

## Building Sustainable New Homes



### about the author ...

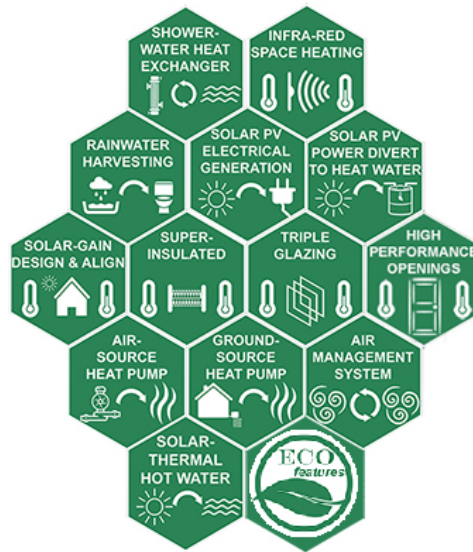
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### taking a triple bottom-line approach ...

Customer-responsive regional housebuilders have got their heads around this conundrum long ago, unlike their national shareholder-driven counterparts. As far back as 2015, there are excellent examples of regional housebuilders designing and building new homes that required no central heating (big cost-saving there!) and cost as little as £1 per day at the time to meet the space and water heating requirements. That same developer's latest homes now regularly use an array of the environmental technologies illustrated by the icons opposite.

### sustainability: now a major selling point for new homes ...

With COP-26 still fresh in the public's mind, and rapidly growing energy bills even more in focus, the practical impacts of climate change are now also becoming clearer with consumers who are increasingly starting to ask the right questions in relation to the sustainability of the goods and services they buy. Nowhere does this apply more sharply than in the new homes market.



As with most things environmental, a "triple bottom-line" approach to house design and build decisions needs to be taken when developing new homes to higher environmental standards. At every stage of the design and build process, decisions need to be taken not solely from a financial perspective, but from the perspectives of what is good for the home-owner, what is also good for the environment, and also good for the financial success of the builder.

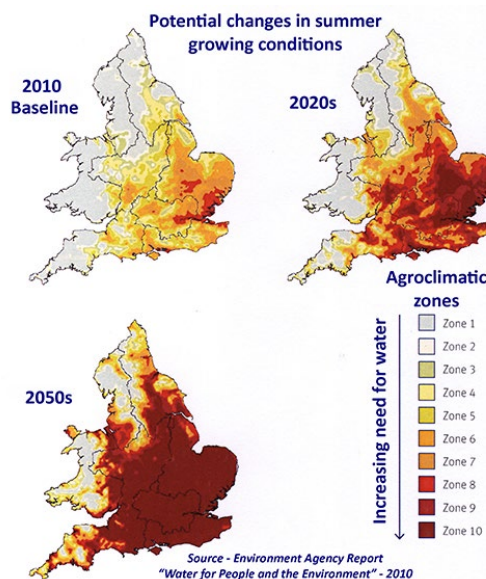
For years the mainstream house-building giants have been resisting all efforts to raise the build-standards of their new homes, a battle which they are destined to lose given the impact on living standards of rising energy costs. If Government legislation for much higher energy-efficiency in new homes doesn't force the industry's hand soon, then we can be sure that buyer-demand will.

This is a view supported by a recent Home Builders Federation survey undertaken before the ongoing hike in energy prices, where 73% of respondents stated that they are worried about the energy performance of their current home, and 24% saying that energy performance would be crucial to their next home-buying decision. So what can house builders do about it, and how will it affect their finances?

Some of the changes to the environmental build standards of new homes are likely to flow from a

### climate-change impacts ...

DEFRA consultation currently underway. For the first time, this is taking an across the board look at the climate change impacts on the environment, with the aim of Government setting targets for managing those impacts. Once the targets are set, practical actions to deliver those targets will then follow.



A good example of the approach being taken concerns the management of public water supplies, the availability of which is under the dual-threat of a growing population and diminishing supplies due to climate change; this latter aspect is well illustrated by the changes to growing conditions

already being experienced by farmers, particularly throughout England south of the Humber estuary.

According to the DEFRA consultation, as the population grows, the threat to public water supplies needs to be tackled by a range of measures including by reducing the daily water consumption per capita from its current level of around 150-litres down to 110-litres.

