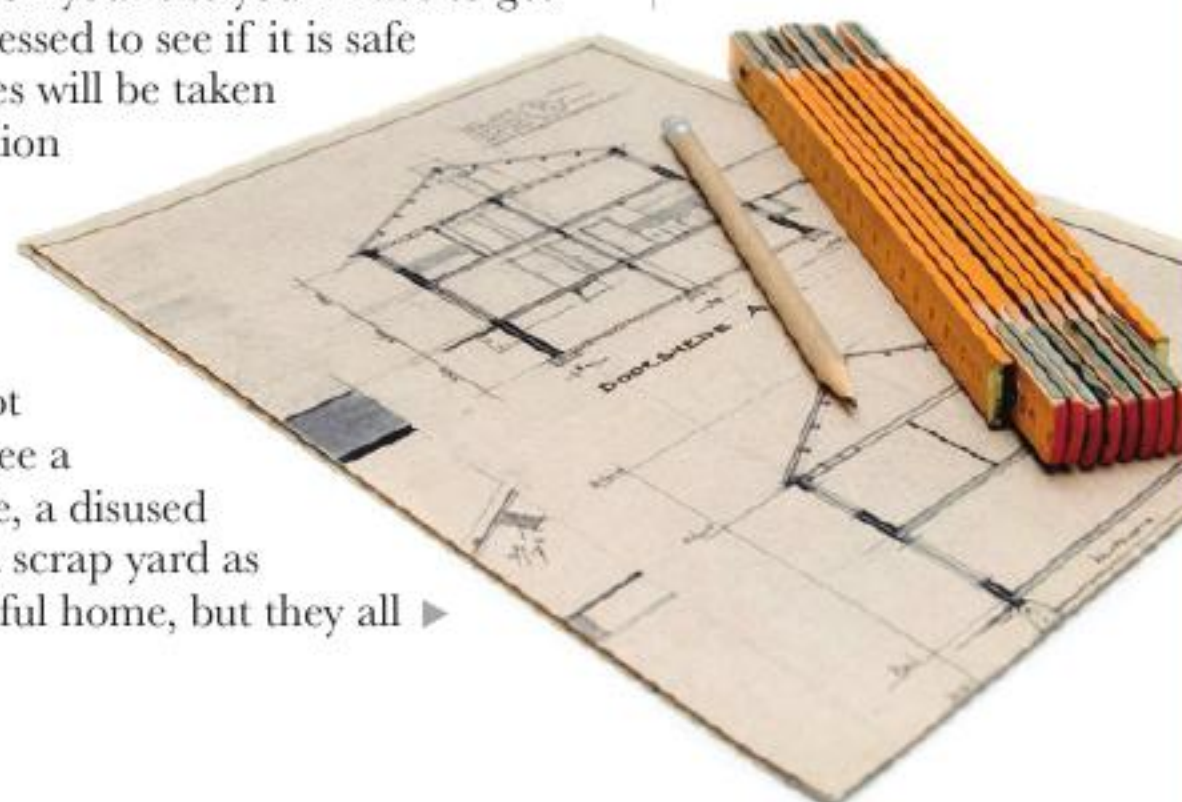
Finding the right site to build your house on can be difficult. It's a process that isn't recommended for the timid; some people tell stories about searching for years and this is true for many, especially if you're particular about views, privacy, the need for extra land and all the other variables. It's not that sites aren't available, the problem is accepting one that is less than your dream. You may also have to revise your thoughts about the type of house you want to build. If what estate agents say is true about location, location, location, then the approach most likely to succeed is one that begins with finding the site, and it's only then that the design can be brought into play. Flexibility, combined with the ability to focus your time and energy on the hunt, will give you the best chance of success.

*Silent Valley, Co. Down
Photo: Christopher Hill
www.scenicireland.com*

Types of site

A **greenfield** site refers to land that's not been built on before - whether in open countryside, gaps in rural areas, on the outskirts of villages or between existing houses. **Brownfield sites** as defined by NI Planning Service, are those 'in the built-up areas of settlements that have potential for development, and that includes previously developed land, undeveloped land and vacant buildings'. It's important to note that by definition, a brownfield site is not heavily contaminated, otherwise it would not be considered for development. If you suspect soil contamination on your site you'll have to get it professionally assessed to see if it is safe to build on. Samples will be taken and a course of action recommended.

Disused land and brownfield sites are very easy to miss. It takes a lot of imagination to see a telephone exchange, a disused industrial unit, or a scrap yard as the site for a beautiful home, but they all ►





could be, subject to planning approval. Technology has also helped with the development of mini piling systems and tanking for example, both of which could make a problem site viable. Building on agricultural land is a possibility but many areas in ROI have qualifying conditions. Some counties

will require you to have spent a substantial period of your life living in the area, referring to farmers,

their sons, daughters and/or anyone taking over the ownership and running of the family farm. If your background isn't farming, then sons and daughters of non-farming persons who have spent at least five years living in the area and wish to build within 5km (3 miles) of the family residence will be considered. Returning emigrants who had spent at least five years living in the area in which they propose to build can also apply to build on agricultural land.

These can include those wishing to reside near other family members, carers for

elderly immediate family members, working locally or retiring.

In NI high quality agricultural land is viewed as an important resource so the planners favour maintaining compact settlements, directing development to areas of poorer agricultural quality land and encouraging the re-use of redundant or derelict land. As obtaining planning permission for a greenfield site in an open area is therefore difficult, these sites are rare.

To find out if a site is viable, it's important to check your council's Development Plan and any Local Area Plan for the locality, in particular for policies restricting/permitting development in certain areas. These might include greenbelt, coastal areas, rural housing control zones etc. You should also keep an eye out for maps covering Scenic Amenity, Natural Heritage Areas (NHA), Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Areas of Geological Interest. Archaeology policies relating to the site you have in mind should also be noted. If your site falls within any of these areas, you should take advice from the Council Planning Department before proceeding to purchase.

In NI, a new building in the countryside will only be acceptable if it:
Blends sympathetically with landform, uses existing trees, buildings, slopes or other natural features to provide a backdrop, is an identifiable site with long established boundaries separating the site naturally from the surrounding ground and it does not spoil any scenic aspect or detract from the visual appearance of the countryside.

Existing house

Buying an existing house and demolishing it is another option which does tend to put the cost up. You may think that planning permission is more likely, but beware of trying to replace it with either a taller or larger dwelling, or not exactly on the footprint of the original; all the normal caveats of planning permission in your area still apply. Neither does buying an existing dwelling guarantee ground ready to build on, but the fact that a building is there does mean it is less likely than with a greenfield that the ground will be poor. Also, the 'good' ground may only lie exactly where the house was built and if your design is wider than that you still could face expensive foundations.

Historic buildings

If the building is Listed (NI) or a Protected Structure (ROI) there are separate and strict guidelines about what you may and may not do. Planning permission is needed for work carried out that would materially affect its structure so you may not be free to create the design you wish. If in doubt, write to your local authority (ROI) for a declaration under Section 57 of the Planning and Development Act 2000 about the structure and its curtilage (land and outbuildings immediately surrounding a structure which is (or was) used for the purposes of the structure). This declaration states what types of work can be carried out without affecting the character of the structure, and in addition, the normal rules on planning ►

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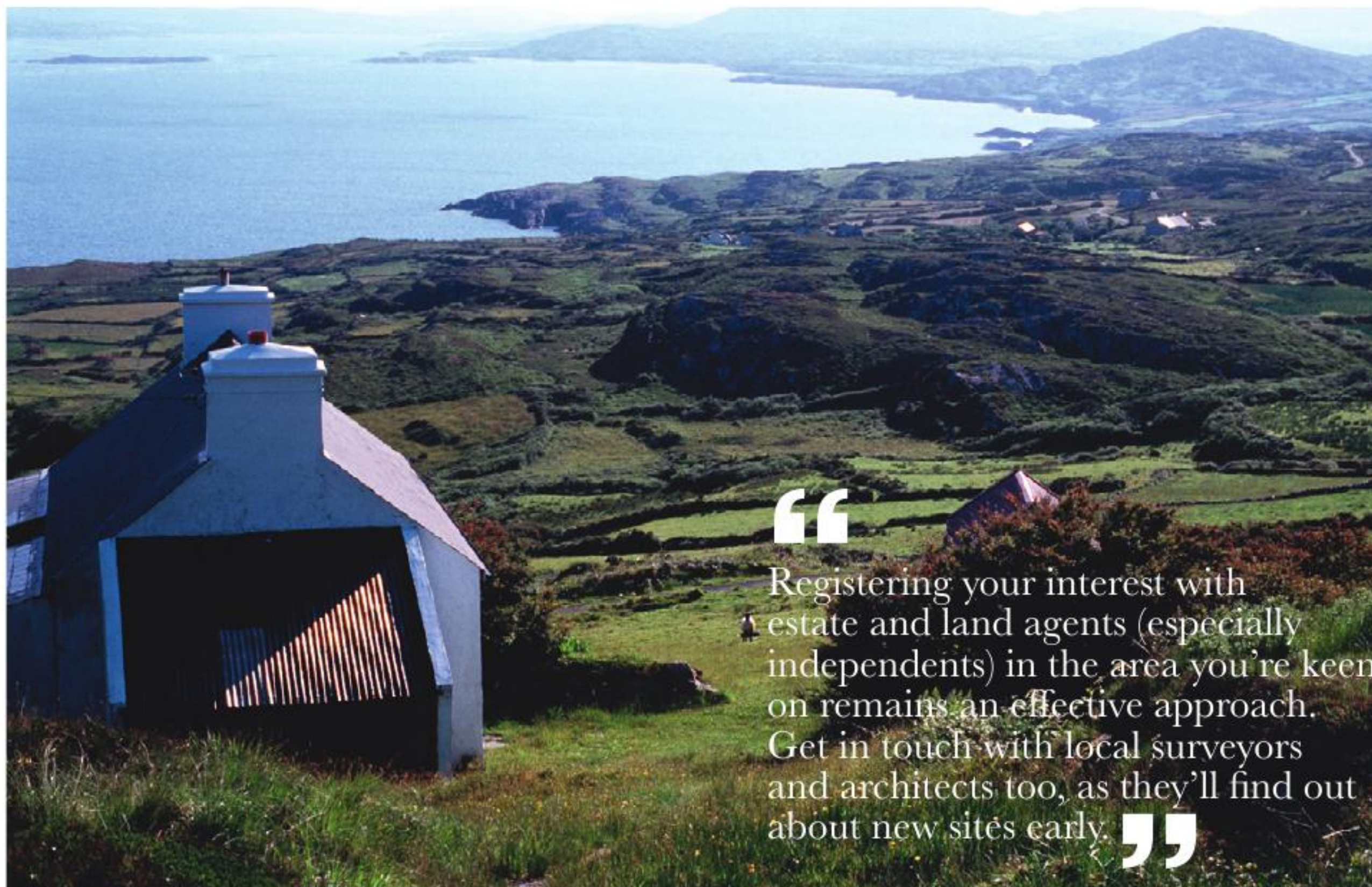
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“

Registering your interest with estate and land agents (especially independents) in the area you're keen on remains an effective approach. Get in touch with local surveyors and architects too, as they'll find out about new sites early.

”

permission apply. The declaration will be available to you within 12 weeks of receiving a request, there is no fee. If you disagree with the declaration you can appeal to An Bord Pleanála.

In NI consent will normally only be granted for extensions or alterations to a Listed building when all the following criteria are met:

- The essential character of the building and its setting are retained and its features of special interest remain intact and unimpaired.
 - The works proposed make use of traditional and/or sympathetic building materials and techniques which match or are in keeping with those found on the building
 - The architectural details (e.g. doors, gutters, windows) match or are in keeping with the building.
- Many listed buildings can tolerate some degree of thoughtful alteration or extension so may work as a site if the situation is what you are looking for. It's a case of weighing up if you will be allowed to do enough to the building to create the type of home you had envisaged constructing from scratch. Always bear in mind that what appear insignificant alterations to you may not be the view of the Council and Department of the Environment.

Finding your site

Unfortunately there is no single route to follow here, and Lady Luck plays her part as well! The wider the area the greater the choice - but you also run the risk of overlooking something. Make no mistake, site hunting is hard work and with the advent of the internet, there are even more avenues to explore. You may think some are a little far-fetched but in the search for your perfect site don't

rule anything out.

Registering your interest with estate and land agents (especially independents) in the area you're keen on remains an effective approach. Get in touch with local surveyors and architects too, as they'll find out about new sites early. The internet is a good hunting ground as well as it's where you'll find private sales in addition to full listings from some, but not all, estate agents. Newspapers both national and local are worth exploring but the cost of a print advertisement compared to an online listing means many properties may only appear once, if at all. Exploring the area on foot or driving around slowly gives you time to spot a For Sale sign now buried in a hedge, see laneways and visit local shops, pub, post office and newsagent all of which can provide vital information. You can leave an address and contact number or put an advertisement yourself in their window. Knocking on doors can produce mixed responses, some people are keen to help, others view it as an invasion of their privacy, but if you don't ask you don't get as the saying goes. A less overt approach is to write to the householders and/or their neighbours. The owners of large gardens may not have realised their potential as a building site for example. Keep an eye on planning applications for outline approval especially as this indicates a site but not one with the design for a house, and therefore a purchase possibility for you. Finally, and this is especially useful in rural areas, an OS map will show tracks and roads you may not be aware of. If all else fails, chartering a light plane to cover the area you want to build in to spot possible locations not easily seen from the ground may ►

*Silent Valley, Co. Down
Photo: Christopher Hill
www.scenicireland.com*

sound far-fetched, but it could make the difference between success and failure. Mark potential sites on a map to follow up later.

Property finders

It's not just the rich and famous who use a Property Finder to find them a house to renovate or a site to build on. Given the amount of emotional capital and financial outlay involved in building, it's a small price to pay for that perfect spot. If you are time poor or live some distance away from where you want to build, then they are well worth consideration. With local knowledge and experience they are able to root out ones that don't meet your criteria and perhaps hear about sites on offer privately and not in the public domain, known as 'off market'.

There is no formal qualification for being a property finder although many have a background in estate agency or estate management, but being interested in people and experience in the property market in general are essential. They are not all surveyors although good agencies will insist on staff having a background in this or a professional qualification, and it is helpful if they have a database of professionals such as surveyors who you may need to call upon to establish the viability of a site or house. Be wary of estate agents who describe themselves as being property finders as well as surveyors because you can't do the first two and be impartial, whilst the third is a specialist task, especially with older properties.

A property finder will give you invaluable advice on the best street in a residential area, proximity to amenities and even help you to see the potential

in a home that requires some up-dating. A good property finder will also ensure that you pay no more than market value in relation to current trends.

A retention fee (which depends on the price range but will be in the region of €250 – 1,500/£200 – £1,200 plus VAT), will be charged which is normally for an initial search over about three months. If nothing is found, you can let it rest for some months and then try again, or pay a retainer to be notified of potential properties but without engaging the full service. That way you won't miss anything although a good property finder, who will normally also expect a success fee, will notify you anyway.

The fees cover contacting all possible sources and driving around your chosen area for places that have not been advertised but are the subject of local knowledge. Potential properties will be viewed, photographed, notes taken and, preferably, the vendors interviewed. The purpose of this is to discover background information which could be of critical importance, and they will be more willing to give this to a property finder who they know has an interested client. All this information is then sent to you by email if possible, for speed, and viewings arranged. More sophisticated agencies have a content management system where clients have a user login that allows them to keep track of what their property finder is doing, and to view all the information and photographs gathered to date.

Plot potential

Large gaps between and behind houses – it's usually easier to get planning approval for development in between, or next to, an existing house. If there is space beside a house, or a large back or side garden with vehicular access, it is a potential site. Beware though of 'ribbon development' on the outskirts of villages which planners will not allow, currently the aim is to have clusters of habitation. Remember also that planners are unlikely to look favourably on a design that is out of step with the surrounding houses and if that is your primary reason for building, choose an area that is appropriate for your plans. From a purely economic perspective, the way houses are valued means that it is less economic to build a house that is massively disproportionate to those surrounding it. You can end up over-developing, that is spending far more money on a house than you could ever sell it for; or under-developing, that is building too small a house and failing to realise the full potential of the site. On a practical note, bring a camera to record what you have seen and details of where it/they are.

Plot pitfalls

A ransom strip is the name given to a small - it could be a matter of less than a metre - area of land belonging to someone other than the vendor of the site but which, in order to build, you will need to either purchase outright or pay an amount to use. Never rely on a handshake or word of mouth agreement, you must have a legally binding document.

Restricted covenants are more often found in ►



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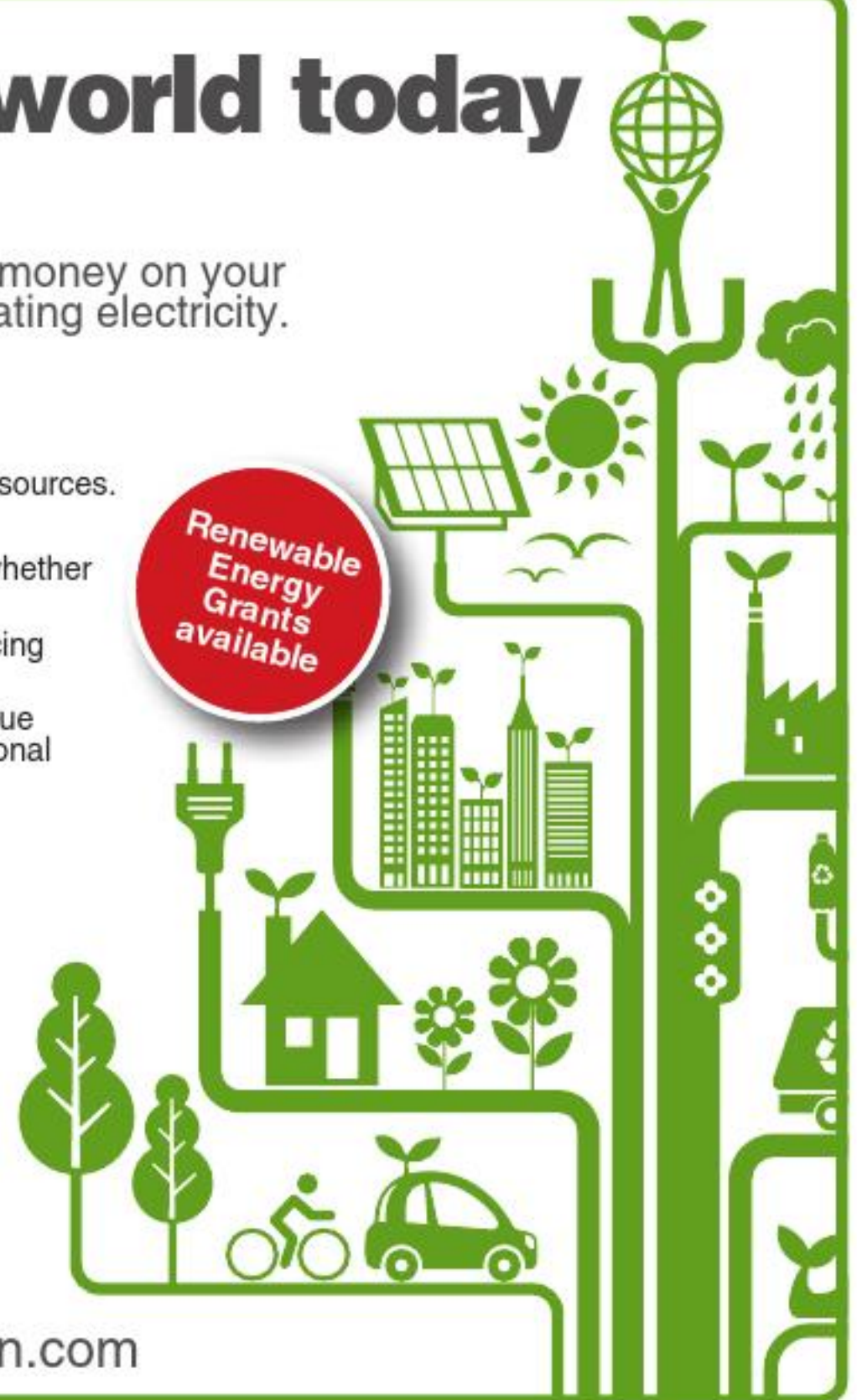
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suburban rather than rural situations, particularly where there was a large house whose demesne has been gradually built on. They tend to cover such things as the position of windows, where you can have access from, boundary hedges, ridge heights etc. Ideally you want to be able to have the covenant removed, but that is not always certain and it may also be time consuming and expensive.

Another unforeseen expense is the cost of connection to mains services such as water and electricity; connection to the main sewer in a suburban situation is usually relatively straightforward. Distance is the main problem with the first two, the further you are away from a connection the more expensive it becomes. In rural areas, if you are planning to use a soakaway system for waste water you will need to ensure your land is suitable; few people will allow you to use theirs or

Useful websites

www.daft.ie
www.property.ie
www.myhome.ie
www.donedeal.ie
www.formerlory.ie
www.sellityourself.ie
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www.countrysidesites.co.uk
www.uklanddirectory.org.uk

discharge into a watercourse on their land.

A more recent addition to this list is the presence of radon gas. Dealing with this is straightforward and you won't be able to test for it until the house is built, but if this is a concern, check out the level in the area.

All sites, whether rural or suburban, will be covered by the zoning and planning policies set out by the local council and available to view at their offices. It's time well spent studying these to check if the type of house you want to build and the site you have chosen are likely to be acceptable to the council.

