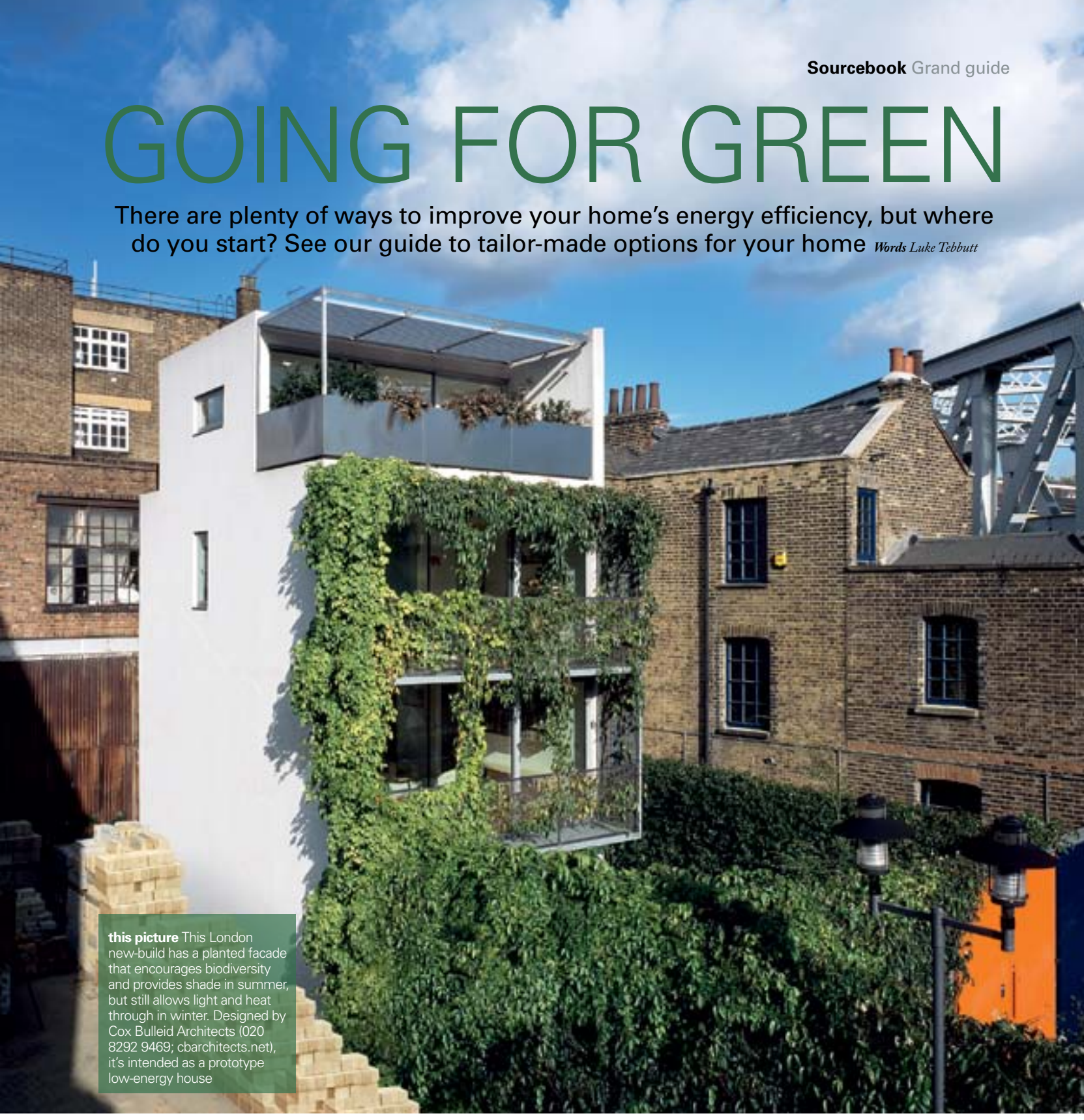
GOING FOR GREEN

There are plenty of ways to improve your home's energy efficiency, but where do you start? See our guide to tailor-made options for your home *Words Luke Tebbutt*



this picture This London new-build has a planted facade that encourages biodiversity and provides shade in summer, but still allows light and heat through in winter. Designed by Cox Bulleid Architects (020 8292 9469; cbarchitects.net), it's intended as a prototype low-energy house