### **practical delivery constraints ...**

Once Government agrees a new target consumption level along these lines, it will need to move on to practical implementation measures, which will include reducing leakage rates. As it will not be easy to change the mains water actually consumed daily by the existing housing stock, it can be reasonable assumed that new homes will need to carry the lion's share of the savings that need to be made by households.

Current Building Regulations require new homes to be designed and built so that they use no more mains-water than an average of 125-litres per person per day; generally, this can be achieved by a combination of water-efficient appliances, smaller baths and wash-hand basins/sinks, and water-efficient taps and shower-heads. To reduce average daily consumption significantly below the current requirements might potentially involve more stringent limitations on water-use, such as showers-only homes, measures unlikely to be universally popular with all buyers.

However, of the potable water delivered to a home through public water supplies, around 50% is "wasted" on non-potable applications such as toilet-flushing and clothes washing machines. This 50% can as easily be provided by well-established water re-use technologies such as rainwater harvesting and greywater recycling. Using either of these technologies in a new home would be likely to bring mains water consumption in the property down to less than 80-litres per person per day, thus making a major contribution to the national 110-litres average target, whilst avoiding the need for more stringent usage limitations by other means.

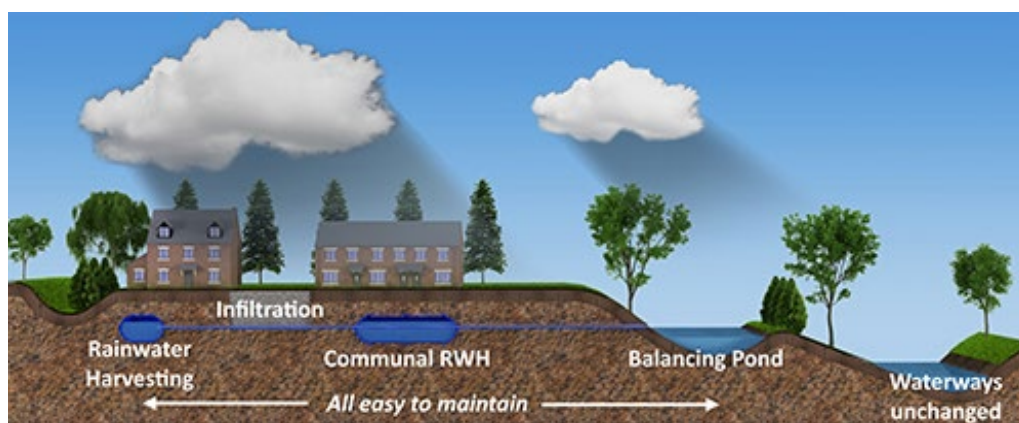
### **water re-use systems...**

Rainwater harvesting systems are simple to install when a house is either being built or refurbished. The water falling on the roof, which would otherwise be channelled to soakaways or the storm-drain, is diverted instead to an underground storage tank used exclusively to supply toilet cisterns, clothes washing machines and outside taps. These are served via

separate non-potable pipework, with systems sized to match their collection potential. This is largely dictated by roof area, and occupancy, the latter determining how much non-potable water is likely to be used. Larger detached houses might typically have their own independent system, whereas smaller terraced homes might share a larger communal system.

Where there is a mismatch between available collection roof area and the occupants' potential demand for non-potable water, in a high-rise development for example, then a greywater recycle system might be preferred. These collect and cleanse bath and shower water for non-potable re-use, there generally being an excellent match between the water used for bathing and needed for toilet-flushing.

Both systems are designed to work completely automatically, and include arrangements to ensure that there is always a supply of water to the non-potable services, irrespective of rainfall or bath-usage.



### **cost vs benefits...**

If that all sounds like more cost, and a reduced margin, then that is where triple bottom line thinking enters the equation. As a straightforward "add-on", then water re-use is an added cost. However, taking rainwater harvesting as an example, if it is included in the overall development design from the outset, and is fully integrated with the site sustainable drainage requirements as illustrated, then a cost vs benefits balance results.

Moreover if, in a water-stressed area, the inclusion of water re-use makes the difference in obtaining planning permissions, then the benefit swings sharply in favour of water re-use. Better still from an environmental perspective, a recent study

commissioned by *Waterwise* concluded that re-use systems such as rainwater harvesting also lowers the carbon footprint of overall water usage.



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