Legal issues

There is only so much you can do 'on the ground' to find out if the site is suitable and worth the asking price. If all your questions have received the right answers the next step is to engage a solicitor who will make all the necessary checks over ownership, boundaries - in fact everything affecting the title and your ability to build and live there. This is crunch time as it is sometimes only when you get into the finer detail do you discover, for example, that access is shared by a local pig breeder or that planning permission has been passed for a factory at the foot of the lane.

Finding the right site is, for most people, hard work and time consuming. Given the investment you are about to make in the build, that cost and effort, as you will discover, is valuable experience for the next part! ■

Gillian Corry and Catherine Doran

Additional information:

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Good connections

If you like the idea of being self-sufficient in electricity (off grid), or doing your bit for the environment to slow climate change, or simply want to reduce your long term electricity costs, you may be wondering about small scale renewable power generation.

This article briefly examines the main renewable technologies that generate electricity¹; Solar Photovoltaic (PV), Wind Turbines and Micro - Hydro, their energy sources, their operating principles, planning permission and grid connection and income. Note that there are considerable differences between NI and ROI with regard to planning permission, grid connection and financial incentives. In NI both the equipment and the supplier must be accredited under the Micro-generation Certification Scheme for projects <50kW to avail of financial incentives.

SOLAR PV

Energy source: PV systems capture the sun's energy using photovoltaic cells. These cells don't need direct sunlight to work – they can still generate some electricity on a cloudy day. The cells convert the sunlight into electricity. The amount of energy received depends on the pitch and orientation of the panels. Solar energy is predictable and varies by a small amount from year to year, knowing how much you are likely to generate annually is relatively simple.

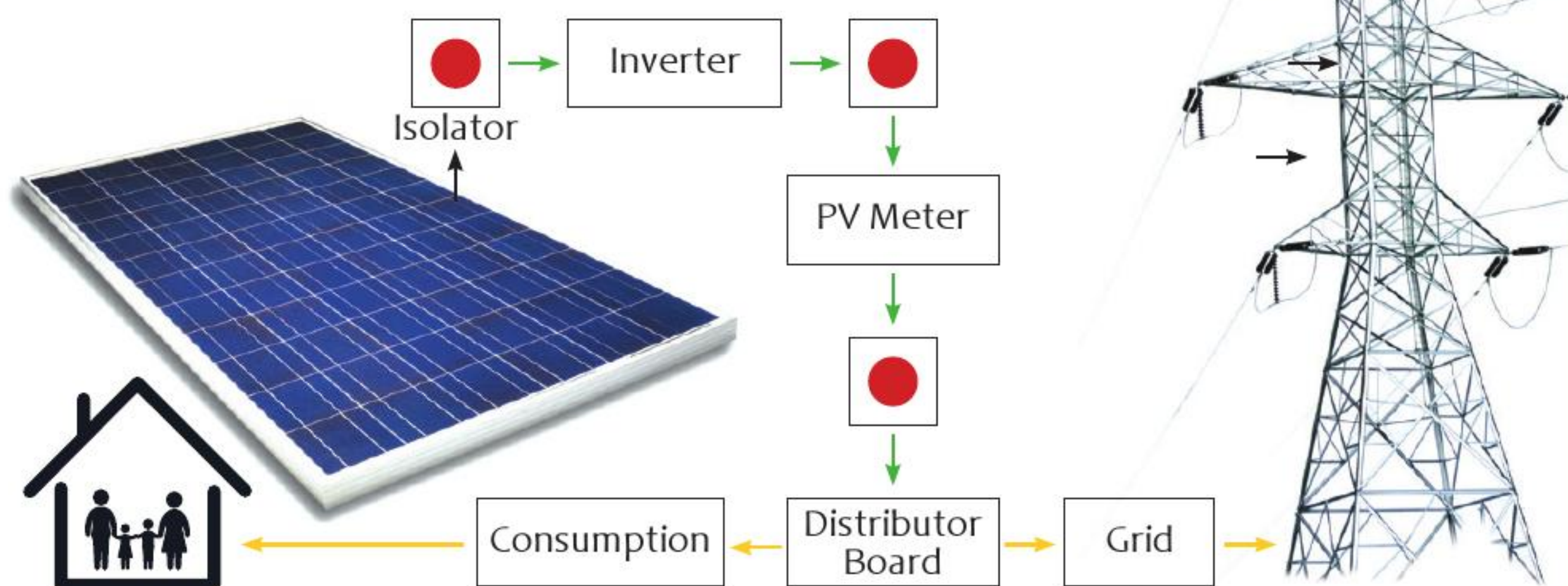
Operation: Every solar PV system is made up of several components: solar panels (modules), inverter(s), a meter and your existing consumer unit. The process is as follows. The sun produces radiation during daylight hours. The PV cells on the panels turn this radiation into direct current (DC) electricity. The current flows into an inverter, which converts the DC to alternating current (AC) electricity. AC is compatible with the main electricity grid and most electrical appliances; it is ready to use. The current is fed through a meter and then into your consumer unit. Plug in and switch on! Your system will automatically use the free electricity you've generated and top-up from the grid as needed. Any electricity you don't use is exported to the grid for others to use.

Planning permission

1. NI: Roof mounted PV systems do not need planning permission provided that they meet some basic criteria. All ground mounted systems require planning permission².

2. ROI: SI83 of 2007³ and SI 235 of 2008⁴ allow exemption for certain renewable technologies ▶

Figure 1 (below):
A typical solar PV layout
(image courtesy of
Element Consultants,
www.elementconsultants.co.uk)



¹ Combined Heat and Power is not covered in this article.

² www.planningni.gov.uk/index/advice/advice_apply_homes/advice-householders-guide.pdf

³ www.environ.ie/en/legislation/developmentandhousing/planning/filedownload.1486

⁴ www.environ.ie/en/legislation/developmentandhousing/planning/filedownload.1803



A domestic wind turbine

from planning permission. At micro-generation level exemptions exist for both roof mounted and ground based solar PV arrays as long as they meet certain criteria.

Grid connection

1. NI: For a typical domestic property with a single phase electrical supply, an array of $<3.68\text{kWp}^{56}$ is deemed as micro-generation and may be fitted without making a grid connection application. The installer arranges connection under a 'fit & inform' scheme. Connection is free of charge. For installation $>3.68\text{kW}$ single phase or $>11\text{kW}$, 3 phase, the installation is deemed 'small scale' and a grid connection application must be submitted. There is a fee for the application and for connection. The grid infrastructure in NI is weak and, in many places, is now at capacity for connection of generators. NIE publish a 'Heat Map'⁷ that describes the status of the grid across NI and you should consult this for any proposed project deemed 'small scale' or larger.

2. ROI: The system is more complex in ROI. You must apply to ESB networks for permission to connect a micro generator ($<6\text{kW}$ single phase, $<11\text{kW}$ 3 phase¹²) using Form NC6; they will inform you if they have any objections. You must

accept and pay for the ESB quotation for fitting an import/export meter and submit your ETCI electrical certification after which ESB will fit the meter. However, at present there is little demand, if any, from the electricity companies for purchasing electricity in this way so make sure you have a firm commitment before outlaying the cost of an import/export meter. The best approach may be to look at alternative uses or storage options for any excess electricity.

Solar PV is a key technology because it can be applied to almost any roof that points in the right direction⁹; it requires no annual maintenance¹⁰; it is self-cleaning¹¹; it has a long life span¹²; and it can be deployed rapidly¹³.

WIND TURBINES

Energy source: The warmth from solar energy creates the thermals that energise the wind. Wind power is thus a form of solar power, and it is very variable. It is affected by obstacles in its path and therefore becomes more powerful the further away the blades are from obstructions. The power available in the wind is proportional to the cube of its speed; if wind speed doubles, the power available to the wind generator increases by a factor of 8 ($2 \times 2 \times 2 = 8$). As wind speed is variable and

⁵ 4kWp in practise.

⁶ kWp = Kilowatt peak stands for peak power. This value specifies the output power achieved by a Solar module under full solar radiation (under set Standard Test Conditions).

⁷ www.nie.co.uk/connections/generation-connections/small-scale-generation/11kv-network-heat-map

⁹ South facing roofs receive more radiation throughout the year and will produce the maximum energy output. The ideal roof will have an orientation due south. However South-East and South-West orientated roofs will still produce high solar yields.

¹⁰ Inverters should be replaced around year 15

¹¹ On roof pitches $> 5^\circ$.

¹² Probably > 25 years

¹³ For more detailed information in NI see <http://secure.investni.com/static/library/invest-ni/documents/solar-photovoltaics-a-best-practice-guide-for-businesses-in-northern-ireland.pdf> In ROI see http://www.seai.ie/Publications/Renewables_Publications/Solar_Power/Best_Practice_Guide_for_PV.pdf





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site specific it is quite difficult to predict generation accurately. One method is to erect an anemometer on the proposed site and take readings over the next twelve months to give a prediction of what you might expect in future.

Operation: Wind turbines are the opposite of electric fans. Instead of using electricity to make wind, like a fan, wind turbines use wind to make electricity. The wind turns the blades, which spin a shaft, which drives a generator and makes electricity. In most cases, the system is the same as Solar PV after the inverter. The power output of a wind turbine at different wind speeds is described by a power curve. Most domestic turbines are sold as 'packaged plants' including all components up to the grid connection.



Top: Poncelet Wheel
Below: Archimedes Screw
Freeflow 69 Ltd.
www.freeflow69.com

Figure 2 (right): Renewable energy comparisons

Planning permission

1. NI: All wind turbines in NI require planning permission. There are objective and subjective factors that affect whether or not your application

will be successful. Objective factors include noise levels, clearance for bats, radio fixed links, road and power line clearance. Subjective factors include visibility and local planning policy interpretation. If a turbine fails to meet any of the objective criteria the planning application is likely to fail.

2. ROI: Exemptions exist as for Solar PV above. In the case of micro generation domestic wind turbines, the turbine must be <13m high with a rotor diameter of <6m. Noise conditions and clearances also apply.

Grid connection:

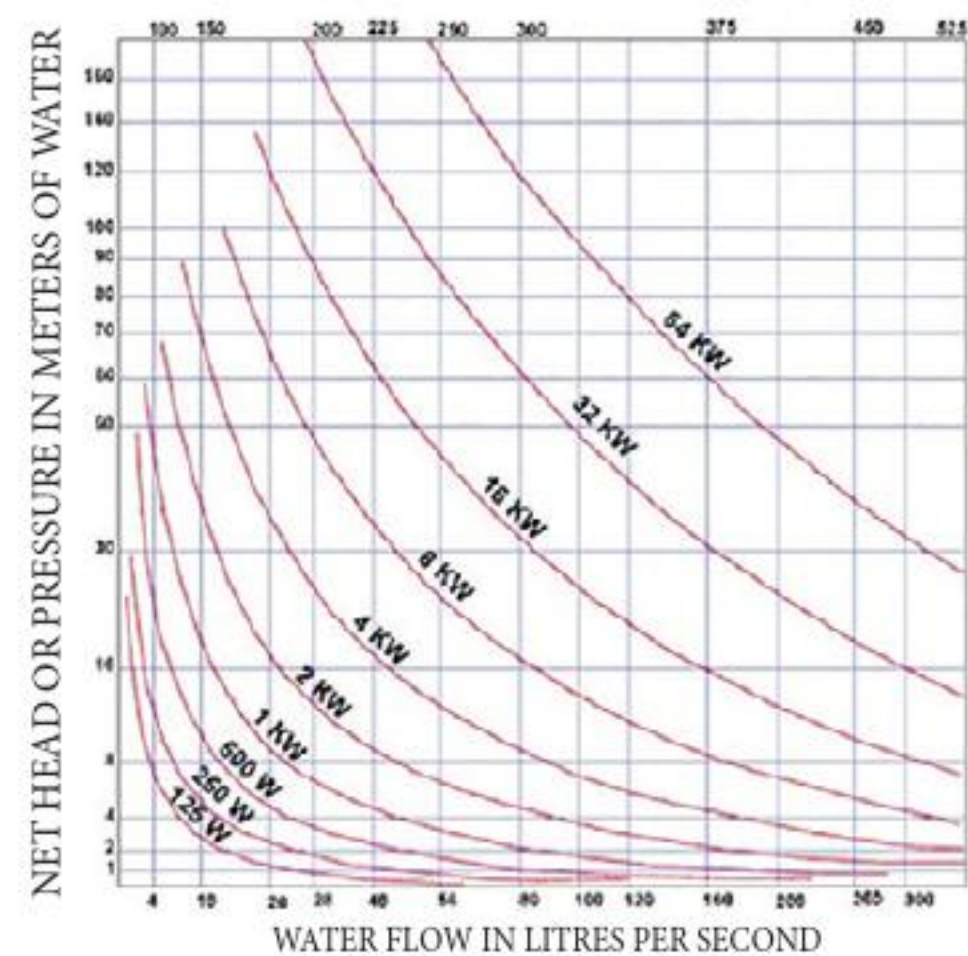
1. NI: As for Solar PV above. Typically wind turbines for domestic installations are around 5 – 10kW so a grid connection application will be necessary. Note that you cannot apply for a wind turbine grid connection until planning permission has been granted.

2. ROI: As for Solar PV above.

Wind turbines can generate considerable energy when correctly sited. Generation is difficult to predict accurately without site specific measured wind speeds. Annual maintenance is required for most wind turbines. Planning permission (in NI) can be relatively difficult to obtain and grid connection for small scale schemes (in NI) is becoming increasingly difficult to obtain at a reasonable cost¹⁴.

MICRO – HYDRO

GUIDE TO ELECTRICAL POWER FROM WATER
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Energy source: Solar energy creates the weather patterns that collect the moisture which falls as rain to feed rivers. Hydro power is therefore also a form of solar power. The power available is a function of the head, (difference in height from abstraction point to discharge point minus any system losses), and the available flow. The flow may be estimated using the rainfall catchment area, long term mean rainfall data and the evapotranspiration¹⁵ rate ►

¹⁴ For more information in ROI see www.seai.ie/Renewables/Wind_Energy. In NI as for ROI but see also http://www.planningni.gov.uk/index/advice/advice_apply/advice_renewable_energy/renewable_wind_turbines.htm

¹⁵ The rate of water loss through evaporation and transpiration to be excluded from the flow data.



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applicable for the soil and geology. The available flow, (both maximum daily abstraction and minimum residual flow), will be dictated by the Environment Agency¹⁶.

1. In NI by an Abstraction License which restricts the amount you can use by limiting the proportion of the flow during which the turbine can be active, in order to protect the environment. That amount depends upon many factors but is typically restricted to the flow in the river between 30% and 80% of the time (see note below for an explanation of how this works)¹⁷. Thus a hydro turbine is likely to be idle for the driest 20% of the year – statistically, 73 days but in a dry year considerably longer.

2. In ROI the planning department will normally require an Environmental Impact Statement or, for smaller schemes with less impact, an Environmental Appraisal will be required. The statement will be required to establish the baseline flow data and propose abstraction rates in line with the published practise¹⁸.

The available flows are critical to calculating project financials. As rainfall, catchment area, head and environmental conditions are site specific it is complex to predict generation accurately.

Operation: Electricity may be generated by a water flow because the flow of water will, by virtue of its weight and its velocity, impart momentum (energy) to a turbine and turn a generator. River water has a significant mass with velocity that can be slowed or caused to change direction, in the process imparting momentum to a turbine or wheel. Similarly, the stored potential energy in a dam, where there is a large volume of water at a height, can be converted to kinetic energy by allowing the water to fall through height and accelerate to give the water velocity and subsequently impart momentum to a turbine or wheel. The generator is usually connected to an inverter. In most cases, the system is the same as for Solar PV after the inverter. All systems will require a form of impoundment to catch and abstract the water and a turbine house and turbine. The head and flow will dictate the type of turbine. In turn, this will usually dictate the system design.

Planning permission

1. NI: Although it is possible to apply for planning permission before securing an abstraction license, an abstraction license will be required before permission is granted and it is standard practice to agree the abstraction license prior to applying for planning permission. All hydro turbines in NI require planning permission. Typically, the

factors that affect the planning decision will include the environmental impact of the entire scheme, access routes, visibility and local planning policy interpretation. The process is complex and can be protracted.

2. ROI: There are no exemptions for hydro schemes. Screening for an EIA should commence at the project planning stage to determine the need for an EIA. Thus early consultation with the planning authority is necessary.

Grid connection

1. NI: As for wind above.

2. ROI: As for wind above.

Hydro turbines can generate a steady, predictable energy output when correctly sized, sited and maintained. Generation is impossible to predict accurately without site specific data for rainfall, evapotranspiration rates and environmental conditions. Regular maintenance is required for all hydro turbines. Project development can be protracted and costly with no guarantee of success¹⁹.

FINANCIALS

The economics of renewable generation for solar PV are relatively simple, working out the cost/benefit of wind and hydro is, as shown above, quite complex. Savings and income are derived from three sources:

1. Savings - by using the clean electricity your system produces on site, you will buy less electricity from the grid and make savings on your utility bills. As grid-supplied electricity prices increase, the savings you make will also increase²⁰.

2. Incentive -

a. NI: under the NIROCs (Northern Ireland Renewable Obligation Certificate) scheme you are paid for every unit of clean electricity you produce from the renewable generator. The number of NIROCs you receive depends on the technology installed and the size of system you have²¹. NIROC values are set annually in October; the price at October 2014 was 4.08 pence per kWh and is expected to reduce annually.

b. ROI: There are currently no incentives on offer²².

3. Income - any clean electricity not used is metered and exported to the grid.

a. NI: In October 2014 each exported unit of renewable electricity from systems <50kW earned 5.10p. Systems >50kW usually sell their generation through a Power Purchase Agreement into the Single Energy Market.

¹⁶ www.energyagency.org.uk/en/hydroelectricity has a useful overview

¹⁷ This varies from site to site. For a good explanation of flow see <http://evidence.environment-agency.gov.uk/FCERM/en/FluvialDesignGuide/Chapter2.aspx?pagenum=6>

¹⁸ "Guidelines on the Construction & Operation of Small-Scale Hydro-Electric Schemes and Fisheries". Central & Regional Fisheries Boards, June 2005

¹⁹ For more information in ROI see http://www.seai.ie/Renewables/Hydro_Energy/ In NI see http://www.british-hydro.org/Useful_Information/A%20Guide%20to%20UK%20mini-hydro%20development%20v3.pdf

²⁰ Bear in mind that prices can go down as well as up!

²¹ DETI are currently consulting on a reduction to the number of NIROCs to be paid in future. A reduction is expected in Spring 2015 of up to 60%.

²² The REFIT 2 scheme is open for large projects.

²³ Unless they were connected under the Micro-generation pilot scheme.

²⁵ These findings and other predictions can be found in the full report "Energy Storage in PV Report - 2014" from the Power and Energy service of HIS.

b. ROI: Generators are paid the current price offered by their electricity supplier for power purchase²³.

The key points for each technology are summarised below.

	Solar PV	Wind	Hydro
Energy Resource Annual Variation %	3-4	20	Site specific
Technology Maturity (Low, Medium, High)	High	Med	High
Technology Complexity (Low, Medium, High)	Low	Med	Med
Installation Complexity (Low, Medium, High)	Low	Med	High
Planning Complexity (Low, Medium, High)	Low	High	High
Carbon Cleanliness (Low, Medium, High)	Med	Low	Med-Low
Project Scalability	Modular	None	None

- **Energy Resource Annual Variation %** - the typical percentage variation in the energy source from year to year.
- **Technology Maturity** - how advanced the technology is; 'high' indicates that limited improvement might be expected in the technology in future.
- **Technology Complexity** - how simple the equipment is; indicates how much risk there is of failure in the equipment.
- **Installation Complexity** - how simple it is to install; indicates how much risk there is in installation.
- **Planning Complexity** - how simple it is to deliver a viable project with all permissions and licenses in place, ready to build.
- **Carbon Cleanliness** - Indicates the amount of carbon emissions in the life-cycle of the project. Low = high emissions
- **Project Scalability** - Whether (and if so, how) the project can be scaled up or down in future.

In summary, solar is one of the simplest renewable energy technologies to design and install, with a long operational lifespan and little planned maintenance. Wind is variable as an energy source, requires more complex project development with less likelihood of success and requires annual maintenance. Hydro is, perhaps, the most difficult of the technologies in terms of project development. However, when successfully set up, it is likely to deliver a reliable and predictable long term generation. Of all the technologies discussed, a Solar PV project is the simplest to develop and may be scaled up if required at a later date.

The four key variables that determine whether it's economical to add energy storage to a residential system are self-consumption, the value of the exported electricity, the expense of buying electricity from the grid, and the cost of energy storage products. According to a recent report, all of these metrics are moving in the right direction; prices of lithium ion batteries are falling (15%



this year alone) and a general appreciation of the benefits of storage are predicted to see this market become a major aspect of the industry by 2016²⁵.

Battery storage for renewables is available in Ireland and will be sized according to the capacity required for the specific project, whether new or retrofit (in the latter case via a battery ac or dc coupled system and the correct inverter), to provide an uninterruptable power supply. As the costs of storage fall, the economics improve. ■

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Apparently our best ideas come to us when we're in the shower, making the process of choosing the right one all the more important! How it looks matters too, so what's new in showers, what are the alternatives and what are the watchpoints when you put in a new one.