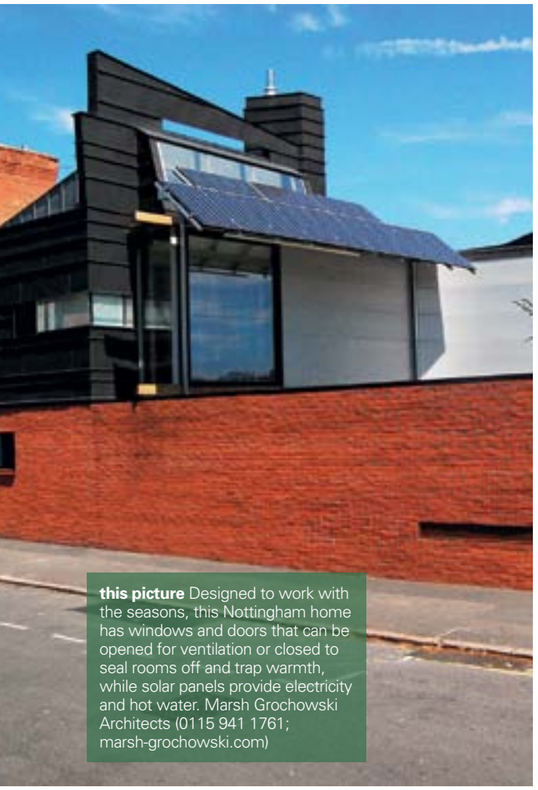
Hélène Binet

Britain's homes are responsible for a quarter of the country's carbon emissions, and in three years' time, the Government wants all new-builds to be rated as zero carbon. As a result, there's a mass of energy-efficiency information and financial incentives, all designed to help homeowners bring their properties up to scratch. Whether you're upgrading a old heat-leaking house, or designing a super-efficient property for the future, there are small and large steps to take you towards the zero-emissions goal.

EFFICIENCY ON A BUDGET

The good news if your eco funds are limited is that a little can go a long way. 'Draughtproofing windows, using low-energy light bulbs and buying energy-efficient appliances are easy wins,' explains architect James Wright (020 7249 0791; macdonaldwright.com), who dramatically reduced the running costs of his Victorian terrace when he refurbished it, taking its Energy Performance Certificate rating from an F to a B.

'You can make a pretty big impact with £2,000,' says →



this picture Designed to work with the seasons, this Nottingham home has windows and doors that can be opened for ventilation or closed to seal rooms off and trap warmth, while solar panels provide electricity and hot water. Marsh Grochowski Architects (0115 941 1761; marsh-grochowski.com)

this picture Clad in local larch and recycled slate, this new-build in Powys, Wales, by Feilden Fowles (020 7033 4594; feildenfowles.co.uk) uses passive design principles, facing south to catch heat and light from the sun

Russell Smith, managing director of green refurb company Parity Projects (020 8874 6433; parityprojects.com). 'Simple things, such as adjusting your thermostat, can make a difference.'

The Energy Saving Trust (0300 123 1234; energysaving trust.org.uk) is rich with simple tips, such as turning your room thermostat down one degree (save £65 a year), replacing an old gas boiler with an A-rated condensing boiler and improving your heating controls (save up to £310 a year).

RENOVATING AN OLD PROPERTY

Adequate insulation is key if you want to make a significant dent in your old home's energy needs. Start with your loft (warm air rises, so around a quarter of your home's heat can be lost here) then look at the floor and walls.

According to the National Insulation Association (0845 163 6363; nia-uk.org/householder), a third of UK homes have solid walls and 45 per cent of heat escapes through them. Internal insulation will cost roughly £8,000 for an average home, says Russell Smith from Parity Projects, while external insulation will set you back around £12,000.

It's worth investing in some expert advice before you start. 'An impartial consultant will assess your home and how you use it, discuss the options and give you an idea of the costs involved and potential savings,' says Smith. Find a consultant in your area through the Association for Environment Conscious Building (0845 456 9773; aecb.net) and make sure you look at the Government's Green Deal scheme (gov.uk/greendeal), which lets homeowners install energy-saving measures and pay for them later through savings on bills, as long as the projected savings are more than the initial cost.

