Towards the Zero Carbon Housing – part 1

Professor GÖKAY DEVECI RIBA FRSA, Robert Gordon University

‘Theory without practice is barren, and practice without theory is blind’
Cappadocia
CHALLENGE 1

Our house buildings are cliché!

Is this what we leave behind for the next generation?

Couldn’t they be more sustainable, stylish and humane places to live?
3 NEW SHOWHOMES FREE CARPETS OR 100% PART EXCHANGE
CHALLENGE 2

‘British homes pump out a quarter of the country's greenhouse gas emissions so making housing energy efficient is a massive challenge. The volume house builders who construct most UK homes will only adopt energy efficiency when they are engaged in public sector work and will refuse to sign up to it unless forced to.
Wall insulation thickness in Europe (status 1999)
STUNNING HOMES. FANTASTIC LOCATIONS.
MORE GREAT REASONS TO MOVE.

LEATHEN FIELDS, PORTLETHEN
3 AND 4 BEDROOM SEMI DETACHED AND DETACHED HOMES FROM £322,995
• Spacious lounge • Family area • Fully fitted kitchen with French doors • Garden • Light and airy front rooms • Master bedroom with built in wardrobes and en-suite bathroom • Family bathroom • Detached gardens • Ready to move in by June.

NEW FEATURES:
• Landscaped front and rear gardens • Fully fitted kitchens • Fully tiled bathrooms • Fully fitted bathrooms • Integrated appliances • Security system • 10 year warranty • Peace of mind

WELLIDE BRAE, KINNAY
3 AND 4 BEDROOM SEMI DETACHED AND DETACHED HOMES FROM £357,995
• Spacious lounge • Fully fitted kitchen with French doors • Garden • Light and airy front rooms • Master bedroom with built in wardrobes and en-suite bathroom • Family bathroom • Detached gardens • Ready to move in by June.

ENERGY EFFICIENT HOMES:
• Energy efficient design with double glazed windows • Under floor, wall and roof insulation • Secure rear gardens with fencing and garden gate • 10 year warranty for peace of mind

BROADHATE, WESTHILL
2 TO 5 BEDROOM SEMI DETACHED AND DETACHED HOMES FROM £214,995
• Spacious lounge • Fully fitted kitchen with French doors to garden • Light and airy front rooms • Master bedroom with built in wardrobes and en-suite bathroom • Family bathroom • Detached gardens • Ready to move in by June.

BRAEHEAD, STONEHAVEN
STUNNING: 4 BEDROOM DETACHED SHOW HOME £337,995
• Energy efficient design with double glazed windows • Fully fitted bathrooms • Fully fitted kitchens • Fully fitted bathrooms • Integrated appliances • Security system • 10 year warranty • Peace of mind

FURTHER DETAILS AVAILABLE IN ARDMORE, ELLON, KIRKING, STONEHAVEN, BRAWGOWAN, CARNIS, CRAIG, DUNFREMLING, DUNDEE, DURIE.

0845 074 3464 stewartmilnehomes.com

NOTES: Please note that all prices are subject to change and availability. Terms and conditions apply. Please see leaflet.

STEWART MILNE HOMES
The ‘Van Midden House | Aberdeenshire (1998)
A house without heating is most people’s idea of hell. That such a place might be built just outside Aberdeen seems like an act of madness. But that is precisely what architect Gökay Deveci designed and, after their first Christmas without heating, his clients seem delighted with their new home.

“We have been in for a few weeks now and I am very impressed,” says Dave Roberts, who moved in with his wife and three children in December. “It has not quite been possible to test all the heat-saving possibilities because there are some aspects of the house that are not yet finished.”

“In the first house I used recycled newspaper insulation at a depth of 200 and 300mm,” he explains. “Seeing how well this worked, I started to think about what would happen if I radically increased the thickness of insulation, the more we put in, the more we recovered. I would say that there was a 50% reduction in energy use.”

According to Deveci’s calculations, savings of about £300 each year should be possible. An independent study will monitor the house and report on energy use during the first year.
Room with a phew!

ONE NIGHT OF PASSION CAN HEAT THIS HOUSE FOR DAYS

RANDY residents of a space age Scots home will be able to heat their house for free — by BONKING.

EXCLUSIVE

BY KEN ADAMS

which is then heated by light before circulating around the building.

Randolph residents — made from old YELLOW PAGES — heats the
A'Chrannag (1994). Social Housing Rothesay, Isle of Bute
1. 20mm Sto-Render / Wet Dash
2. Triple Glazed Windows with Argon/Low-E
3. 25mm Marine plywood ingoes
4. 100mm Conc Block
5. 300mm thk Dritherm Insulation
6. Ancon 300mm Cavity Two-Part S/S Ties
7. 100mm / 140mm Conc Block
8. 45mm Service Void
9. 12.5mm Plasterboard
Model ‘D’ House - Affordable Rural Passivhaus (2011), Aberdeenshire
Model ‘D’ House | Aberdeenshire

External Wall Specification:
U-Value – 0.12 W/m2K

1. 12.5mm Foil Backed Plasterboard
2. 300mm o/a Scottish Spruce timber frame
3. 500 gauge polythene to provide air tight construction
4. 300mm o/a Wool insulation
5. 10mm open joint Scottish Larch horizontal timber cladding
6. Triple Glazed timber windows
7. Aluminium cill
8. 18mm thk Scottish Oak timber cill
9. 9. 10mm Shadow gap bead
Is the timetable for level 6 achievable?
Lighthouse - Code 6 homes. (zero Carbon) Costs: 900K
Passivhaus Standards

Practical Definition:
An internationally established building standard with very low energy consumption; which has been proven in practice
# A Definition of the Passivhaus Standard

<table>
<thead>
<tr>
<th>Primary Energy</th>
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<th>120 kWh/m²yr *</th>
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<tbody>
<tr>
<td>Heating</td>
<td>20°C air temperature</td>
<td>15 kWh/m²K</td>
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<tr>
<td>Air-tightness</td>
<td>Drafts &lt; 0.15 m/s</td>
<td>0.6 ach @ 50 Pa</td>
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<td></td>
<td>Stratified air &lt; 2°C head/foot</td>
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<tr>
<td>Surface temp (windows)</td>
<td>Radiant comfort</td>
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<tr>
<td></td>
<td>Downdrafts</td>
<td>&gt;17°C</td>
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<td></td>
<td></td>
<td>&lt; 0.15 m/s</td>
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<tr>
<td>Overheating</td>
<td>&lt;25°C</td>
<td>Max 10% (5%)</td>
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<tr>
<td>Air quality</td>
<td>Ventilation, pollutants</td>
<td>0.3-0.4 ach/hr</td>
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<tr>
<td></td>
<td>(humidity, carbon dioxide,</td>
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<td></td>
<td>VOC’s)</td>
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<tr>
<td>Acoustics</td>
<td>Noise disturbance</td>
<td>&lt; 25 dB(A)</td>
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<td></td>
<td>between spaces</td>
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<td></td>
<td>Sound pressure level</td>
<td>&lt; 35 dB(A)</td>
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<td>in plant area</td>
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