Showers come in a huge range of types, sizes and colours, with the latest gadgets allowing you to limit the amount of time your teenagers spend under the water. With customers demanding more in terms of energy efficiency and cost effectiveness, innovation within the sector has never been higher. The introduction

of rainfall type showers has had a big impact on the market as these give superior showering using less water. Digital showering, where the valve can be situated remotely from the bathroom thus taking the bulk out of the showering space, is also proving popular. New on the scene is an App that allows you to pre-heat the shower (or indeed the bath), so it's ready for use when you want it. Both can

be programmed with your desired temperature. Showers have also joined the digital age with temperature control, leaving the dial purely for volume, and they can also show how much water you've used, a helpful feature if you're in a metered area. You can even get lights in the shower head that change colour with the temperature, and one company are marketing a travel head which you can take with you to fit into the hotel one!¹

Currently one of the most popular is the drench head shower concealed in the ceiling, with a separate handset and fed by a combi or pressurised system in place of gravity-fed. This means that the pump does the whole house as well as the shower. A fixed head is also popular and provides a number of spray modes including massage, champagne and rainfall. This last is an effective, low water consumption style as the droplets stick and soak and don't bounce off. It also helps to keep the shower enclosure cleaner because of less water spray, to the extent that one customer accused her son of not showering because the glass looked too clean!

Over the last five to ten years low level shower trays have become the norm with some trays enabling level access as they're designed to be fitted direct to the floor joist and tiled up to the edge of the tray. The glass for shower enclosures has also changed, becoming thicker and presenting a luxury look and feel. These trends are not only a drive for minimalism, but also for inclusivity; eliminating steps up into the showering area and simple operating mechanisms such as ergonomic handles make showering a simpler process.

There are four main shower types: electric showers, mixer valves, power showers and pumped showers.

Electric showers

We all love the convenience of the instantaneous hot douche from an electric shower and that's why it's probably the most popular one if your priority is instant hot water. There are two options: mains fed, or gravity fed from the cold water storage tank in the roof space. The pump in a gravity fed shower, (which generates the water pressure), makes this shower slightly more expensive than a mains fed. Despite the cost, it's still an ideal shower for areas where mains water pressure is low, additionally, if another person uses a water tap elsewhere in the house the supply to the shower remains constant. With the advent of mains gas in many urban and suburban areas, there is a strong move away from electric showers to ones working off a combi boiler; mains gas or oil are considerably cheaper than electricity to heat water.

Mixer valves

Mixer valves are either thermostatic or manual. Their role is to blend cold water with hot that has been heated from another source such as an oil or gas boiler or electric immersion. Using an independent supply of both hot and cold water, the water is blended in the valve to the desired temperature and exits through either a fixed or adjustable shower head. A thermostatic shower automatically adjusts in the event of another water source being turned on in the vicinity. A

consideration is that these units tend to be more expensive due to the extra parts needed.

Power showers

These are available in both manual and thermostatic options, but not electric; the components are housed in a box on the wall. They also mix hot and cold water like the mixer valve but with the addition of a built-in pump to increase the pressure of water going through the unit. As a rough rule of thumb this type of shower can supply 15 to 18 litres of water per minute, compared to an electric shower which gives approximately five litres of hot water per minute.



Wet rooms

A 'true' wet room has no enclosure round the shower and you have probably used one if you have been in a hot country. Think carefully though if you're planning to re-create the experience back home in Ireland because they rely upon a much drier climate to ensure the effective removal of the moisture. It's also difficult to keep anything else in the same room from getting wet. In the UK and Ireland, a wet room is more accurately ►

*Exposed raindance
shower head
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one with a partial screen, a look more people are choosing. Aside from their aesthetic benefits, some of the more practical advantages include easier to clean surfaces and reduced risk of water spillages. You will though still have to allow for the damp atmosphere, making storage of anything in the same space problematical. Wood and chrome plated fittings are especially vulnerable. Bathroom storage in general is a major issue as in the enthusiasm for more bathrooms, we forget about allowing for the things we need in them.

Pumped showers

This describes a shower where the pump is at some distance from the actual water delivering shower

head. It could be located in the roof space or an outhouse, but generally they are sited in the hot press beside the cylinder. If it is a shower with body jets or a rain/drench type shower head, remember to tell your plumber as a larger pump may be required to give the pressure needed. The capacity of the hot water cylinder should also be sized correctly to allow for the volume of hot water being used.

In areas where there is no mains gas and low water pressure, a pumped electric shower with cold supply only is a good option as they're simple to install.

Choice

Electric showers are 98 per cent efficient in terms of hot water usage because they only heat the water that's needed, but advocates of mixer showers argue that the cost of heating that water is high. The best answer is to choose one that gives you the best showering experience with the lowest flow rate for what you want to do. This last may seem an odd thing to say, but showers mean different things to different people; some will just need to get shampoo out of their hair or maybe it's to relax after a gym session. Dog washing is a big use! Something you may not have thought of is that your skin becomes more sensitive as you age so older people might prefer a softer spray, while younger ones like a more forceful, cleansing spray. The solution is a head with a variety of spray types. Eco heads are another new development, designed to give the same coverage and showering experience, but with approximately 15 per cent less water. It's a simple DIY job to change to one and they're the same price as normal heads. Remember to choose with your head, not your eyes - waterfall showers look fantastic but they're not nearly as effective. One supplier likened them to a (warm) ice bucket challenge!

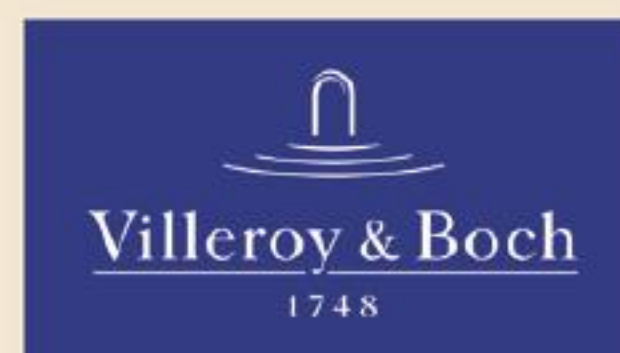
Shower enclosures

If you're thinking about investing in a new shower enclosure you need some essential facts before heading for the showroom.

The size of cubicle is crucial; too large and it may cramp the rest of your bathroom, too small and it may be a tight fit for you! Height is also an important consideration; enough room should be left between the top of the cubicle and the ceiling for steam to escape. Location matters too and if it is a replacement, try to keep it in the same area; moving pipes is expensive and often troublesome. Apart from keeping your bathroom floor and walls dry, seals should be robust and effective to prolong the life of your shower. Magnetic strips are excellent for keeping water in but the type of strip that's best for you depends on the design of your shower door.

A leaky shower door is typically caused by a bad door seal. Normal ageing and wear causes the strip at the bottom of the door to break, crack or just seal poorly. Replacement seals provide an inexpensive solution to the problem. Although these seals look like plastic, they are more typically made of rubber or vinyl because these materials have a longer life. ►

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How to replace a shower seal

- 1** **Inspect** the bottom of the shower door to determine the plastic seal attachment method. Seals typically slide into a channel at the bottom of the door or they are placed between the base of the door and the metal drip rail.
- 2** **Remove** the metal drip rail if necessary for plastic seal access. The rail is attached to the door with small screws. For channel-style seals, pull the old plastic strip out of the rail channel. Use needle-nose pliers to grasp the strip and pull it out, if necessary.
- 3** **Wipe** the door channel and bottom rail with a damp cleaning rag to remove dirt and soap residue. Use an ammonia-based cleaner to cut through heavy grime build-up. Wipe dry with a clean rag.
- 4** **Remove** the adhesive backing from the new seal, if applicable. Not all seals have adhesive.
- 5** **Slide** the seal into the channel, using the pliers to pull it into place if necessary. For those placed behind the drip rail, stick the adhesive portion of the strip to the bottom edge of the door with the plastic seal portion hanging beneath the door frame.
- 6** **Cut** the excess seal length flush with the edge of the door, using a utility knife. Place a small bead of silicon caulk at the end of the strip to prevent moisture from getting into the channel. Replace the drip rail.

Shower doors

Shower curtains, whilst cheap and cheerful, tend to develop mould and it's difficult to stop water running down them and out onto the floor. Shower doors are much more elegant and effective at providing a water-tight seal, privacy and easy access to your shower. They are available in many configurations, designs and sizes to match any budget, from the purely functional to a style statement. Your choice should be based upon the design you prefer, the size of the opening (height and width), and practical considerations determining how your door should open.

There are three main categories of shower doors :

- Bathtub showers

which use a bath shower mixer tap

- Alcove standalone showers

which are fitted as a separate shower cabinet

- Corner standalone showers

which are also freestanding cabinets but are fitted into corners

If the enclosure area is new, do not take any measurements until it has been completed as wall finishes such as tiles can reduce the wall-to-wall width by as much as 1"/25mm on each side.

How to measure

Note: measurements should be to the nearest 1/16"/4mm

- **Opening width:** Determine the distance from wall to wall at the top and bottom of the opening. If these differ, select a door using the larger width for a bypass door or the smaller width when selecting a pivot door.
- **Opening height:** Determine the distance from the top of the tub edge or shower base to the top of the wall unit or tile wall where you want the door to be located. Measure vertically at both sides.
- Select a door with a height less than or equal to the smallest of these measurements.
- If space is an issue, either a bi-fold or a sliding door are both efficient ways to use space without restricting access in and around the bathroom. If you're got plenty of room to play with then a frameless surround which creates an illusion of space is still a great option, enhancing the spatial benefits already present.
- Rollers on shower doors are often the first thing to break so ensure they look strong. When considering the shower handle, the choice lies between plastic, chrome coated or solid metal. Initially plastic or chrome coated handles are more affordable but this may be a false economy as they're not as strong and may not last as long.

Maintenance

As mentioned earlier, the trend is to have a shower with a fixed glass screen and an opening so you don't have runners to keep clean. For a wall covering, there are traditional tiles in large or small sizes and wall panels. The latter require less labour than tiling and are very simple to clean, but the use of large format matt tiles with a coloured epoxy grout to match is another option. A watchpoint when grouting these is that removing excess grout from the tiles is time consuming so care is needed. If you live in a hard water area, and most of Ireland is, the build-up of limescale may affect the performance of your shower. Bear this in mind when purchasing, there is also a shower head available that has a pin system so is automatically cleaned as it's used.² Opinion differs on using a few drops of vinegar to remove limescale; whilst it can be effective in the short term, it is easy to do damage to chrome and plastic.

² www.mirashowers.co.uk

With a new installation, putting in isolation valves to remove or clean pieces is a good idea. This also makes showers more consumer friendly.

Cost

How much should you expect to pay for a shower? Prices range from €100/£80 to thousands, with the average price sitting between €400/£300 and €800/£600. Mixer showers using high pressure valves are one of the most economic options but they do require a steady, good level of water pressure, something that is not available in all areas so check before you buy.

Given the huge range of choice, make sure to allow plenty of time to view as many styles and types as you can, listen to what each supplier has to offer and remember to compare like with like. ■

Gillian Corry and Catherine Doran

Additional information

Wayne Lyons of Soaks Bathrooms, Belfast www.soaksbathrooms.com tel. 028 9068 1121
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Lock right lock tight

According to the Central Statistics Office, in the past year over 26,000 burglaries took place in Ireland. The first six months of 2014 alone saw almost 18,000 break ins and it's during the winter months when days are shorter and darker that most of them happen. How can you keep your home safe from attack? Are your locks fit for the job intended and how are intruders breaking into our homes so easily?

The dark evenings make it easier for intruders to identify unoccupied homes and the Christmas and New Year period are, naturally, an added incentive for a forced entry. Burglars tend to go for what they view as easy targets - houses with no lights on, no alarm, or unsecured doors and windows. As a basic guide you should make sure all doors and windows are secure, even when you're at home as there are many instances of goods being stolen even though the house was occupied at the time. Interestingly, burglars are most likely to break into a house through a rear window (28% of cases), followed by a front door (27%) and rear door (25%). Finally, don't rush out without setting the alarm, a few seconds is all it takes.

Prevention better than cure

It sounds obvious to say so, but simple things like locking everything, including upstairs windows, at night, is a good first step to securing your home. Leaving a spare key, 'somewhere handy just in case', even if you think you've been clever about the location, won't be smart enough to beat an experienced burglar, according to An Garda Síochána.

Security specialists recommend fitting timers to light switches and even to televisions or radios to make it appear the house is occupied and are an especially good idea if you plan on being away from home for a few days. Some modern timers can even connect to the internet using your home's WiFi and be operated remotely from your smartphone, giving you an extra degree of peace of mind and control.

In rural areas, sensor lights and a monitored alarm shouldn't be an option but a necessity. For people living alone, the Gardai recommend investing in a door chain and spy hole to see who it is without opening the door, and never allowing a stranger into your home. Asking trustworthy neighbours to keep an eye on your house when you're away is also a good idea.



Home invasion

Intruders are employing innovative and unfortunately, more effective ways of gaining access to our homes. A recent development has been 'fishing' burglaries whereby the intruder uses long rods to steal car and home keys through the letterbox. Figures from the Garda show that around four burglaries every week now involve the use of adapted fishing rods or long bamboo canes to snag keys left on hallway tables. Hooks or powerful magnets are attached to the end of the rods to catch the unsecured keys, often left within a few feet of the front door. Gangs are then able to steal cars without triggering alarms or break into homes without smashing windows or doors.

Traditionally, an opportunist burglar spends three minutes trying to gain entry, and, if unsuccessful, moves on quickly. A new phenomenon, one that is not deterred by alarms and cameras, is the burglar who monitors his victims carefully, noting regular times of arrival and departure during the day and when rooms are used. They are equipped with all the tools needed to break and enter an average home and often steal to order. ►

Easy targets for burglars
Marcus Patton





Sensor lights and a monitored alarm shouldn't be an option but a necessity.
Marcus Patton

Lock bumping and lock snapping

Lock bumping is a lock picking technique for opening pin tumbler locks using a specially-crafted bump key. Whilst locksmiths have always been aware of how it is possible to open a lock by dealing it a blow and turning it at the same time, recently burglars have developed their own DIY technique of cutting a special bumping key, which is inserted into the lock and struck with a blunt object whilst being turned.

Unlike other methods such as picking, lock snapping does not require experience, precision or skill, relying instead on sheer brute force. Using tools such as hammers or screwdrivers to snap the locks, it can take criminals just seconds to gain access. The locks most at risk of lock snapping are those with a Euro profile cylinder, popular in uPVC and composite doors installed in the last 15 years and operated in combination with a multipoint lock.

The security industry has developed products to counteract lock snapping burglars and advise homeowners to upgrade their cylinder to one that is specifically designed to prevent attacks and meets the TS007 standard. This is a security standard introduced in response to the growing threat of burglary as criminals' methods of breaking in to homes become more sophisticated, and is the most robust of all. The standard uses a three star system in which the cylinder, or a combination of the cylinder and security furniture, must have an accumulative three stars to meet the minimum-security requirements.

Safe and secure

Without dismantling it, you can't tell from the outside if your lock is at risk. Although this is fairly simple to do, you're generally advised to contact the manufacturer for advice.

A sash lock joins a latch and bolt and has a handle either side of a door; they are mainly fitted to back or side doors. A sash lock should always have five levers when installed on an external door and carry the British Kitemark for the best level of security. Two or three lever locks should only be used on internal doors or those where a low level of security is required.

A night latch, which operates with a cylinder is placed on the outer rim of the door frame and when the door closes, the lock engages with the deadlock and requires a key to open. At night, if the snib is pushed up the deadlock cannot be opened by the key. The snib can also be used to lock the night latch in the open position. A good standard of lock will carry the BS 3621 rating. As a safety precaution, in the event of fire a spare key should be kept nearby.

External timber doors should be secured using a mortice lock and/or night latch that meets British Standard BS3621:2007 and if you have a uPVC or composite door then it is a good idea to upgrade the euro profile cylinder in your multi-point lock to the British Standard TS007 three star system as well, (look for the Kitemark on lock packs and on the lock itself).

It is important to note that locks that only have a BS TS007 1 star rating would need additional 2 star rated security handles or guards. Upgrading ►

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A snapped Euro-cylinder lock
ABS, www.abs-secure.co.uk

your cylinder locks to a snap-secure product is a simple four step job that should take no longer than five minutes and can save you around £30/€38 per lock. Note that it may be necessary to loosen the handle screws to take tension off the cylinder while removing or inserting the new lock.

- 1 Open the door and locate the fixing screw and unscrew it
- 2 Remove the fixing screw, insert the key and turn slightly, withdraw the cylinder by pulling on the key
- 3 Prior to fitting the new lock, insert the key and turn slightly to align the cylinder so that it can slide easily into place. Also ensure the side marked EXT is on the outside of the door.
- 4 Once in place, replace the fixing screw to secure. Finally make sure the new cylinder is operating correctly by locking and unlocking your door

This process is suitable for the majority of doors, the exception are French doors which require a professional. If you have an old uPVC door it is also recommended that a professional locksmith should perform the upgrade to advise on the quality of the door and the condition of existing security of the multi-point door bolt.

Windows and glazed doors

By tripping the catch from the outside with a knife blade or by removing enough glass to reach and release the catch, windows can provide a very simple point of access to a burglar. They are the most frequent point of entry during warm weather months and are left unlocked at a much higher rate than doors. An open window visible from the street may be the sole reason a house is targeted, and one with only a locked window screen is particularly

inviting to thieves; access is quick, easy and silent.

All accessible windows should be fitted with key-operated window locks in addition to the latch. Wooden sticks or dowels work well with horizontal sliding windows whilst through the frame pins are appropriate for vertical windows. For ventilation, leave no more than a 4 – 6"/100 - 150mm window opening and make sure that it's not large enough to allow someone to reach through to unlock the door or window.

Ground floor windows are the most commonly used points of entry but windows on upper floors accessible from flat roofs or drainpipes shouldn't be neglected. It's not particularly expensive to have window locks fitted and there is a wide range for every type of window to choose from including wood and those with metal, aluminium or uPVC frames. Basement windows are also an easy target since they're low and usually well hidden. To prevent access, a steel bar can be wedged across the window or alternatively, a lockable metal grate can be installed.

One of the most vulnerable entry points of any home are sliding-glass doors. Burglars like them as they're the easiest way to remove bulky or heavy items. Apart from smashing the glass, standard factory locks can often be opened with relative ease and even locked doors can be lifted off their tracks for a quieter break-in - one that can be done without tools. A flat-head screwdriver makes the job even easier. Two relatively simple methods of preventing or slowing entry are a wooden dowel jammed into the track to prevent the door from opening or a sliding bolt can be secured to the frame to prevent the door from moving even if it is lifted off its track.

The demand for better security of windows and doors has led to the industry responding with what are claimed to be the first, guaranteed, burglar proof windows and doors.¹

¹ From Fairco Windows and Doors www.fairco.ie

Locks – what should you use?

External Doors - All external entry doors should be fitted with good quality locks. Five lever locks provide the best protection against any type of forced entry.

On **wooden doors**, a mortice deadlock provides the best protection against all forms of forced entry including picking, drilling and hacksaw; it consists of a single bolt lock which is inserted into a hole, the mortice, which has been cut into the edge of the door. These locks are all the same size, meaning that an old two-lever mortice dead lock can be replaced by a new five lever model of the same size (with very little additional prep work). A five lever lock will cost more but provides better security than a two or three lever lock.

Door Viewers/Security Chains - A restraining chain - tested to TS003 - is a simple and low cost method to stop the "foot-in-the-door" or shoulder barge attack, whilst a door viewer allows you to identify your visitor before opening the door.

Checklist

- Lock all windows and doors, even if only leaving the house for a few minutes.
- Never leave keys in sight of or within easy reach of windows and doors and try to avoid obvious places such as a board on the wall.
- Do not leave spare keys in a garden shed or garage.
- Fit key operated locks to all windows
- Fit - and use! a visible burglar alarm
- Leave lights and the radio on a timer for the evening if you go out and draw curtains if dark.
- Secure your garden with a good fence, padlocked gate and locked garden shed.
- Don't leave tools or a ladder a burglar might make use of outside.
- Valuable, easily lifted items like laptops, handbags and jewellery should not be visible from the window.
- Do not leave cash, documents with your name, address or other personal details (such as a bank statement or bill) that fraudsters could use lying.
- If going on holiday, arrange for a friend or neighbour to collect the post and put the bins out.

How to protect your home from burglars

- 1** Use a maximum security British Standard lock on your front and back doors and use more than one lock on them; a deadlock on the front door (to prevent burglars using it as an exit), and mortice security bolts on the back door.
- 2** Do not give a burglar the tools to break in (see above). Make sure sheds and garages are locked, burglars can also use wheelie bins and garden furniture for climbing, so secure these also.
- 3** Secure your windows as described earlier, especially any above a flat roof. Visible locks are a useful deterrent. Use curtains and blinds to make your front window and back windows difficult to see into. Don't leave a calendar showing appointments easily visible through the window!
- 4** Don't give a burglar hiding places in your garden. Use motion-detection security lights and trellis on top of your walls.
- 5** Do your best to make your home look occupied when you're out.

Locks are only as good as the door and the frame they are attached to, so keep them in good condition and buy the best you can afford. ■

Catherine Doran

Additional information

Avocet www.avocet-hardware.co.uk

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Do your best to make your home look occupied when you're out.
Marcus Patton

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Making a vanity unit or medicine cabinet

If your home is like ours, every flat surface in your bathroom will be covered with bottles, make-up, gels, razors and blades, nail clippers and all the other accessories that go with getting us ready to meet the outside world.

It's also important to have somewhere to lock medicines and toiletries, safe from the reach of resident or visiting children. The answer to a tidy and safe bathroom is a cabinet that holds all of these and adds to the overall look of the bathroom.