IF YOU LIVE IN A FLAT

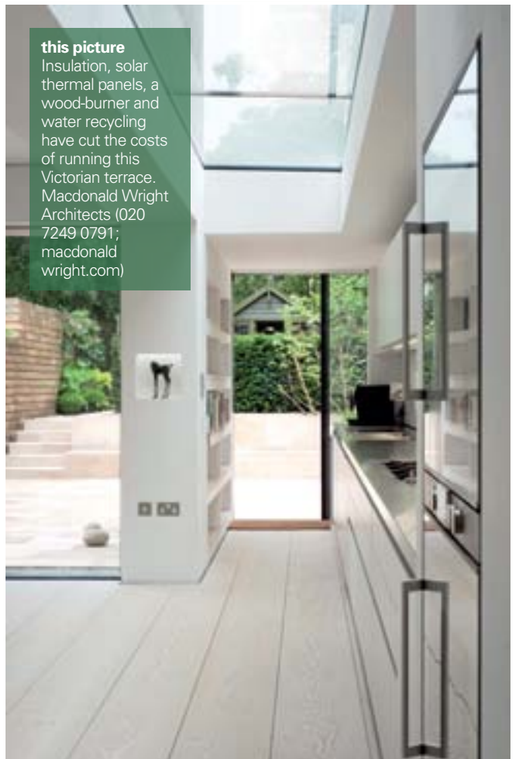
You will need the freeholder's permission for intrusive work to a flat, such as adding new insulation, and its impact will be diminished unless the whole building follows suit. On the plus side, living close to other homes keeps yours warmer, and improvements such as draughtproofing, or adding secondary or double glazing, will make a more noticeable difference, as will lifestyle changes.

'Switch to low-energy light bulbs, turn appliances off instead of leaving them on standby, and buy A+ rated appliances when you need them,' says James Wright. 'And get an energy meter so you can see what you use and work at reducing that.'

NEW-BUILD HOMES

The Government wants all new homes to be zero carbon by 2016, and is making changes to Building Regulations to achieve this. The latest, to Part L (which governs energy efficiency), will be introduced in April next year, with a target of making new-builds six per cent more efficient than they are now.

For grand designers, there are two main routes towards the ambitious zero-carbon target. The first is the Government's →



this picture Insulation, solar thermal panels, a wood-burner and water recycling have cut the costs of running this Victorian terrace. Macdonald Wright Architects (020 7249 0791; macdonald wright.com)

CASE STUDY

'I wanted to do a zero-carbon retrofit because it had never been done before'

Architect John Christophers refurbished and extended his Victorian semi-detached house in Birmingham to meet level 6 (the top level) of the Government's Code for Sustainable Homes. His home produces more energy than it uses, thanks to renewable technologies – a 5kW array of photovoltaic panels for electricity, plus solar thermal panels and a wood-burning stove for hot water and heating. It also incorporates elements of passive house design; the building is wrapped in insulation to make it airtight, and has heat-recovery ventilation to keep the air fresh. As a result, John saves about £1,500 on bills each year, and earns £1,650 from the Feed-in Tariff for the electricity he generates. For more information, and to find out when the next open day is, visit zerocarbonhousebirmingham.org.uk.

David Grandorge; Martine Hamilton Knight; Rogan Macdonald; Hannah Marsh

Code for Sustainable Homes (planningportal.gov.uk/building regulations), which takes a holistic approach, covering nine key areas, such as energy efficiency, how much water you use and even whether you have bike storage.

The second is the Passivhaus standard (020 7704 3502; passivhaustrust.org.uk) – a benchmark for homes that achieve a comfortable year-round temperature, requiring little heating, cooling or energy. This is achieved by wrapping the house in insulation and high-performance glazing to make it airtight, and installing heat-recovery ventilation to provide fresh air. It has a reliable track record (around 30,000 passive houses have been built worldwide), but will be harder and more costly to achieve if you want sprawling spaces or large expanses of glass.

RENEWABLE TECHNOLOGIES

Generating your own heat or electricity could slash your energy bills, and also be a nice little earner thanks to two Government incentives. The Feed-in Tariff (gov.uk/feed-in-tariffs) pays you a set rate for any electricity you generate at home (even if you use it yourself), as well as any electricity you export back to the grid, and the Renewable Heat Incentive (gov.uk/renewableheatincentive), due to be introduced next year, will pay you for any heat you produce.

An average solar photovoltaic system (3.5 to 4kWp) will cost around £7,000 and generate three quarters of a typical household's electricity, leaving you £645 better off each year thanks to savings on bills and money from the Feed-in Tariff. And a 6kW pole-mounted wind turbine will cost about £22,500 and generate 10,000kWh of electricity a year in a good location – more than enough for an average home.

For heat, your main options are solar thermal panels (about £4,800 for a typical system, providing most of your hot water in summer, but less in winter); an air source or ground source heat pump (good for replacing an electricity- or coal-based system, but not so cost-effective when replacing gas); or a wood-fuelled system, such as a pellet boiler (about £11,500 for a typical home, saving about £630 a year if you are replacing electric heating, but just £90 if you are replacing gas).