In this project I am going to be using the most

identifiable woodwork joining technique around. This is the dovetail joint. **Photo 1.** The dovetail joint is in my opinion, the number one joint. It is extremely strong, it looks beautiful and really shows off the skills of the maker. When done properly it can become part of the aesthetics of the project rather than just for functional strength. ►



Photo 1

Time to get started. How do you make this iconic joint? The first thing to do is to mark out the tails of the joint. The tails are the sides that are in the shape of a dove or pigeons tail. **Photo 2.**

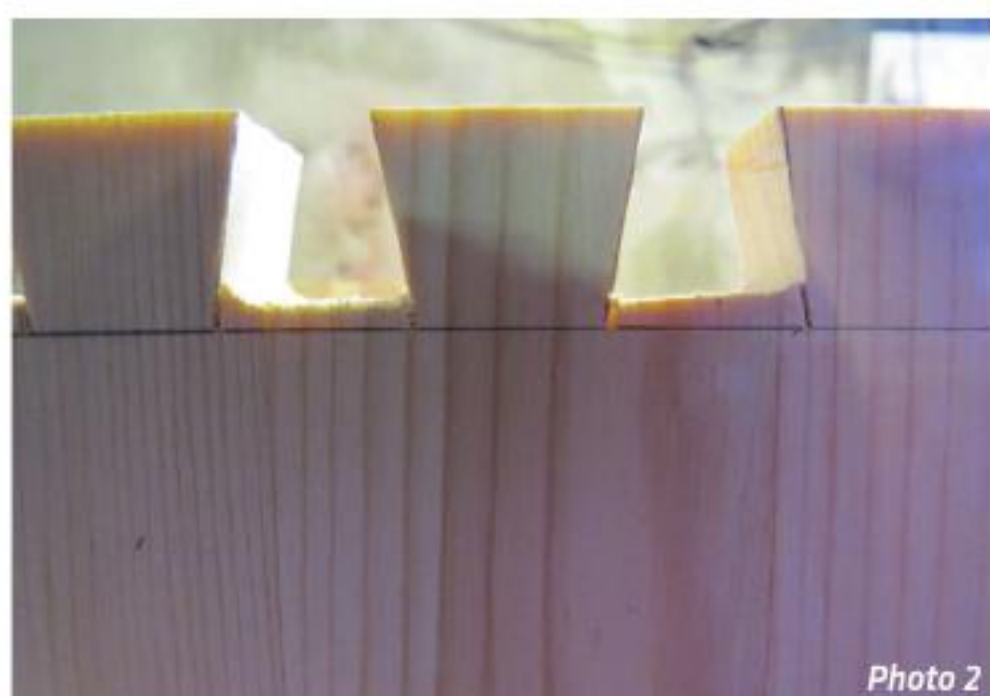


Photo 2

Measure the thickness of timber and transfer this measurement to the ends of each piece. **Photo 3.**



Photo 3

Use your steel rule and measure the dimensions given for the layout of the dovetails along the pencil line. Dovetails are marked at an angle to provide strength when a force is applied. They act as a wedge and actually get tighter the more force that is applied, which is why they are used in drawers. As you pull the drawer out the joints can actually get tighter. To mark this angle, a dovetail template is used. **Photo 4.**



Photo 4

These come in a range of different designs and sizes and can be easily made from waste material. They are used to give this angle. Hold the template against the markings along the pencil line and draw these angled lines carefully up to the top edge of the piece. Square them across the end grain to finish off the markings. It is not necessary to mark the opposite side of the timber. Mark the waste with x's or any other technique so you don't cut the wrong part off. Use a scalpel or any suitable blade to sever the wood fibres at the base of the waste material to leave a nice clean edge when chiselling. **Photo 5.**



Photo 5

To cut out the waste between the tails, put the piece in a vice or workmate bench at an angle so that the line you are cutting is vertical. It is easier to put the piece at an angle and saw vertically than to saw an angle on a vertical piece. Saw on the waste side of the line down to the pencil or base line. Repeat this process for all the sides of the tails. To remove the waste in between the tails, use a coping saw or piercing saw, that is, one with a fine blade. **Photo 6.**



Photo 6

Cut to just above the pencil line and remove the rest with a sharp chisel. Work from both sides of the piece to prevent breakout of the fibres on the other side. Finish the chiselling by placing the chisel in the scalpel cut. Use a mallet if necessary to strike the chisel. Only take small pieces at a time, don't get greedy and try to remove too much. It will only end in disaster! Clean up the joint and make sure there is no extra material in the corners as this will affect the finished joint. **Photo 7.**



With the tails completed it's time to work on the corresponding piece called the pins. Put the pins board into the vice, place the tails board that you just cut on top of the pins board and use the scalpel or a very sharp pencil to mark around the tails onto the end of the pins board. **Photo 8.**

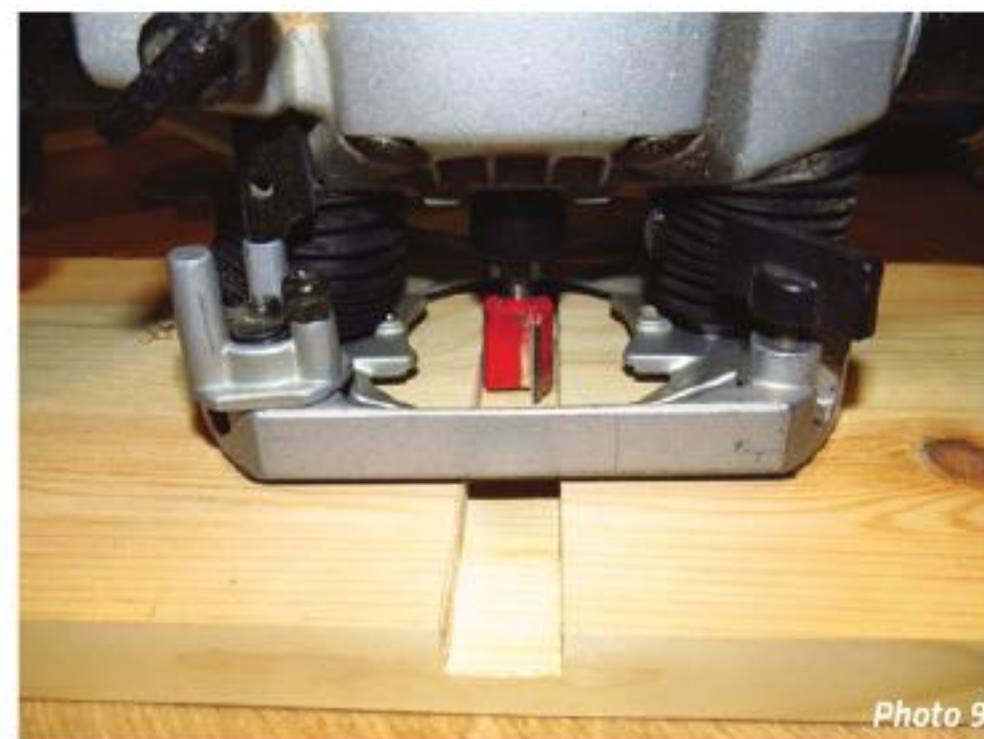


When you have these marks on the end of the board, square them down onto the face of the pins board. Again, only one side is necessary. Use the scalpel again to scribe the bottom of the waste to sever the fibres and leave a nice crisp line when you finish chiselling and sawing.

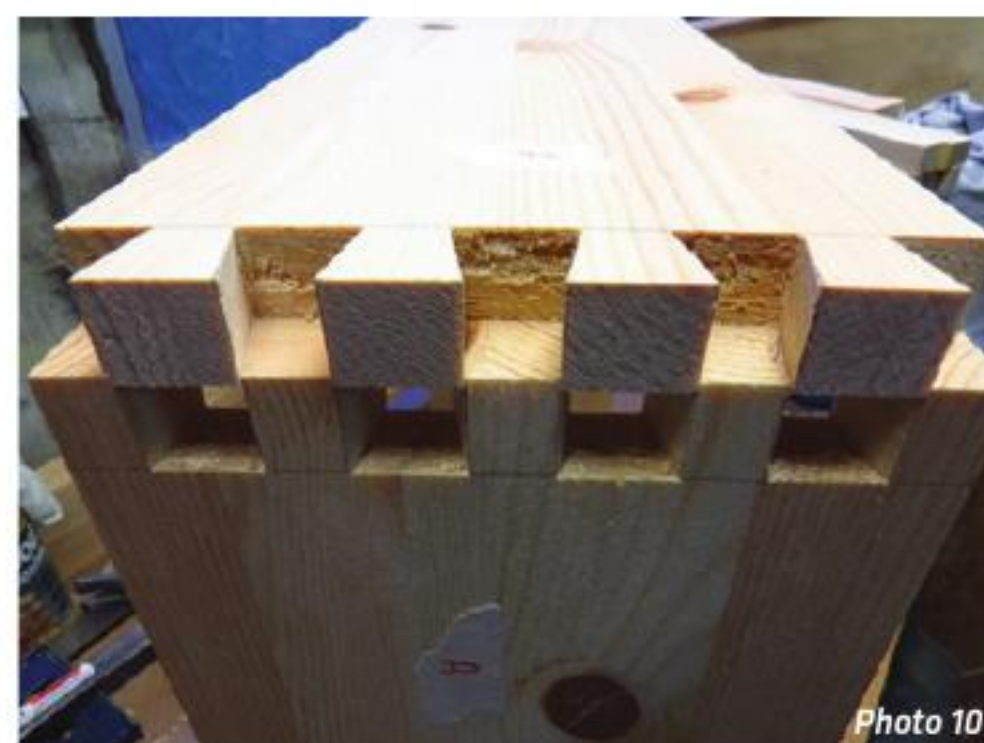
Saw down to the pencil line and using the same technique as before, then use the coping saw to remove the waste in between the pins. Cut close to the line but not exactly to it and use your chisel to trim down as before. Again, make sure to clean out the corners and that the bottom of the joint is flat with no bumps or raised parts. Before we assemble the piece, grooves must be machined into the sides of the timber to accommodate a shelf.

In this example I will insert a shelf half way up. There are a number of ways to do this such as using screws, dowels, joints such as mortise and tenons but I am going to use a housing joint. This is a straight groove that the shelf will fit into. I am going to cut it out with the use of a router. A router is a power tool which spins a router bit at a high speed to cut designs and grooves into the timber. I am going to use a straight router cutter set to half the depth of the timber and use this to machine out the groove. Hold the router against a batten or fence to guide the tool in the direction you want.

Photo 9.



When the joints are complete it is now time to test fit each corner. Lightly tap the joints together and examine them for any interference. **Photo 10.**



You can use a timber mallet or a steel hammer and a piece of scrap timber to protect the surfaces. If you feel the joint is not going together without over exertion, look closely to find where the joint is rubbing and pare this piece off. Don't force the joint or it could end in disaster and split the piece down its length. A good tip is to shade the sides of the joint with a pencil and look for any smudges. Now do a test fit and if it is all linking in accurately, take apart again. Pour some glue into a small ▶



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container and apply a thin layer onto the sides of the joints using either a thin piece of card or an old brush to brush it on. **Photo 11.**



Photo 11

Tap the pieces together again and make sure all the gaps in the joints are closed up. Use a clamp if necessary to pull the pieces together. Check to see if the box is square by measuring the diagonals and making sure they are the same length. **Photo 12.**



Photo 12

Slide the shelf into place at this stage as well, using glue to keep it in place.

When the glue dries, use a plane to clean up drips and smooth down any discrepancies in the joints. Hold the piece in a vice at this stage or clamp it to a table or bench. To attach the back, it is necessary to rout a rebate into which the back panel will sit. A rebate is a groove cut into the back of the piece so that it fits into the unit and is not visible from the side. A rebate bit is used with the router to form this. Cut the back piece to length and width and glue and pin into the unit using panel pins. **Photo 13.**



Photo 13

The next step is to construct the door frame. I am going to use four lengths which are cut at 45deg to form a mitre joint. **Photo 14.**



Photo 14

This joint will be reinforced with loose tenons to strengthen it. A rebate will be formed, using a router on a router table, on these pieces to accept a mirror. **Photo 15.**



Photo 15

To cut the mitres, you can use either a mitre box and handsaw or a chopsaw or mitre saw. Hold the piece against the front of the unit and mark the length of the piece. **Photo 16.**



Square this line with your try square and pencil along the edge. Set the saw to 45deg and cut to this mark. **Photo 17.** Repeat the process for the other three pieces.



You can cut the loose tenon in a number of ways, I am going to use a domino joint. A domino joint is an elongated dowel, it resists twisting and is extremely strong. **Photo 18.**



A biscuit joint can also be used. **Photo 19.** Mark the two mitres with a pencil line. Hold the machine against the end of the mitre, line up the pencil line with the centre of the machine and plunge the tool into the piece. The machine will cut the recess out. **Photo 20.** Insert the domino or biscuit into the recess and glue the pieces together. Clamp together until dry and plane clean. **Photo 21.**

The last step is to hinge the door onto the frame with hinges to suit your design. These include fancy butterfly hinges, cabinet hinges and piano hinges that require no recessing, or the standard



butt hinges I used. A recess must be cut out of the unit and the door frame to house the butt hinges. To recess out the hinges, draw around the hinge and chop out this recess with your chisel. Take your time, make sure the chisel is sharp and work to the pencil lines. Keep test fitting the hinge to make sure the fit is right.

Complete the unit by applying any finish you desire. This can be oil, stain, varnish, wax or paint. I applied a stain to help it blend in with existing furniture in my bathroom. I brushed the stain onto the timber and wiped off the excess with a cloth. When dry, I put on a couple of coats of varnish to give a nice shine, allow for easier cleaning and protect it from any steam or vapour in a bathroom situation. Fit the mirror or timber panel into the frame of the door using a silicon adhesive. Fit a handle, lock or any other fixtures you need to complete your project.

There you have it. A professional looking, handmade unit that will take pride of place in anybody's home. Use these new skills to build yourself units of different sizes, jewellery boxes, bedside lockers etc. Take your time, keep your tools sharp and above all enjoy this project. You will be bursting with pride on completion of such a useful piece, power to your elbow! ■

Ciaran Hegarty
All images courtesy of Ciaran Hegarty

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The purpose of a seed is to germinate and start a new plant- it is primed and programmed for that, all you have to do is set it on the right path.

Starting from seed

Growing plants from seed is one of the most rewarding gardening tasks you can undertake. It is just a joy to take a tiny grain and gain a whole new plant from it.



N

ot only is it the miracle of life happening before your eyes, it's also the most economical way to increase existing stock and add new plant varieties to your garden... especially

unusual or heritage varieties not found in pots in your local garden centre. What is so wonderful beyond the engagement with cultivation and the benefit to your pocket, is that it is not that difficult a skill set to master – in fact it's downright simple because it's something the seed wants to do anyway.

The purpose of a seed is to germinate and start a new plant- it is primed and programmed for that, all you have to do is set it on the right path. Put it into contact with soil and some moisture (occasionally there is a temperature range to adhere to), and fire the starting pistol. Within days a dot of green will appear in your seed tray or upcycled yoghurt carton and after a few more days, that dot becomes an unfurling leaf, then two leaves, then three and before you know it, a whole plant is thriving.

It's that simple for the vast majority of seeds, whether you've saved them from your own garden plants gone to seed or purchased from your local garden centre or online. However some seed, no matter where you have sourced it, needs a bit more attention than dropping onto soil with a splash of water. That could be bit of cloche action to get the right temperature exposure or extra care in how deep you sow it, information you will find on the seed packet or a quick internet search of its botanical name if you have it. If a gardening friend gave you some seed or you got seed at a giv seed swap then the donator will know not only the name but will have all the salient facts – usually imparted even before you ask! If you have 'wild crafted' the seed' (that's the civilized term for 'nicked it' out of a neighbour's garden, from a nearby wild meadow or public park), and you don't know its name or growing nature, then you may want to investigate a little to learn if it naturally germinates on the soil surface or is it best covered by soil. Does it like to germinate fresh from the mother plant, or dry out first or even hang about to be weathered a bit before germination? Try some of the great reference books in your local library with pictures coded by petal colour or flower shape, or ones that go by environment – did you get it from under a shady tree or in a sunny garden? It doesn't matter if the flowers are wild or cultivated, there are many

great visual online resources for both.

I am often asked if there is a difference between packet seeds and saved/fresh gathered seeds or can you grow seed from the wild in your garden? The answer is simple - once we replicate their natural preferences we can germinate any plant at home. Seed packets will tell you how to do that for what you have purchased, but for something 'wild crafted', or even gifted from a friendly neighbour, it's a good idea to look up its lifecycle. If it grows in shade under trees, then it's used to germinating in leaf litter, if it grows upon alpine slopes then some vermiculite or sharp grit may help it along quicker. Time of year is important too, just as much as the right soil type, not everything wants to germinate in spring, but we can trick most in to doing just that.

To help with that lets look at how seeds germinate. Part of a seed's make-up is a system of safeguards to hold it intact until the optimum moment arrives for new growth to succeed and thrive. In some seeds it's a period of cold that triggers germination – the seed may have a waxy coat or powdery gloom that needs a cold winter to crack it or wear it down so it can germinate come spring – the waxy coat etc. holds it safe over winter until the warmer weather arrives. By exposing that seed to our fridge freezer for an hour or two each day for a week or so we can degrade the waxy protection, make it believe it underwent winter and so have it ready to germinate right now instead of in a year. In other seeds a period of a specific warmer temperature is called for which you can provide with a heated propagator, or a window sill with a sheet of reflective tin foil and a homemade cloche recycled from a beverage bottle to ramp up the solar intensity of the sun and keep the ►

Left: Planting seeds is the most economical way to grow plants.





Some seeds, no matter where you have sourced it, needs a bit more attention than dropping onto soil with a splash of water.

heat focused on our growing media and emerging seedlings.

At the extreme end are some seeds that need smoke to germinate! No hocus pocus, it's just that they are programmed to germinate after forest fires. E-cigarettes don't work on this one, it's a case of a bit of straw in an old biscuit tin and seed in a sieve or tea strainer that's allowed to catch the aromatic waft of the smoke emerging. Thankfully however, for most seed it starts with nothing more than simple exposure to moisture – some will even germinate on a damp tissue. So if this is your first time out, I recommend sowing yourself a handful

“Thankfully however, for most seeds, it starts with nothing more than simple exposure to moisture...”

of cress on a damp tissue in a saucer, within a few days you will have germinated them with ease, not only a confidence boosting experiment but a sandwich filler to harvest. I told you it was rewarding! Starting from seed really is easy, – even with the tricky ones it's just a simple procedure to follow - add water or hold over smoke – not a million miles away from bring to a boil or let simmer for ten minutes; if you can poach an egg you can rustle up a garden in no time too. Very often as gardeners we are simply endeavouring to deceive the seed into thinking its time has arrived by supplying that moisture, temperature or triggering factor, just to steal a march of a few weeks extra growth or to extend harvest by starting early. There are times when we need to make the seed believe that it is in its native region as with some tropical or houseplants so that it hatches in the first instance. Other times there is no tricking at all, it is its time, conditions are perfect and all we are doing is placing the seeds where we want these new plants to be. The essence of any trick is that once we provide the right environment the seed will do its job. All we need to discover is what that right environment is.

You will need to determine if the seeds you have should be started indoors, bearing in mind a windowsill is as good as a greenhouse for a small quantity of seed; or are your seeds the type best direct sown outside? 'Direct sown' is a technical term, you may also see 'in situ' on some seed packets, it just means put the seed in direct contact with the soil exactly where you want the new plant to arise from – in the border in the garden or direct into the container on the balcony or wall. In those direct circumstances, especially direct into the garden, it is vital to leave markers or labels to distinguish where and what you have sown. It is a good idea starting out, before you learn the difference between a germinating weed and a germinating ornamental or edible seed you've sown, to sow in a pattern; a straight line, an X or even a smiley face, anything to differentiate your wanted germinations from what needs to be weeded out. You will then easily and effectively take out what does come up outside the x or whatever pattern you or your children have chosen. Sellotaping the seed packet to a stick is not as weather proof as a pencil written (or permanent marker) name on an ice pop stick or a pack of labels from your local garden centre. Apart from the name, I write the date; if the packet says germinates in two weeks and your label is two months ago – then there is a problem. I never sow the whole packet in case this occurs and then at least you get to have a second go, often a direct seed failure is nothing you did wrong, you may have dug too deep or not deep enough, but it could easily have been puddling rainfall lifting and transporting seed away or even hungry birds.

Received wisdom is to weed the place where you will directly sow to have it clean for your new seedlings, but weed and wild seeds have an amazing energy reserve. Poppies for example can remain dormant in soil for up to ninety years, one day you rake an area that hasn't been turned over in a decade and up comes a red carpet! Nice if ►



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As well as being true of edible seeds, looking at the natural environment/location of your plant will help make the decision on starting inside or out.



you have designer wellies and a photogenic smile, a disaster if you wanted a fine yield of organic vegetables. To avoid this I usually rake or hoe over a site a few weeks before I intend to sow to trigger the germination of weed seeds present in the soil already, that way when I weed just before sowing I know I have gotten most, if not all, of the ‘don’t wants’ out. Little tricks like that really do improve results and make

life easier, weeds compete with your seeds and new plants for water, soil nutrients, space and even sunlight with many weeds growing faster and thus shading out your seedlings, the more you get out the better for your emerging seedlings and the less backbreaking individual weed pulling there is ahead.

If sowing indoors, you will have more success with a soilless compost (disease and microorganism free).

I like to wet the growing medium before I sow, it stops the seeds being moved by the force of watering; if seeds are pushed too close together or too deep in it will cause problems later.

You can lightly dust with drier compost to cover unless the packet states a specific depth for the seed. The biggest mistake is to plant too deeply and the seed burns up its energy reserve trying to get to the surface. The second mistake is to over water causing a fungal disease

“One of the tricks that I have learned over the years is to water in with chamomile tea – it’s antifungal and so disinfects the growing medium before the seeds send out roots.”

that wipes out new seedlings. The third is to allow the compost to dry out just after the seeds hatch and so shock them into stopping mid germination. Watering the seed tray or recycled container first and allowing to drain for 10 minutes before sowing, surface dusting with sand, compost or vermiculate and finally covering with a propagator lid, cling film or plastic will avoid those problems and within a week or two you should see some action!

Some seeds take much longer so don’t panic if it’s not jack and the bean stalk instant. One of the tricks that I have learned over the years is to water in with chamomile tea – it’s antifungal and so disinfects the growing medium before the seeds send out roots. If you get ‘dampening off’ disease – this is where the seed germinates, gets to a few leaves and then goes black and dies overnight,

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or droops and slowly dies – then you have fungal infection in your soil mix or seed tray – that’s where the chamomile tea will become your ally with future sowings. Always clean your seed trays with hot water and a little washing up liquid before you fill with soil to sow, especially if they have spent the winter in the shed or just lying about the garden with muck on them. The nurseries sow in peat or peat substitute because a seed doesn’t need all the nutrients in soil, only the moisture and heat of a growing medium, then once up and growing they move it to a better mix and individual pots. You can sow in whatever medium you like, but don’t go buying the dearest compost as it really makes no difference at germination stage.

Some seeds do better directly sown into the garden, especially ornamental flowering plants, but also a lot of veg, which can be covered with cloches, recycled plastic bottles or fleece to provide extra protection. That said, crops like tomatoes, peppers, and aubergines all need to be not just started indoors but raised inside until summer planting out because they need longer periods of warmth to fruit and yield a good crop than our Irish climate/season allows. You can potentially lose more seedlings to the elements, foraging birds and insects with direct seeding, but it has the advantage of not having to move the seedlings into bigger pots and then ‘hardening off’ (acclimatizing them) from indoor to outside before finally planting in situ.

As well as being true of edible seeds, looking at the natural environment/location of your plant will help make the decision on starting inside or out. In general terms, a good decision making tool is the size of seed – on the whole seeds of a manageable size can be sown directly outdoors while fiddly small seeds very often require that bit of extra attention/protection that sowing indoors provides. Some very hard shell seed which feels more like a ball bearing, such as sweet pea, benefit from a soak in warm water over night or the scrape of an emery board or sand paper (on the side away from the seed ‘eye’) to break their dormancy. Pretty much most seeds can be started inside; even those requiring a cold treatment prior to germination – which as we know can be “tricked” by your fridge. All the information about your particular seeds will be printed on the back of the seed packet. A lot of seed packets are quite specific and give a strict regime for the seed, others give options for indoor and outdoor sowing, but at least now you can make an informed choice and follow some of the tips the packets don’t give. And remember, not every seed in the packet is 100% viable, it doesn’t mean you’ve done anything wrong if all 40 or all 1000 seeds don’t burst up.

That’s it – seed will become seedlings and seedlings become plants – just keep an eye in the first month for watering, sun scorch, frost damage, slugs and pests and once established you can just relax and enjoy. At least until they flower and produce their own seed, then it’s all the joy of beginning again. ■

Fiann Ó’Nualláin, Dublin,
www.theholisticgardener.com

‘Pricking out’ or transferring from seed tray to garden...

Having successfully got your seeds germinated and allowed them to develop a couple of leaves, now is the time to move them on.

The seed tray is too shallow for them to expand their roots and so you need to carefully move each individual seedling into a plant pot to grow on a bit more before planting them into the garden or your balcony containers – if you have gone the yoghurt pot route then you have more time. The ‘technical term’ for lifting a seedling from a tray and transplanting it to a larger container is ‘pricking out’. There are a few rules or a slice of technique to follow but you won’t need surgical masks and precision instruments for it, I find a sharpened pencil or chopstick is as good as

any brass handled dibber to prise up the plant and move it to a bigger pot. You know a seedling is ready to move when the first true leaves emerge, – this is the bit that confounds but the first true are really the second set of leaves to appear – it’s a bit like milk teeth and adult teeth. The first leaves are just a bit of photosynthesis energy to get the next spurt of growth and are often called the seed or cotyledon leaves, the true leaves come next and they can take the pressure of thumb and finger to help with the lift or, more to the point, to hold the plant steady while you transplant.

Never hold by the stem or roots. Always transplant into a firmed compost, previously watered but not soggy, with a receiving hole, (pencil dipped in), for the swift movement from tray to new temporary home. Watering in will fill the remainder of the hole (and push the roots into firm contact) with the growing media. Not every seedling copes well with transplanting so start with the sturdy ones and get as far as the amount of pots you have to fill. Within a few weeks the roots will fill the new pots and you will have a sturdy enough plant to dig in outside (if frost has passed).



Thinning out...

When you have sown direct into the garden the seeds often come up close to one another and are thus in competition, thinning them by removing weaker seedlings and making spaces between the seedlings enables a better root run and a stronger plant. If

its veg seedlings you are thinning then be conscious that a carrot seedling smells as strongly as a mature carrot to carrot root fly so thin on a still day to avoid wafting the tempting aroma on the air, and secondly, these thinnings are micro veg, don’t discard on the

compost heap, put them instead on a salad or in a sandwich and eat a bit of their high nutrition. If ornamentals you can try potting on the thinning for gift plants or to hedge the bets with a batch in a cold frame, greenhouse or window sill – if late frosts are lurking.



And then there were more

What happens when the bijou apartment or terrace you bought as a couple now has to house four or more? This is the first in a series of articles looking at how to make small spaces bigger without, in most cases, needing another mortgage.

Mindset matters

When your circumstances have changed and your home is under pressure then there are two ways to think about it. Option one is to see your home as just not being suitable and putting your energy into getting out of it as soon as possible. This will incur cost, time and effort and, as many people don't want to move from their chosen area but can't afford a larger property there, emotional upheaval as well. Option two is reorganising the space thereby avoiding most of that, and getting a better home in the process.

Changing times, changing places

With changed priorities you view your home differently and that's the start of seeing what can be done to satisfy these new demands on the space. It's not that you can just go Zen and calmly contemplate your way out of the mess of toys in your one 15 sq.m. living space. I do though have conversations with homeowner parents where it has dawned on them that when they were growing up, all the children in their family shared bedrooms and that nobody was irreparably damaged by the experience. If you live in an old house, take a look

*Bunk beds from Sibeal O'Sullivan
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at a census and see how many people, especially children, used to live in a space that you're having difficulty in fitting four into. Of course times have changed and the social structure that let that happen has also transformed, but it is a sobering exercise. We also have a lot more stuff now – especially clothes and toys for kids. A good starting point is often a clear out of both, most children have a few favourite toys and the rest are just taking up space.

Working with what you've got

The most important first step to improving your situation doesn't cost anything; be pragmatic. That's not to say you should throw your lifestyle aspirations out the window, but you have to be prepared to adapt yourself to the house as well as adapting the house to yourself.

Next is taking time to understand what you're working with. Every home is different so one solution will not fit all, even if the basic house structure is the same, for example a terrace or bungalow, but what they all have in common is potential. Unlocking solutions usually involves prioritising so thinking about what is most important to you in how you want to make use of your home, is key. At the outset therefore, identify the broad results you want to achieve and then move on to specific physical alterations or additions – not the other way around. The way some houses are laid out might preclude certain solutions, but by looking at what you've actually got with a creative eye you can often achieve what you want without having to resort to the wrecking ball completely. A very simple way to start this process is to get the floor plan drawn accurately. Just seeing that can often spark insights for homeowners, and there are an ever increasing number of apps and tools to help – it's not all about graph paper. Above all it must be accurate so invest in a scale rule – this allows you to draw plans in proportion to a particular scale – 1:100 and 1:50 are the handiest ones (that's 1cm=1m and 2cm=1m). Finally, tracing paper so that you can sketch out different ideas over the one set of measurements. You can get this in art supply shops.

Budget

Of course no discussion of what you're working with can ignore the bottom line. Take for example a small three bed house; you either have somewhere between €10 - 30K/£8 - 24K, a figure where you will need to be careful and strategic and limit the amount of building work. Opening up adjoining rooms, building or upgrading a shed to take storage overflow or to use as a utility are examples of what you can do on this budget. Spending a little on improving both the quality and quantity of storage is another sound approach. The smaller the house the more crucial good storage is – and the bigger bang you're going to get from your buck. Under the stairs is ideal for big drawers – for schoolbags, shoes etc. Alcoves either side of the fireplace, if you have them, are useful for things you might want to look at occasionally, including the TV of course. On the more design conscious side, but still at this budget level, you might get real results from a micro-

extension, a key piece of new space that is cleverly worked out and unlocks the house overall. Best of all is a solution that solves more than one problem. It also pays to think about how spaces are actually used and how different things happen at different times. If you open up that front room to the rest, do you need to be able to close it again when you want a space to get away from each other or from the kids? Making limited space work is about much more than just creating as big a single space as you can; paradoxically, that can often give a sense of there being less. Giving yourself options in how you want to use your living space on any particular day and for a range of activities is usually a better way to go.

In the situation we are considering here - smallish house, growing family - you may be in the second category of people who are able to spend between €30-80K/£24-65K. At this level you can afford to add some space, but it is crucial that the new space is made to integrate with the original house. Sometimes this might mean a big structural opening to connect the old and new, and the cost

*Micro extension
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of this can often pay for itself by you not having to build on so much. In any case, however they connect, it's essential to think about the overall layout afterwards and not just focus on the new extension. With a relatively limited budget like this it may mean building less in order to build better. Although it may seem far fetched, it is perfectly possible to build new space that ends up making the current space difficult or unpleasant to use.

What both of these scenarios have in common is a design led approach. It is the essential ingredient in transforming space, within budget, to solve problems.

More space or a better layout?

There are two key restrictions that might rule out extending; one is obvious. If you live with your family in an apartment and you intend to stay then you are working within the four walls and that's the end of it. Very, very occasionally families in this situation get the opportunity to buy adjacent apartments and amalgamate, and it can work, but it's rare to have that opportunity. In apartments often there is potential to improve the way the kitchen connects with the living space without ►

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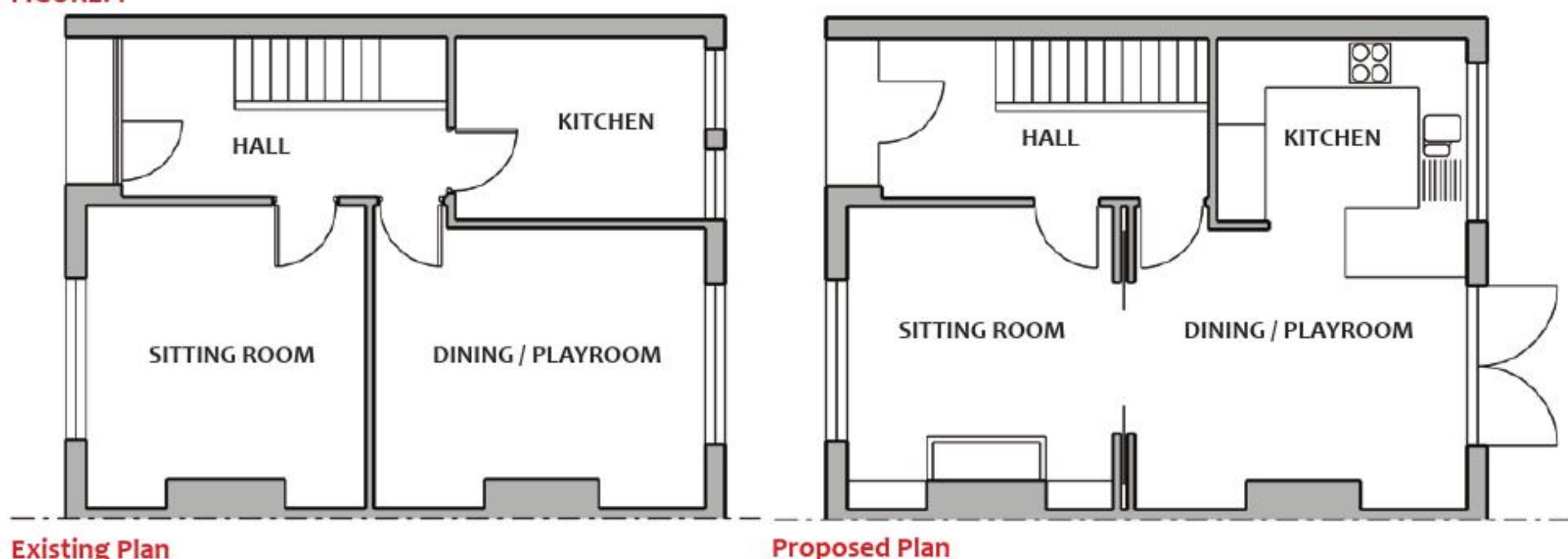
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FIGURE: 1

having to jump through hoops on fire regulation or with management companies. Beyond that it tends to require compromise to make any other big changes – losing an en suite to gain storage for example. So it really does come down to ripping out the developer's wardrobes and putting in something that uses up all of the available storage space. Clever (and that might mean custom-made) children's furniture that combine beds and storage can also yield dividends, as well as providing the kids with their own interesting spaces.

The other restriction that may rule out an extension is where the budget just won't stretch to building on new space. As in the situation above, help lies in the form of changes to layout and storage to make things work. Very often with houses there is a discrepancy between the layout of the house and the way you want to use the space to live. For most young families this means that the living spaces of the house are small and divided into many separate rooms – layouts that haven't evolved the way family life has. Nowadays most people want a space that allows the family (and guests of various ages), to be comfortably together at key times, especially for meals and social gatherings (including playdates). Some house types are quite easy to make work in this way with key alterations. For example, if there are three main rooms on the ground floor: sitting room, dining-room and kitchen, you can combine these by forming new openings and doorways to give you maximum space for those busy times (morning, early evening, weekends). At the same time you can arrange things so that the whole ground floor is not permanently open-plan. This can mean deciding to only connect two of the three spaces (say kitchen and dining) and leave the sitting room on its own. Or it can involve the use of folding, or (better), sliding doors that allow you the best of both worlds, which is something you might need if the overall house is small. **FIG.1**

Another aspect of living in a house with small children is supervision. Again this is often pointed out by homeowners to me as a drawback of the older-fashioned house layouts. It is often enough for a parent (grandparent, or child minder) to have a half-view of where children are playing – to be able to issue warnings or instructions, hear trouble,

or answer questions, without interrupting whatever important adult business is being conducted at the time. Again a degree of increased openness will help here, but it doesn't have to be a barn.

Often the way the house is currently laid out will help to define the best approach – and that might mean having a flexible mindset around how to achieve a result you are happy with. You might have had an assumption that the kitchen had to be in an open plan space, but paying heed to the existing house and the budget might mean having a standalone kitchen and focusing on other areas to provide a larger social space. Even where you do have a standalone kitchen it is often possible to add somewhere for a guest to sit or a child to play that is out of harm's way while a parent is slaving at the cooker. This whole approach gets even more pertinent where the house is very particular to begin with – often the case with small bungalows or rural housing, urban cottages, and old houses in general. **FIG.2** ▶

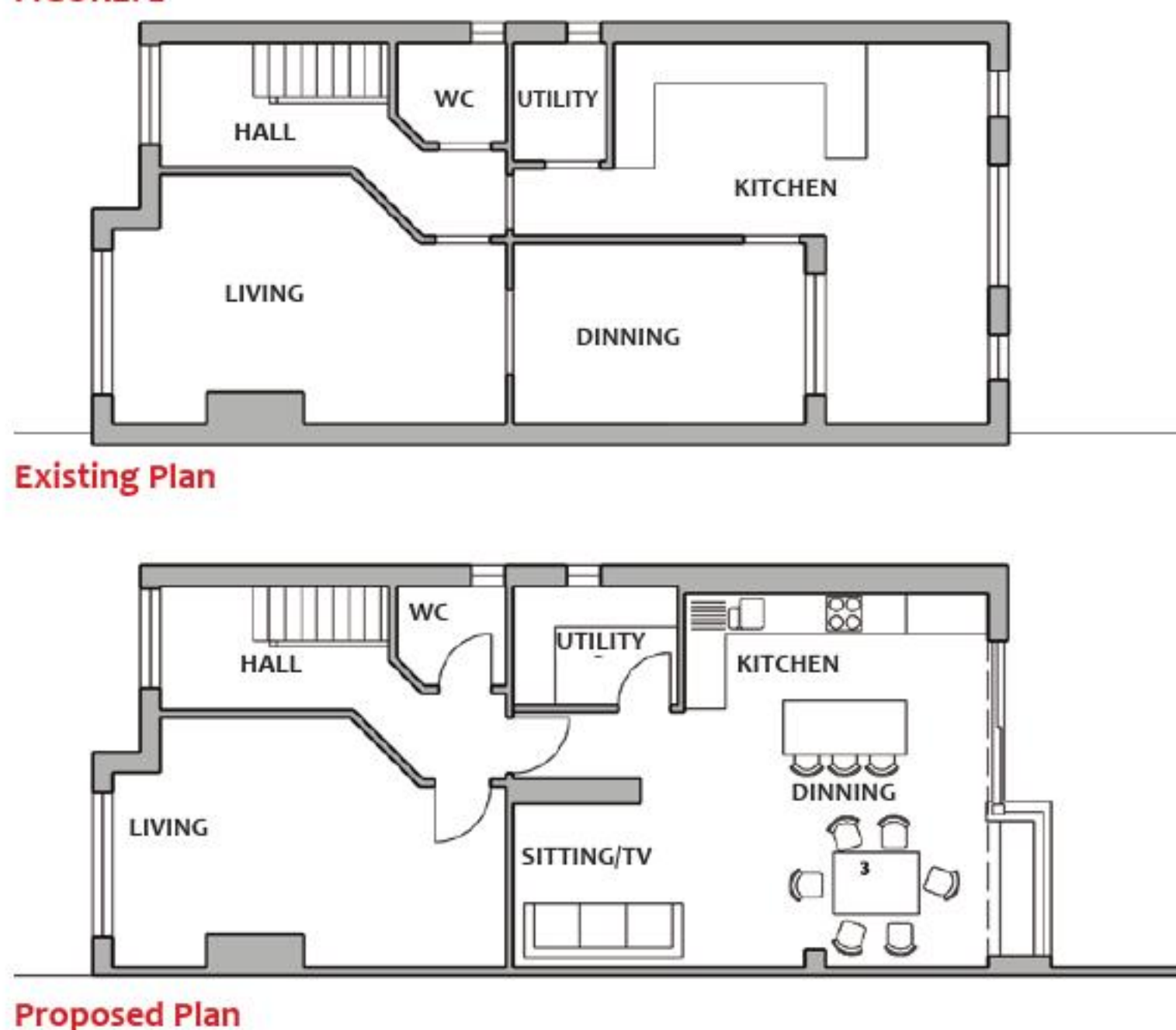
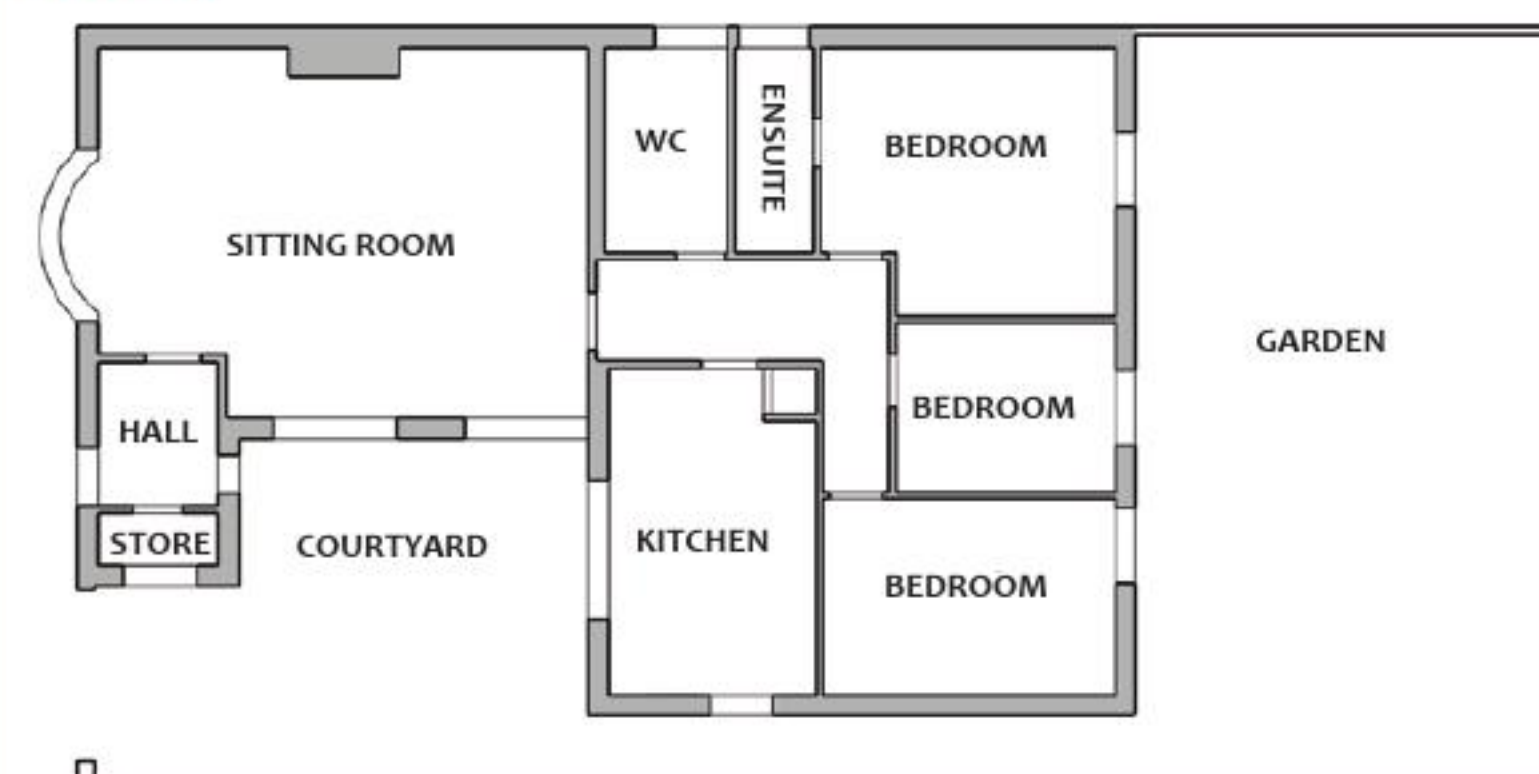
FIGURE: 2

FIGURE: 3



Existing Plan



Proposed Plan

The micro-extension

It is a point of view I often hear, that if you are going to extend you might as well build the biggest possible one you can. It's not that this view is always wrong, it just usually is! If you're extending then you should be doing it for particular reasons, to achieve particular results, and once you have allocated enough space to do that then you should stop. I don't buy the argument that adding a bit more and a bit more again is going to be relatively cheap, so you might as well... (This is one you often hear from builders who feel they have their foot in the door, when talking to homeowners who have not properly thought things out). Enough is as good as a feast and where budgets are hard-edged the economy of scale argument gets a bit academic – what will matter to you is how far you can get with the money you have to spend. The option of going into debt in order to finish the job is not really where you want it all to end so try to avoid overstretching.