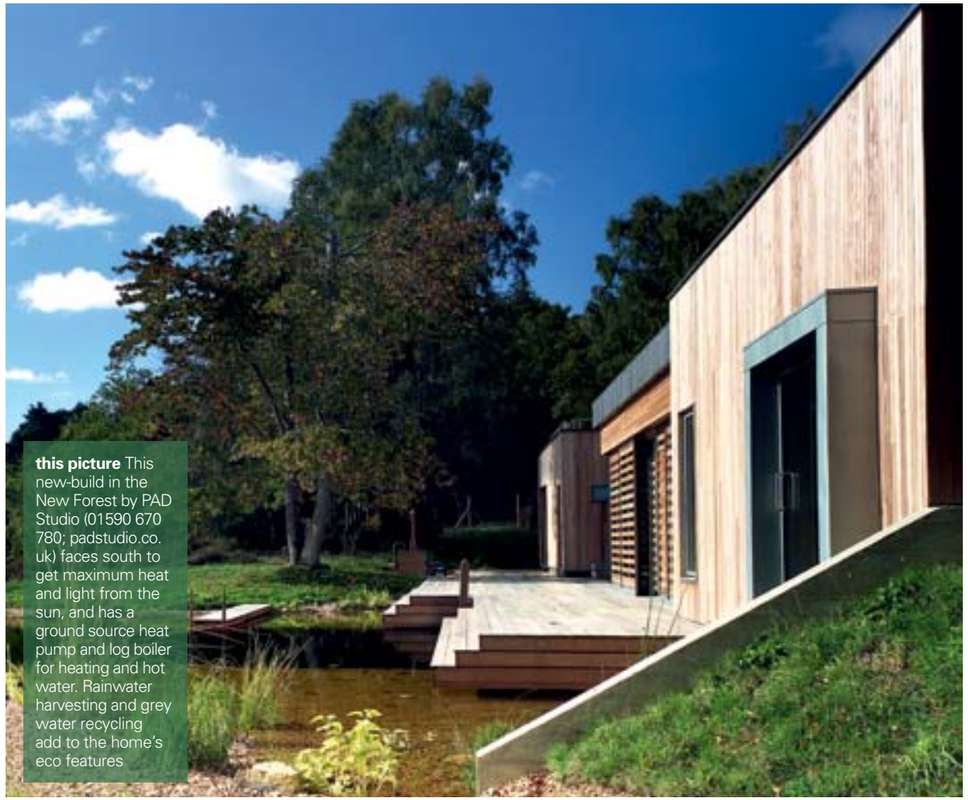
Figures above are from the Energy Saving Trust which has lots more information on going green. GD

this picture Formerly an unremarkable Sixties property, this home now meets level 5 of the Code for Sustainable Homes. BBM Architects (01273 400 319; bbm-architects.co.uk) transformed it with external insulation, solar thermal panels, high-performance double glazing and a wood-fuelled boiler, and completed the refurb with locally sourced sweet chestnut cladding

CASE STUDY

'Positioning the house to face south takes full advantage of light and heat from the sun'

Location can be a big help in creating an eco house, as this zero-carbon new-build in Hove, East Sussex shows. Mark Pellant from Koru Architects (01273 204 065; koruarchitects.co.uk) faced the house south-west to get maximum daylight and heat from the sun, and added solar thermal panels and a 4.2kW solar photovoltaic array to the roof. The photovoltaic panels provide all his electricity (and earn him £1,500 a year through the Feed-in Tariff), and the solar thermal panels provide all his hot water in summer, with a wood-pellet boiler as a back-up in the colder months. He also has a rainwater harvesting system that supplies water for flushing WCs, washing clothes and gardening.



this picture This new-build in the New Forest by PAD Studio (01590 670 780; padstudio.co.uk) faces south to get maximum heat and light from the sun, and has a ground source heat pump and log boiler for heating and hot water. Rainwater harvesting and grey water recycling add to the home's eco features

CASE STUDY

'Passivhaus standards are worth the effort'

Adam Dadeby of Passivhaus Homes (0345 257 1540; passivhaushomes.co.uk) achieved the seemingly unachievable when he refurbished and extended a down-at-heel Seventies home in Totnes, Devon, to meet the Passivhaus standard. As well as fitting top-to-toe insulation and high-performance glazing, he added solar thermal and photovoltaic panels for heating and electricity. His monthly gas bill is £16, and his monthly electricity bill is about £45, though the money he earns from the Feed-in Tariff pays for this. The house is also a B&B, so guests can experience life in a passive house (passivhausbandb.co.uk) and Adam has co-authored a book on the subject, *The Passivhaus Handbook* (£35, Green Books).

BBM Architects; Malcolm Baldwin; Alistair Nicholls; Nigel Rigden