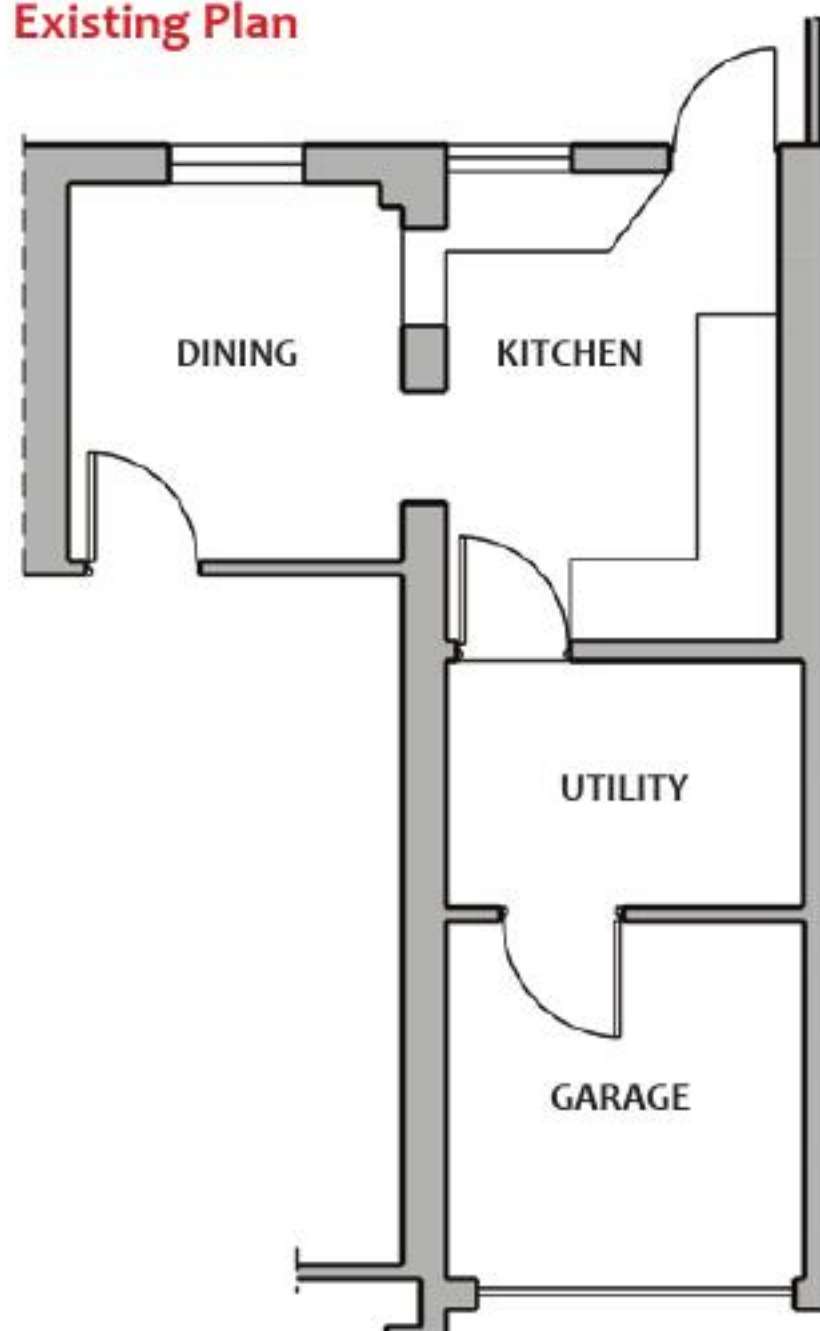
There are two key ways of creating a successful small extension. The first is where there is a small extension to a living space that serves an essential function or unlocks the overall space. Sometimes this can be as small and specific as a sunny window seat that changes how a whole space feels. **FIG.3**

The second is the small hard-working extension that takes care of the 'back of house' type functions and frees the rest of the house up. You can build a small extension that combines utility, storage, WC, or sometimes the kitchen, and the original spaces are left free to breathe easier. This is often especially appropriate if you have space to the side of the house. **FIG.4**

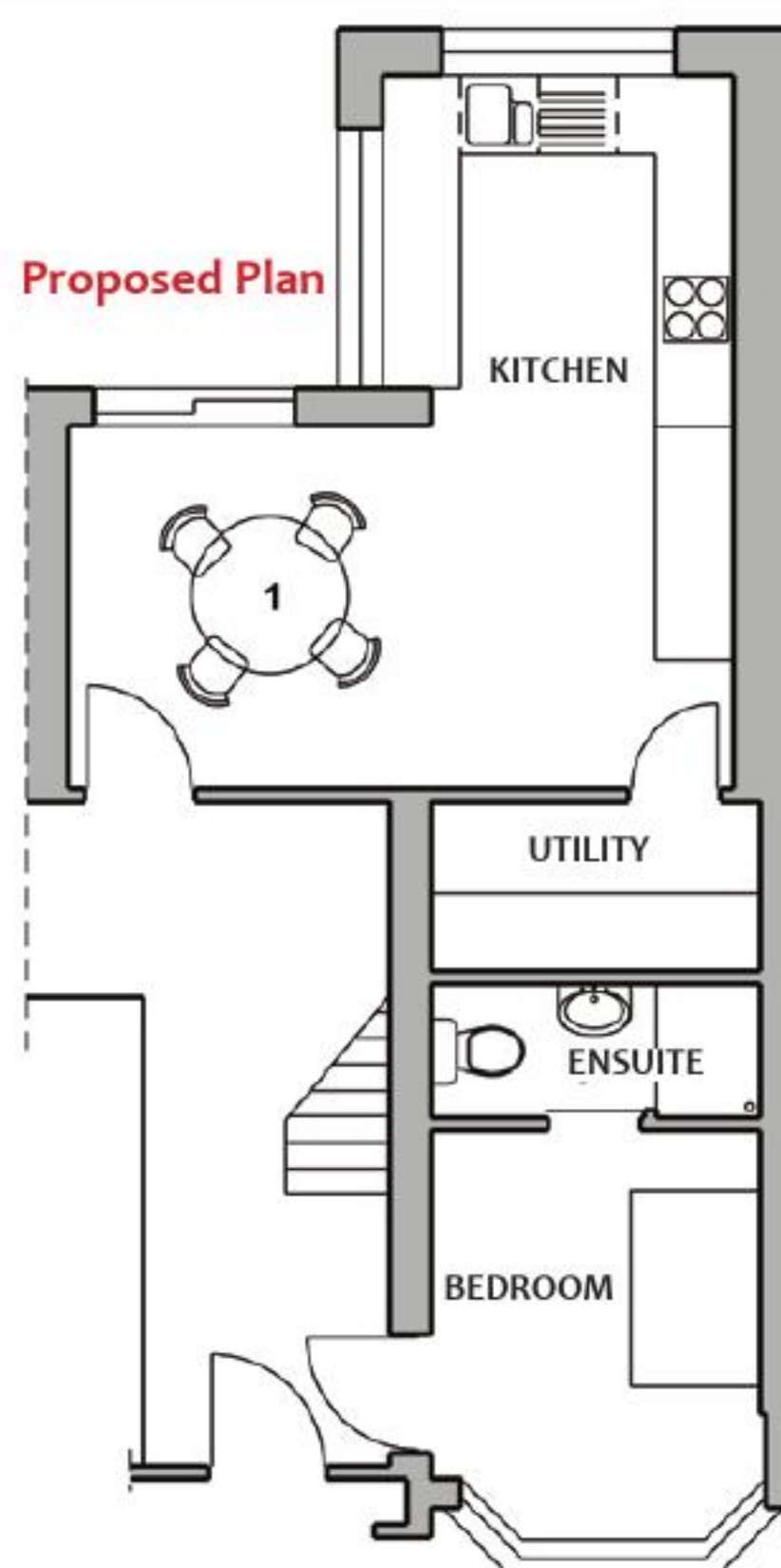
Enough is as good as a feast and where budgets are hard-edged the economy of scale argument gets a bit academic - what will matter to you is how far you can get with the money you have to spend. The option of going into debt...is not really where you want it all to end...

FIGURE: 4

Existing Plan



Proposed Plan



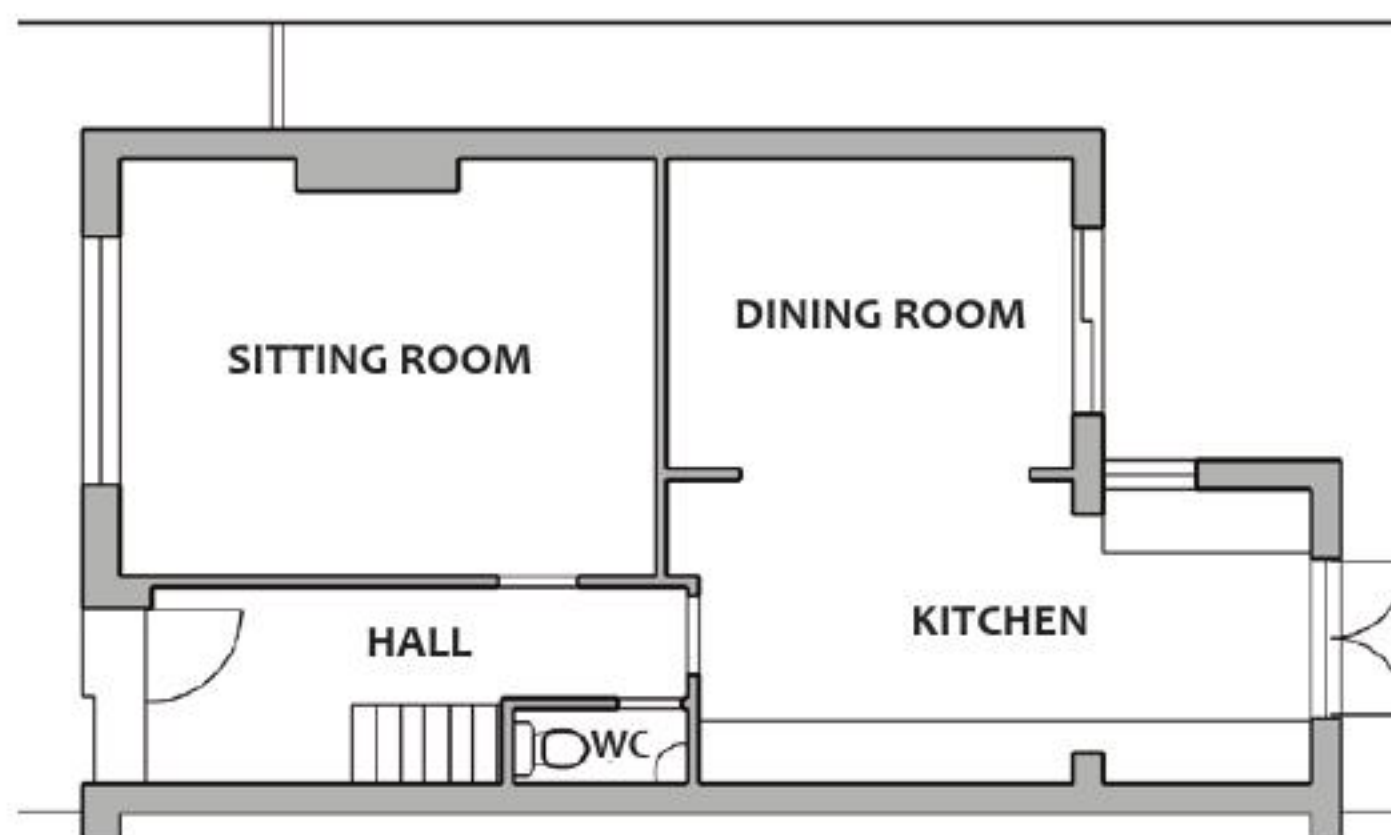
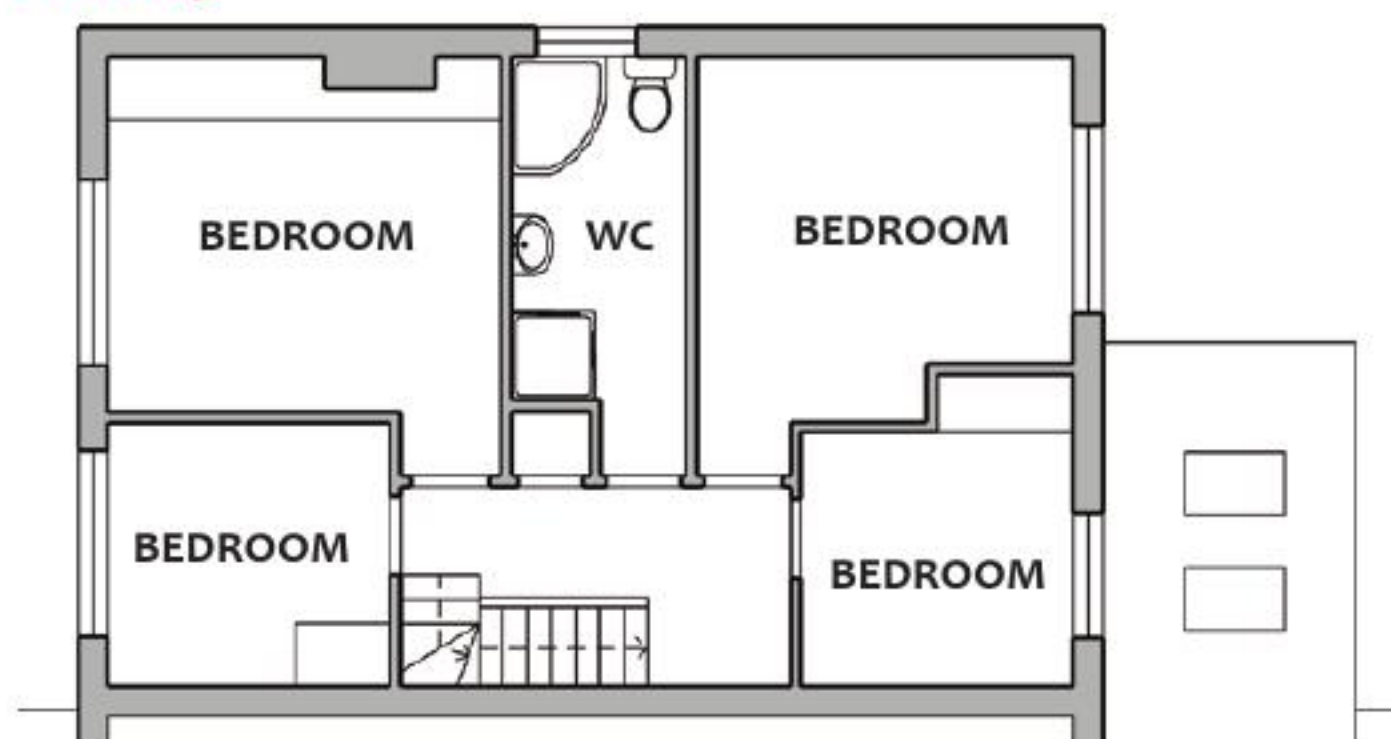
The bigger extension

Moving up the scale slightly, there are the options you might have if you were to build on say 20sq.m. or more of new space. It is worth reiterating here the warning given earlier about thinking through what you want to achieve in terms of lifestyle, not just how the extension works. A poorly considered extension can lead to dead space, dark spaces, poor flow through a house, and unused rooms.

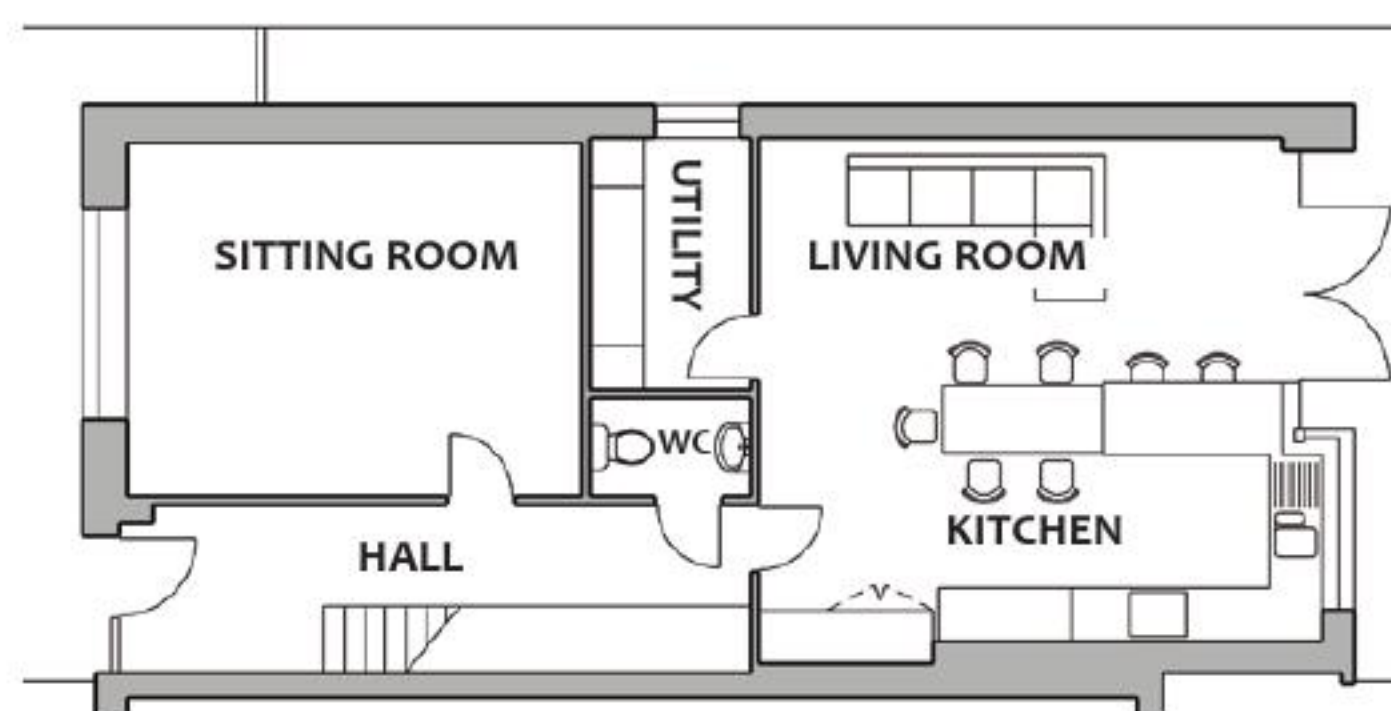
A poorly considered extension can lead to dead space, dark spaces, poor flow through a house, and unused rooms... what is very important is ensuring that the space in the middle of the house doesn't become dark and unpleasant as a result of the extension.

The most common type of extension is probably making space for a multi-purpose family room at the back of a house, connecting to the garden. This is a need that many older and most recent houses don't provide enough space for and it usually means opening up the back wall and building an extension so that the new and some of the original space work together to form the family room. Bear in mind that you also have to balance the size you build with how much garden you leave yourself. What is very important is ensuring that the space in the middle of the house doesn't become dark and unpleasant as a result of the extension. There are ways of tackling this. In all cases the judicious use of roof windows will help enormously – the closer to the existing house the better. After that, one approach is to put functional spaces into part of the dark middle zone – the downstairs WC, a utility room etc. This usually means having a front room that doesn't connect directly to the big space at the back, and that's ok as in most cases you will want a space to get away to anyway. It can make sense sometimes to actually reduce the size of the front room in the process. These are often too small to be the key social space in a house anyway, so they can work better as cosier evening-time spaces for you to retreat to. Sometimes of course the exact opposite approach makes sense, where you keep the front room open to the space at the back, usually with doors of some kind for flexibility. This can be particularly true where the best sun is at the front of the house, and you want to get the benefit of it. In such cases the challenge is to find space for the mundane things – the washing machine, the ironing board, the clothes horse – without making a mess of the layout in the process. It is easy to focus on the nice bits and neglect some of these practicalities, but if you do that you will regret it. Like the smaller scale changes above, with bigger extensions it also pays to work from an understanding of the house you have – the right extension is the one that solves your issues, for your house. **FIG.5** ►

FIGURE: 5



Existing Plans



Proposed Plans



Roof space conversions

Converting a roof space is attractive because it's a relatively quick job and the cost is to some extent contained. A lot can be gained by setting it up as an accessible storage room or even converted into a fully integrated additional floor, but check out the fire regulations first as these are quite stringent and will have a bearing on what you can do. Before getting carried away by the opportunities however, and especially if you have a young family where the issues are usually day to day storage and quality of living space, then spending €15K/£12K on a roof space conversion is not going to solve the most pressing problems.

One last observation – small children can get very excited about home renovation. For the majority of projects it is dangerous and inadvisable to stay on in the house with children while work is underway. Better to avoid danger completely and bunk in with granny, or rent, and expect a lot of questions from the kids about when they can go to live in the 'new house'! ■

Stephen Musiol, Small Spaces, Dublin
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Roof space conversion

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the layout had become awkward to work with and at the same time, realised they could make much better use of the fabulous views..

Recognising that the house wasn't working very well is one thing, knowing what to do quite another, which is why they brought in an architect. ►



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As Heather said, 'It's very difficult when you're used to living in a house to be able to see it as just floor area and views.' The couple heard about Ian's work through word of mouth and when they met him were impressed by his approach. 'He began

by asking about us, how we lived and the main purpose of the house now, and in the future. It was only after doing that exercise, which was useful for us as well, that he went on to make suggestions about changes to the layout. The scheme he proposed didn't involve going either up or out, it was all internal so we didn't need planning permission. Instead he helped us to identify where the main focus of the house – kitchen and living area – should be located.' At the time, as is so often the case in houses of this period, (1960's), the kitchen was at the back; the new layout has it at the centre of the house. Standing in the kitchen there is now a wonderful view out through sliding glass doors ('the biggest we could get'), which have excellent seals to keep them weather tight, something the existing glazing was most definitely not! Given their coastal location it is important that the fabric performs well and that includes the windows which were double glazed, but the seal had broken and so these were replaced with new. The glazed doors open out onto a patio that's used winter and summer and which proved to be a perfect spot for a sunken hot tub, a feature enjoyed by the family all year round. Instead of a garden to look after, they can relax with the magnificent seascape as a backdrop which, as Heather remarked, is different every day and doesn't require either weeding or the grass cut!.

The second major change involved altering the ►





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layout at the front. 'There were two entrance doors at the front of the house, one of which we never used; it now opens into a shower room. I know that might sound a bit odd, but with a family who all sail it's brilliant! They wear wet suits and used to arrive back leaving a trail of wet, salty and sticky seawater through the house. Now they can walk straight into the shower room and strip off in there.' Taking the idea one step further, they also fitted an outside shower in a secluded corner, an idea which came from a family holiday in Costa Rica. 'We showered outside the whole time there. Of course it's roasting hot and you wouldn't want a cold shower in this climate! But we said 'why not have a hot shower outside? In Costa Rica we had monkeys sitting on the wall beside us, here we have fabulous sea views which I think I prefer!'

The second front door now opens into a hallway connecting the living area with three further bedrooms and a bathroom in addition to the new shower, where once there were only two bedrooms and a bathroom. The roofspace above is floored for storage and now reached by a folding ladder. By removing the staircase, an extra bedroom was created. The master bedroom with en suite lies off the living area, and is accessed via the new central kitchen, which is approached from the opposite end of the hall to the bedrooms.

During the build, the family were based in Belfast and although they visited the house, they were confident in the ability of the builder to carry out their plans accurately. 'If the builder had a question, he was quick to contact me, he was excellent. He had been recommended to us by the architect and some of our friends had also used

him so we knew we were in safe hands.' A house of this age requires heating and with far more efficient boilers now available, Heather and John decided to replace the existing one with a new oil fired model to heat the radiators as well as provide hot water. The couple did seriously consider solar panels because the house is south facing, but in the end took their builder's advice and didn't go ahead. 'We figured financially there would be a long payback, the house heats up very well, gets a lot of solar gain and rarely feels cold. We're kind of outdoorsy people anyway and the shelter from the other ►



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houses and a big hedge help to protect us from the south westerly gales. In winter we draw the blinds and they are very good also at keeping the heat in.. The kitchen is always warm from the oil fired Aga cooker which moved from the back of the house to the centre, and a log stove now uses what had been the cooker flue.' To complete the overhaul, the house was rewired and replumbed ('the drains were very old').

When the house was built, natural daylight was less valued but times and tastes change and creating a light filled house was a priority for Heather and John. 'Anytime we've bought a house we've had a compass in our hand to make sure it is orientated to get the best possible light. 'Although the kitchen is in the centre of the house, it is very bright from a large roof window, something of an afterthought as Heather explained. 'I went down to the house during the build one very sunny day, walked inside and realised the kitchen didn't feel as bright and light-filled as it could have. The builders were about to block off the roof when I asked them to stop and put more roof windows in. It added a few more thousand pounds to the cost but I'm so glad I thought of it. I caught it just in time and it's really made a world of difference' In keeping with the practical approach to their lifestyle, as Heather trains puppies to be guide-dogs, wooden floors were chosen for ease of cleaning and convenience.

What would the couple say to others thinking of an internal remodelling of their existing house? 'Our requirements are probably different to most people. We have three teenagers who love sports and being in the water means mess, lots of wetsuits and mud. As sailing is something we will do all our lives, it was important the house reflected that, so in general we would advise thinking about what you do most often in and around the house and use that as your starting point.'

Apart from the requirements that come with being a sailing family, most importantly the couple wanted to create a house their family would love too. 'We find they want their friends to come to our house and at one stage we had something like 18 people in the tub !. It's only meant to hold eight so it got quite busy! Very often their friends stay over which is great and they haven't wrecked the house yet!'

Gillian Corry and Catherine Doran



Build spec

Walls: 100/100/100 cavity with 90mm EPS insulation. U-Value around 0.30 W/m²k

Roof: Trocal (single ply pvc membrane) on 90mm Polyurethane insulation (Kingspan TR26). Existing ceiling insulation throughout dwelling upgraded to a total of 200mm mineral wool insulation. Extension roof U-Value around 0.22 W/m²k

Floor: Suspended timber floors extended with new 150mm EPS rigid insulation board between new and existing joists. U-Value around 0.25 W/m²k

Windows: Double glazed, Argon filled with low-emissivity "K-glass" coating. U-Value of around 1.7 W/m²k.

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“

The whole thing was complicated by the fact that it was a parish asset in Wicklow. We needed to go before The Commissioners of Charitable Donations and Bequests for Ireland and then get permission from the local bishop before we could actually buy it. ”



Primary numbers

Many of us spent our school years shivering in a draughty schoolroom or cuddling up to the nearest lukewarm radiator. Insulation and heating may not have been a priority in our schools back then, but that hasn't stopped Stephen and Rachel Conway from transforming an old primary school into a modern, super energy efficient home.

Rachel and Stephen began their search for a new house in Dublin and the surrounding counties. Rather than settling on a standard dormer bungalow or a semi-detached property, they decided they were after something a bit more interesting. 'That's when we came across the school, which was actually advertised as a three bed detached house. From the off, we were looking for something we could put a bit of work into so the school caught our attention.'

This proved to be anything but, the couple certainly didn't go with the easy option. A mixture of a conversion, refurbishment and new build, Stephen and Rachel had several hoops to jump through before securing the school. 'The whole thing was complicated by the fact that it was a parish asset in Wicklow. We needed to go before The Commissioners of Charitable Donations and Bequests for Ireland and then get permission from the local bishop before we could actually buy it. The Commissioners only meet four times a year so it was a long process.' Added to this, Rachel changed jobs halfway through making the already difficult task of obtaining a mortgage that bit more daunting and it was two years before work on the school got underway. ►



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A typical small primary school in lay-out, the building consisted of seven toilets, two classrooms, a headmaster's office and a cloakroom. An architectural technician friend of the Conway's worked closely with them and put them in touch with the architect they employed. Added to this was an engineer and a main contractor who also oversaw the demolition of some of the building. Fortunately the main 1960s structure was in good condition so, apart from the new flat roofed area, it was a case of insulating and repairing as much as

they could of the existing roof and walls.

'The challenge with an old building is working out where and how to arrange the living spaces, the best combination for workability as well as what is logical'. One solution was to lower the 3m high ceilings in the classrooms to create the first floor and the C shape of the building lent itself to filling in with a new, flat roofed section. The result is a large open plan area opening out onto a patio.

'You see these schools all over the country,' Stephen continued, 'they're almost identical. Two classrooms with really tall windows ran along the front of the school so we had to decide if we wanted to keep the look of the school, or put in new windows.' Deciding to keep the windows intact meant that they project into the new first floor, an unusual but successful feature. As the Conway's found, renovating an old building to modern standards means principles sometimes have to give way to higher goals. One such was a plaque on the front of the building with the school's name. 'We externally insulated the building but wanted to keep the original plaque, so brought it out with the result that we have a bit of cold bridging through there, but it's such a piece of history and integral to the character of the house we decided to accept the consequences.'

To ensure structural integrity, an internal steel frame now braces the external walls, supports the new first floor and allows the existing roof space to become integrated with the rest of the house. The internal dividing walls are concrete block and the ground floors, both existing concrete and suspended timber, were replaced with a new screed. The new first floor is suspended timber. ►



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Stephen explained the reasoning behind the new floors. 'Our first thought was just to replace the timber one in the classrooms, but then we realised that if we did both then we would have a fully insulated ground floor and an even surface throughout; we knew this was our only chance to do that. It did go against our instinct to preserve as much as we could, but we felt better once we'd done the roof because we re-used a lot of the timber before cladding it externally in zinc.'

Triple glazed aluminium clad passive rated windows proved a major cost. 'They were a huge element of the project, we have about 70 and they're all different! But we chose the best we could find and they are performing very well.' Because the external insulation wraps around the window frame and beneath that the frame is taped to a vapour permeable membrane, as Stephen pointed out, they are now fully intergrated into the structure, so, (apart from the cleaning), they are very happy with their choice.

'When we began this project' Stephen continued, 'our overall objective was low energy costs. To achieve this we put 150mm of insulation on all of the outside walls and filled the 100mm cavity in the existing walls as well as the 125mm of the new ones. Internally, the whole building is sealed in a continuous vapour permeable membrane. We really went to extreme lengths to try and make sure we got what we wanted and because we did it ourselves, we could afford to spend the time to do it properly. I learnt a lot from watching YouTube videos as well as those from manufacturers. It's not rocket science, you just need to have excellent attention to detail.' The result of all this effort was an impressive airtightness reading of 1.9ach.

'In retrospect, one area we might have done differently is the roof. We put a lot of roof windows in along with a big dormer section so to do that, we removed all the tiles and timbers. Then we put ►







them all back, as they were. With more time and money we would have replaced the roof with a new wind and airtight structure but it was in such good condition that at the time it felt like a shame to rip it off.'

Renewable energy is the main source of heating and hot water, although the former isn't needed until late in the year. 'We've got solar panels on the roof and a log stove with a back boiler. The solar panels in particular are brilliant, we're in November now and we still haven't put the heating on. We have a 1000 litre water tank and today was a sunny day so that's up at 45 degrees at the moment. We might put the fire on this evening for a short while just to heat the water up a bit and on these dark nights a flaming fire is very attractive!'

As a trained engineer, Stephen had more than a passing interest in the M&E aspects of the house; his systems are a lesson in getting the maximum out



of a minimal amount of renewable energy, very simply. Over to Stephen.

'The core of the system is a 1,000 litre thermal store which is divided internally by a perforated membrane. The top 500 litres for domestic hot water use has priority, receiving warming first from our solar thermal panels and secondly the log stove. Once this is up to temperature – 60deg. in summer and 55deg in winter - the lower section is heated and from this is drawn any room heating required. Returning to the hot water, there is none stored, as fresh water is drawn from a well and piped through an external heat exchanger from the thermal store to heat water on demand, with a flow and temperature controlled variable speed pump to adjust the temperature delivered at the taps. With no warm water storage for domestic use there is no danger of possible contamination, the hot water is literally spring fresh.

Heating and ventilation are combined yet individually controlled, the basis is a warm air system that is very flexible to take account of the varying needs for fresh air, warm air or the removal of moisture. Each room is individually ducted from a central supply channel, 'wet' areas are separately extracted through ducting which runs past a heat exchanger before exhausting to the outside.

Apart from the supply and extract ducts in each room, there is also a programmable thermostat to enable us to put warmer air into the room. This we do via a heating element rather like a car radiator in the air handling unit, which is fed with warm water from the thermal store. To take an example, when a zone requires heating, all other zones close, a pump supplies warm water from the thermal store and the air handling unit increases the speed of the air to heat the room as fast as possible.

Once the room is at the desired temperature the system reverts to a slower speed and all zones open.

Another aspect is the ability to vary the amount of fresh (heat recovered) air and recycled air by means of a mixing module on the air handling unit. The ratio can be changed to adapt to different conditions. For example in summer, fresh air makes up the majority of the air to keep the house cool; during extreme cold the fresh air is reduced and recycled air increased to maintain a comfortable room temperature.'

Stephen admitted they feel a great sense of satisfaction with their achievements. 'Our only bill is electricity, typically €100 a month and it's pretty much the same summer and winter. I see oil trucks pass me and I feel quite smug! If we were to move, I would do exactly the same as I have here. Unless you're building a square box of a house, getting it really energy efficient is a challenge. The next best thing is passive for nine months of the year and for the other three, put the fire on to heat the water a little bit. The only downside is that it's not an automated boiler.'

The former schoolhouse is now a family home with three bedrooms, four bathrooms and a central corridor running 12m long, a perfect play area for their two year and six month old children. Bamboo flooring and ash doors were specified throughout the house, with clean white walls inside. 'We ►

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approached the interior fit out not being exactly sure what colours to commit to and keeping the spaces as open and airy as possible.' There are LED bulbs throughout but, owing to the abundance of natural light that fills the house during the day, even the cost of lighting is minimal.

Flatpack furniture is a byword for trouble but, as you might expect, having completed renovated and remodelled a house, Stephen and Rachel didn't think twice about that when they chose their kitchen from a large chain store, the special offer was much more important! The island unit was constructed from two work tops glued together and the combination of beech counters and cream gloss units below give the room a fresh but warm atmosphere.

Would they change anything? 'Possibly the order in which some things happened. We were expecting our first child halfway through the process so we had to try and get finished up quite quickly. But in saying that, we probably would have only made cosmetic changes. We had a very large input into the entire process, and we're very happy with how it turned out.' ■

Catherine Doran

Site size: 2.5 acres

House size: 4,500sqft/418sqm

Build spec

Walls: The 100mm cavity in the existing external walls were pump filled with silver bead insulation and the walls were further insulated externally with 150mm of rigid EPS insulation carried down below plinth level. The external insulation was rendered externally with a self-coloured acrylic render. New build masonry walls have a 125mm cavity with 100mm concrete block inner and outer leaves. The cavities are either fully-filled with rigid PIR insulation board or with the pumped silver bead insulation depending on location, and the relationship with the existing cavities in the existing walls which were retained. Again, all new external

walls were further insulated externally with 150mm rigid EPS insulation board, and rendered with the self-coloured acrylic render. U value of both 0.161 W/m²K

Ground floor: 100mm concrete screed incorporating underfloor heating circuit on 120mm PIR floor insulation on concrete subfloor. U: value 0.15 W/m²K

Roofs: The existing sloped roof, and all new sloped roofs, are insulated on the slope with 160mm rigid PIR insulation boards, in two layers of 80mm each, tightly fitted and sealed to the full depth of the existing rafters. The rafters are further insulated internally with a composite lining board, comprising of 50mm insulation and a 12.5mm plasterboard skim finished as the internal surface. Breather membranes and vapour barriers appropriately located remove the need to provide ventilation to the roof construction allowing us to insulate to the full depth of the existing construction.

U value 0.118 W/m²K

The new flat roof to the Family Room extension is insulated with 200mm of rigid insulation board laid in two layers, 100mm between the flat roof joists and a second 100mm continuous layer above the rafters. The roof is finished externally with a proprietary flat roof membrane (Paralon) topped with gravel.

The new dormer structure is similarly insulated to the flat roof detailed above, including rigid insulation board between the studs of the cheek walls, and further lined internally, but the whole of the dormer structure is clad externally with zinc.

Floors: The existing ground floor was dug out, and was replaced with a new insulated concrete ground bearing slab on 150mm rigid PIR insulation board. Slab perimeter edges were also insulated with 50mm insulation. The ground floor is finished internally with bamboo flooring.

U value 0.111 W/m²K

Windows and external doors: triple-glazed, low e 4mm panes with 16mm space between panes, argon filled. Frames are alu-clad timber.

U-Value 0.80 W/m²K

BER Rating: A3; 7.86 kgCO₂/m²/yr



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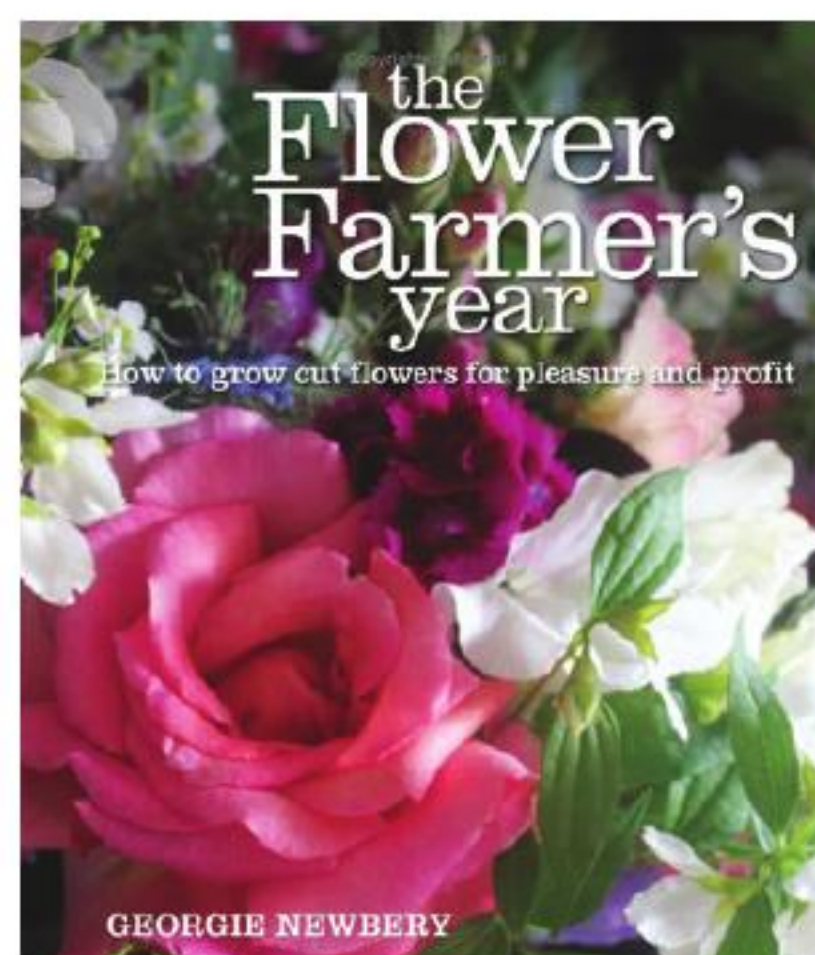
THE FLOWER FARMER'S YEAR is one of those welcome books that not only covers a great topic but imparts a range of skills that are transferable to even the smallest garden. It's written with infectious enthusiasm and perfected expertise by a leading cut flower producer who shares her secret of how to fill your home with flowers year round, and also how to take that next step, if you choose, in to commercial production.

It's a great practical manual filled with personal insights peppered liberally throughout the book. For example, under the headings of 'what we have learned' Georgie gets to the first hand nuggets of how to treat a specific flower or manage a horticultural technique; this is not just insightful but reassuring and genuinely benefitting to novice and long standing flower growers alike.

Often books about floristry or flower cuttings concentrate on plant profiles and

vase life, however *The Flower Farmer's Year* is comprehensive in its scope, tackling everything from planning your garden to budgeting and marketing a cut flower business. So, if you want to harvest table flowers from your balcony or garden or if you want to make your productive plot pay off by growing for florists and farmers markets, then this is the book to guide you through.

Through the year and all the many planting and cutting options, it covers how to start a cut-flower patch and what to grow, cutting, conditioning and presenting cut flowers as well as looking at bulbs, shrubs, herbaceous plants and even creating a hedgerow for Christmas decoration. If you are of a mind to make it a future business, there are some great sections on starting out in the cut-flower trade with advice on marketing and social media, where to sell and a flower farmer's year planner to keep you on track. If



you are interested in keeping it a hobby then certainly it will provide the skills to successfully reap the pleasure reward.

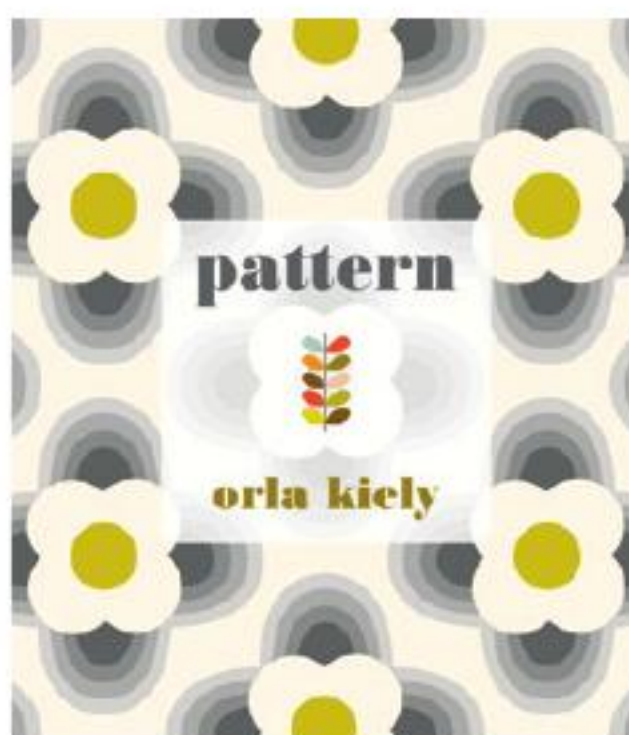
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between the covers

Pattern and Home

THESE TWO BOOKS by Dublin born interior and fashion designer Orla Kiely are quite unlike any of the interiors books previously reviewed on these pages. Not for her an exploration of colour or styles worked through room by room, instead they are an explanation and exploration of her design for life and of life. 'Pattern' she writes,



'is not a trend for me, to be taken up one minute and abandoned the next when the winds of fashion change. Pattern is in me. It is my life.' From this standpoint, Ms Kiely explores pattern in her early life, as the inspiration behind the start of her business, the influence of colour, transferring patterns to printed materials, fabrics and the subsequent collections and finally pattern in the home whose interior design should, she states, mean

'... having the courage of your convictions so that your surroundings truly reflect what you like and what gives you pleasure – an emotional rather than a financial investment.'

Design, Ms Kiely believes, comes from within and this is the basis of *Home*. For her, the clean lines, functionality and colour of the designers working in the mid-

20th Century are '... part of my visual reference library. The Orla Kiely look is contemporary but the ingredients grew from mid-century roots.' This second volume is therefore an exploration by the author of the influences that have led to that instantly recognisable Orla Kiely look. It is thoughtful, insightful, personal and, following that introduction, demonstrates why the mid-century architects and interior designers provide her with so

much inspiration and guidance, through case studies of homes around the world from that era. Beautifully and clearly



illustrated, both books are essential reading for anyone interested in design at every level and from any aspect.

Gillian Corry

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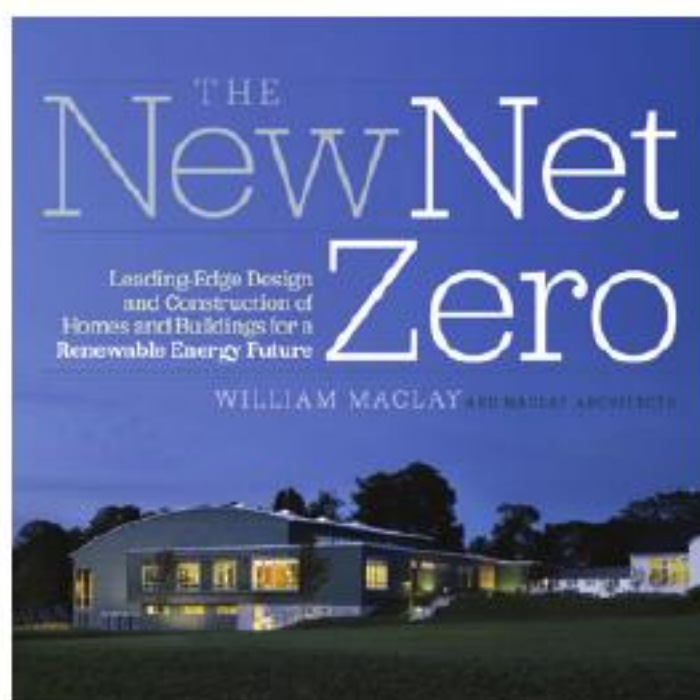
The New Net Zero

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IN THE FIELD OF sustainable development, the concept of Net Zero is growing rapidly and this book provides a philosophical underpinning combined with practical strategising through to construction detailing.

A kind of roadmap is proffered on planning, design and construction of Net Zero buildings, incorporating both hi-tech and low-tech solutions mixed with a good dose of common sense. The material should inspire and enhance the knowledge of building designers, students, builders and building owners but also product manufacturers and suppliers.

Building on a reasonably substantial theoretical foundation that includes



energy performance calculations as well as economic return, the book is punctuated with numerous and diverse well illustrated built examples, some of which provide working details as well as performance and cost analyses. The illustrations are legible, suitably complementing the text which is well written and

builds understanding in a logical manner. Tables are commonly used for clarity and order and facilitate systematic comparison of projects whilst an index to the rear facilitates thematic enquiry.

More information would have been useful on: the significant issue of thermal bridges and their calculation; windows U-value calculation, their constitution, including thermally broken

frames, and the achievement of comfort; vapour diffusion and the hygrothermal performance of different materials (especially for retrofit); and the critical function of mechanical ventilation and heat recovery in highly airtight buildings, including the constitution and maintenance of the units.

But these are relatively minor quibbles and can easily be addressed in a later edition. The emphasis is on the 'fabric first' approach to achieving the Net Zero standard and the author acknowledges the standard 'is not black and white but varying shades of grey', a statement that might also capture the author's sensitive approach and selection of material and examples for this book.

Art McCormack

The New Net Zero, William MacLay, ISBN 978-1-60358-448-7 (hardback), 552 pages, Chelsea Green Publishing, \$90, www.chelseagreen.com

between the covers

Build your own brick house

WHILST THIS BOOK TITLE SUGGESTS a focus on building with brick, it has more to do with self-building in general. The author Gerald Cole, states in the preface, 'this book aims to make the process of self-build a little simpler, easier and cheaper.' That very process can indeed be incredibly empowering but is also full of pitfalls; we make mistakes and learn from them.

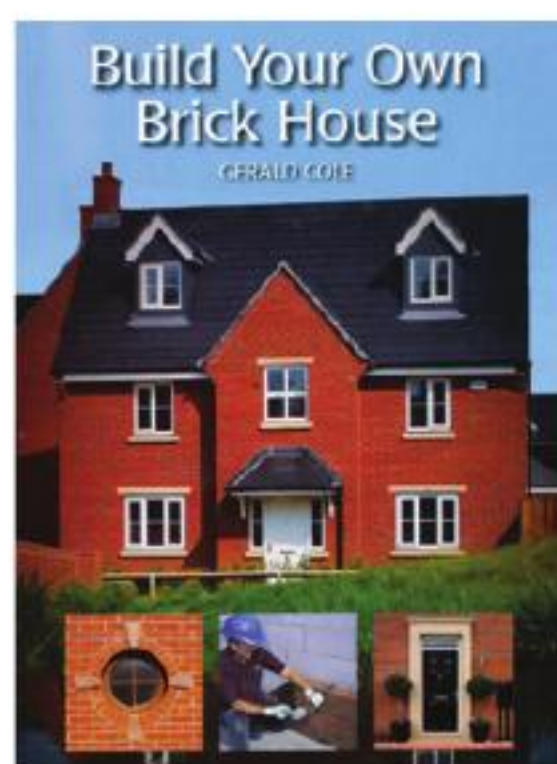
Cole shares his valuable experience in an open and informative way, starting at the beginning with chapters on Why to build with brick and How to Self-build through to Completion and Snagging. He shares his passion for the subject and offers little nuggets of information that could only come from someone who has been there and done that.

Self-building is about organisation and a disciplined process; with that in mind this book will help the self-builder establish the ground rules as it is well structured and easy to read. The text is also interspersed with highlighted sections, short summaries of specific issues for which you get a flavour

quickly, and the illustrations/photographs are a helpful accompaniment. This isn't a cover to cover read, more a book to dip into for help prior to the self-build process or during it.

The author acknowledges that building a house is probably the biggest investment we will make in our lives and the chapters on obtaining finance and those relating to the legal aspect of the process are particularly well covered and reinforce the need to do this right and protect the investment.

Subjects like The Code for Sustainable Homes and green issues are touched upon but personally I would have preferred to get more of his input as these issues are central to the whole way we as a society now approach the construction of a dwelling. Note that the book is aimed at UK readers; however the content is relevant to NI and ROI as long as



specific advice on Planning Law and the Building Control Regulations are clarified by a professional.

In Ireland there tends to be some brick used closer to and in the major cities, (especially Dublin and Belfast), and where the brick is sourced (e.g. counties Laois, Cavan and Tyrone). It is not a common material in the countryside which is a little different to mainland UK where it is widely

used everywhere, apart from areas that have a local stone in abundance.

While you may not necessarily build using brick, this book is still a great buy for any Irish self-builder's library.

Colin Bell

Build your Own Brick House, Gerald Cole, Crowood Press, www.crowood.com, 240 pages, 250 colour photographs, ebook £20, hardback £25, ISBN 9781847974853



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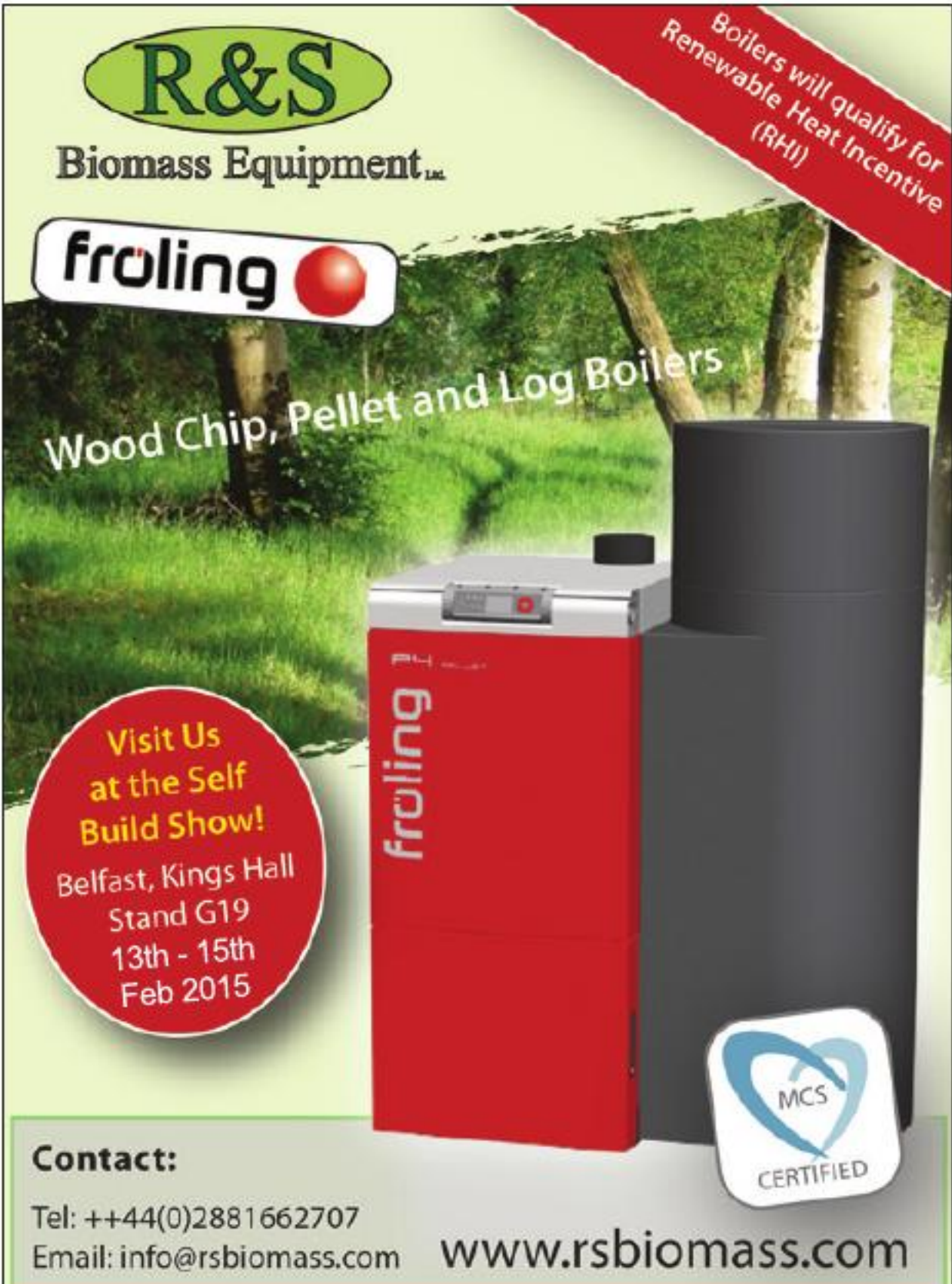
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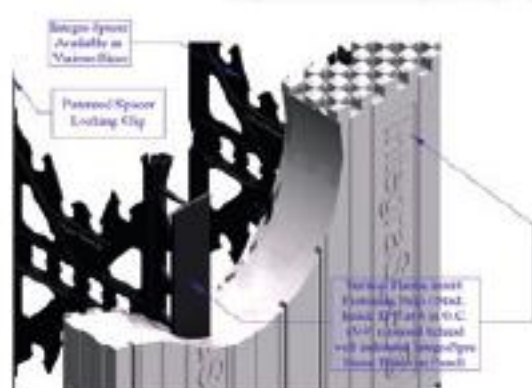
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Fuel for thought

Energy and the environment go together like tea and toast or peaches and cream. The difference is that with the food pairings it is possible to have one without the other.

But our needs for energy (normally meaning burning fuel of some sort), and the subsequent effect on our environment (particularly air quality both indoors and outdoors), are much more closely intertwined. They are like two dancers caught up in an eternal waltz.

Humans first exploited the properties of fire as a heating, cooking and lighting source one million or more years ago. At a later point, the campfire was brought inside their caves and self-build huts where the accepted arrangement became a central fire built under a roof opening to allow the choking smoke to escape. A variety of approaches over subsequent centuries were tried to improve the draught of the fire. However, even the best open fire that could be made was only around 20% efficient because most of the heat escaped through the ventilation hole in the roof, necessary to prevent suffocation of the inhabitants. The Ancient Romans took other, cleaner, approaches, using underfloor heating systems in their villas, and used solar radiation to warm their bath-houses through south-facing windows. Elsewhere by the 800s stone fireplaces with a short flue to the outside for more efficient smoke removal appeared, followed by metal stoves in the 17th century using primarily wood or coal as fuel. By the late 18th century in Ireland, peat was the dominant fuel. It soon became plain that coal generated large amounts of materials which blackened rooms and could attack furnishings; the culprits were, and still are, soot and sulfur dioxide, which have adverse health consequences as well. The French unknowingly got around the problem with the invention of a so-called 'smokeless stove', in the late 1600s. It was one of the first environmentally-friendly advances made by us because it co-located the fresh fuel with the combustion effluent and, by so doing, directed all combustion products over the fuel that was already burning. This arrangement ensured complete combustion and much cleaner indoor air resulted. The use of oil and bottled or natural gas as heating fuels is a much more recent innovation because they are not as simple to burn in the house as throwing a log



onto a fire.

And that is the heart of the indoor and outdoor air quality problems we face because our mind-sets have been conditioned by the past to favour the burning of solid fuels over liquids and gases.

Who cares? We have known for many years that carcinogenic chemicals and much smaller particulate matter (PM) than soot are produced by the combustion of fossil fuels. The small solids, termed PM2.5, (that is a particle 2.5 microns in size), are invisible to the naked eye but can kill with long-term exposure. PM is a complex mixture of extremely small particles and liquid droplets that is made up of a number of chemical components including acids (like sulfuric and nitric), organic compounds (some carcinogenic), elemental carbon (soot) and metals (like lead). So you can see the materials involved are mainly quite toxic. Size matters too as the particles can become deposited into the larger (tracheobronchial) branches of our lungs where the effects on at-risk people (children, pregnant mothers, asthmatics and those suffering from cardiovascular problems), can be severe, especially over long exposure times.

In response to this problem WHO (World Health Organization) have recently published two new sets of guidelines. The first is on indoor air quality related to household fuel

combustion and the second on lower limiting values for PM2.5 exposure, which are considerably below those operating currently in the EU. They focus on the inefficient burning of solid fuels in households as being an important contributor to the 482,000 deaths counted in the European Region during 2012 directly related to air pollution.

On its own initiative Ireland has introduced a 'smoky (bituminous) coal' ban in many cities and towns and as a result of consultations with the public, a North-South Study was set up in 2012 to provide advice on the burning of solid fuel in Ireland and its environmental consequences. This report is likely to recommend a total ban throughout the island of Ireland, in part, because of smoky coal's high PM2.5 emission levels (4.3 kg/1000 kg burnt) compared to home heating oil (0.1 kg/1000 kg burnt) and gas (0.0/1000 kg burnt). The levels are even higher for peat (4.5 kg/1000 kg burnt) and (9.0 kg/1000 kg burnt) wood. Note that the second figure is twice as high as that measured for smoky coal. However, wood does have one advantage: it's the closest to being carbon neutral.

What to do? Try to avoid using an open fireplace. Whilst the burning of any form of carbon-based fossil fuel will lead to global warming by producing carbon dioxide, if you do have to then use a gas over a liquid over a solid. If you are building a new house or upgrading an existing one, from a health and environmental perspective we should learn from the Ancient Romans and the French: (i) Use radiant panels powered by solar energy. Advances in technology are continually bringing the cost of these down. (ii) Burn the most sustainable fuel (that is dried wood), but do so only in a modern, closed, very high-temperature combustion stove coupled with a heat-recovery-ventilation system. And plant a few trees in your new garden to take up the carbon dioxide that you release by burning fossil fuels! ■

Professor John Sodeau; crac.ucc.ie; @johnsodeau
Director of Centre for Research into Atmospheric Chemistry (CRACLab) Environmental Research Institute, University College Cork
<http://www.who.int/indoorair/guidelines/hhfc/en/>
<http://www.who.int/mediacentre/factsheets/fs313/en/>

Paving the way



PAVING AND WALLING manufacturer **Tobermore** have added a new colour, 'Harvest Gold', to their Historic Flag range. Tobermore's Historic Flag embodies traditional, vintage charm. The flag has a durable natural stone surface while the fettled edges and riven face add a timeless elegance, making it ideal for both old and new properties. Harvest Gold can now be ordered as well as the existing colours of Bracken and Slate, and Historic Circle, which measures 2.24m in size, is also available with the Historic range.

Call Tobermore, Co L'derry on 7964 2411 or visit www.tobermore.co.uk for more information.

No pane no gain

IT'S A DILEMMA many self-builders and home improvers face: you want to let in light and enjoy the views but you know that heat loss through windows is a significant factor in the energy calculations. The good news is you can have your cake and eat it, with an **Internorm** window. With U values as low as 0.63W/m²K and three gaskets as standard for airtightness,

Europe's largest window brand is now available from **J&N Windows & Doors Ltd.** in aluclad, uPVC and uPVC aluclad in both double and passive certified triple glazing. These attractive windows are available in a range of styles from traditional to contemporary and include large lift and slide doors and glass to glass corners; there's a product to suit every style and situation. Designed and manufactured in Austria to the highest standards and with an extensive manufacturer's warranty, all products are fitted by J & N's own experienced fitters, fully trained by Internorm. With a new 1,500sqft showroom in Fermanagh, which is just over 1.5 hour's drive from Belfast and Dublin and 2.5 hours from Galway, the company is extremely well placed to service orders throughout Ireland. Delivery is 6 - 8 weeks from the point of order and the showroom is open by appointment from 8am - 9.00pm 7 days a week.

Call in to see them at **J&N Windows and Doors Ltd, Unit 1, Kinawley Business Park, Kinawley, Co Fermanagh BT92 4FH. Tel. 6634 8186 - web: www.jandnwindows.com**



James Martin, Managing Director and Niall Smyth, Business Development Manager.

noticeboard

Cloud 9?

THE FIRM OF NICKELL & RICHMOND, based in Bangor, Co Down, are hoping they are rocketed to the earthly equivalent at the Park Plaza Westminster Bridge Hotel on the 18 February. Why? Because they are the NI regional winners

of the Heavenly Builder of the Year category at the Master Builder of the Year awards, run by the **Federation of Master Builders (FMB)**. These awards are unique because all of the entrants are nominated by satisfied clients and are therefore not only extremely well earned but also very valuable, as everyone knows how important word of mouth recommendation is, especially in the construction industry. The six other category winners going forward to the finals in London are: Forthill Builders, Cookstown (New Home and Kitchen); Moffitt & Robinson, Omagh (Bathroom and Energy Efficiency Project); MG Developments, Ballymena (Small Renovation

Project); Alskea Contracts, Dungannon (Large Renovation Project) Lowry Bros, Castlederg (Commercial Project) and Martin McLaughlin (Apprentice of the Year). Martin currently attends the North West Regional College studying wall and floor tiling and is a member of Squad UK who aim to represent the UK at the 2015 World Skills in Sao Paulo, Brazil. The winner of the overall Master Builder of the Year title will drive away in the top prize of a brand new commercial vehicle, while the clients who nominated them win a fantastic £3,000 prize. Good luck to all concerned!

Federation of Master Builders, Unit 10, Plasketts Business Centre, Kilbegs Road, Antrim BT41 4LY tel. 9446 0416 www.fmb.org.uk



Forthill Builders Kitchen
www.fmb.org.uk

Selfbuild BELFAST



Camden had the opportunity to showcase their innovative range of products and profile system at this year's **SelfBuild & Improve Your Home Show** earlier this year. A vast range of products were on display including Vertical Sliders, triple glazed Tilt & Turns, Composite Coors and their brand new Stable Door.

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