# Towards a Green Economy

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A big question that the world has to answer: will sustainability stay at the forefront of our minds with the world facing a serious economic recession?

Not long ago the headlines were focused on climate change, but now they are obsessed only with the deteriorating economic climate. Reports about global warming and melting polar ice-caps have been replaced by stories of the latest bank or retail giant to fall victim to the credit-crunch. People have started to look closely at their energy bills not to check their consumption but to worry about the rising costs…but perhaps there is some salvation in linking those two issues?

Does all this mean that the environment is no longer the key issue affecting our modern lives? Have we forgotten about the needs of our planet? Are we now so absorbed in worrying about economic doom that we have begun to ignore environmental issues?

Well, maybe the recession can help the planet. Reports from the UK and across the world show that we are being more careful with our hard-earned money – we're buying less and we're buying smarter. So tightening our wallets and purses may be cutting our carbon footprint.

So this is great news for the environment. We are all doing less of the things that are really damaging and doing more of the things that are greener and healthier. Is this all we need to do – a bit less, a bit slower? There is clearly some potential for the recession to change the way we live, making us greener, healthier and maybe ultimately happier. But I think tackling climate change effectively will demand a little more from us.

Moving towards a green economy can help us to both meet the environmental challenges that we face and tackle the effects of the economic recession. If we embrace the environmental agenda wholeheartedly then it's possible that many, many jobs can be created from the measures that we have to take.

The United Nations Environment Programme has produced what they describe as a 'landmark report', "Green jobs: towards decent work in a sustainable, low carbon world" . From an investment perspective, refocusing the economy from a model established in the early part of the 20th century into one based on clean technologies - like renewable energy regeneration, 'natural infrastructure' such as forests and, of course, building more energy efficient homes – is the essential foundation to revitalizing the world's economy. And if this can be achieved it will also have helped to steer the


economy in a more sustainable direction.

According to Achim Steiner, UNEP's Executive Director, "The financial, fuel and food crises of 2008 are in part a result of speculation and a failure of governments to intelligently manage and focus markets." He went on to say that "…they are also part of a wider market failure triggering ever deeper and disturbing losses of natural capital and nature-based assets coupled with an over-reliance on finite, often subsidized fossil fuels."

Has the housing sector got a part to play? Steiner also said: "The flip side of the coin is the enormous economic, social and environmental benefits likely to arise from combating climate change and re-investing in natural infrastructure – benefits ranging from new green jobs in clean technology and clean energy businesses up to ones in sustainable agriculture and conservation-based enterprises."

So it seems that the economic models of the 20th century have run their course. Is it possible to continue with old methods that have failed us when we have challenges like delivering better livelihoods for the 2.6 billion people still trying to live on less than $2 a day? Is it possible that those models can help us reduce our ecological footprint? When the global economy recovers, investments will start to return to high levels. Is it acceptable that they go into the old short-term economy? Or should we not be demanding that resources go into a new green economy that will deal with a variety of challenges and at the same time generate many new economic opportunities for the poor and well-off alike?

There is a huge global market for products and services according to the UNEP report. It's estimated at US$1.4 trillion (47.2 trillion TWD) at present and is projected to almost double by 2020. Some 50% of the market is related to energy efficiency with the rest linked to sustainable transport, water supply, sanitation and waste management.

Take Germany as an example, where environmental technology is forecast to grow from 4% of its industrial output today to 16% by 2030, with employment in the sector exceeding their large machine tool and automotive industries.

So what does all this mean for the housing world? Well, amongst the key components for the green vision of a new economy are building and construction, incorporating energy efficient technologies and renewable energies. On a global scale the transition to energy efficient buildings could create millions of jobs while investments in improved energy efficiency in buildings could create an additional 2-3 million 'green' jobs in Europe and the USA alone.

To give the subject a UK focus, a report commissioned by the Federation of Master Builders (FMB) suggests there is a market for upgrading housing worth some £3.5 billion (173 TWD) for the country's builders. The report, "Building a Greener Britain" was compiled and released in 2008 by the Environmental Change Institute at Oxford University. The report's author, Gavin Killip, says "Bringing British homes up to standard is possible using existing technology but the skills and industry base to deliver the necessary change is under-developed. Making low carbon housing mainstream will be good business and good for jobs, as well as reducing energy bills and CO2 emissions"

This call for Government to help to promote and develop a market that will not only maintain but create new jobs and business for the country's troubled construction industry is a clear example of the vision of opportunity described by UNEP. At CIH we believe the time is right for a massive structured programme with strict targets which deals with the existing housing stock in a strategic and comprehensive manner. We need investment levels that at least match those of past inner-city renewal programmes. The current 'piecemeal' approach does not address the scale of the programme and is not fit for purpose.

Investing in low or zero carbon housing makes sense in so many ways – a 'green'home:

- Creates a healthier indoor environment, with better health for residents
- Uses less energy
- Produces less waste
- Wastes less resources
- Reduces fuel bills helping people to better manage the cost of living

On a wider scale it helps to develop greater environmental awareness leading to increased responsibility and helps to create jobs. We can look to Germany for evidence, where it is estimated that for every £1 billion (49.3 billion TWD) invested in the existing housing stock, around 25,000 jobs are created (June, 2007).

The most widely known definition of sustainable development is "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs" . I'd like to look at some examples of recent housing projects that are contributing to this approach and showing that a greener economy is the right way.

I'll start with my own employer, **North Wales Housing Association**, as it's important to 'walk the talk' as we say. This is Parc Street in Holyhead, on the Isle of Anglesey. We took over the site of a derelict building which was being vandalized by young people and becoming dangerous. The development of eight homes won the 2007 Welsh Housing Award for 'Increasing Environmental Sustainability'.

The eight houses achieve high levels of sustainability through a range of features:

- Internal timber frame construction with high insulation levels
- Internal lighting is 100% energy saving, included the boarded out loft space
- Solar water heating systems using the largest panels available to maximize the south facing aspect
- Condensing boilers increase efficiency
- Water harvesting systems designed to lower the use of mains water.

For the first three months the average electricity bill for residents was £9 (44 TWD) and we will continue to monitor performance on behalf of residents.

In November the **Welsh Assembly Government** took a positive step, announcing that more than 40 leading organisations representing the construction sector in Wales had teamed up to sign the first green building charter of its kind in the UK. They are committing themselves to support progress towards the development of low / zero carbon buildings ahead of the UK Government's target of achieving zero carbon new homes by 2016 and achieve a major step change in Wales by 2011. It will also work towards significantly increasing the energy efficiency of the existing building stock in Wales, contributing towards a target of 3% annual reductions in emissions from 2011 onwards.

Reductions of 3% each year would enable Wales to achieve an 80% reduction before 2050. One method

of reducing Wales' carbon footprint is through improving the energy efficiency of buildings, as the direct and indirect consumption of energy from buildings generates approximately 40% of all carbon emissions in the UK. By achieving these targets, there must be an increase in green jobs and the expenditure required over a relatively short timescale means a boost to the economy.

If that's at the level of government, what can individual organisations do? The **Gentoo Group** in the north east of England is amongst the most progressive of our housing associations and adopted a CO2 Charter in 2007. This commits them to:

- Challenge environmental laziness
- Use sustainable materials whenever possible
- Maximize recycling opportunities
- Eliminate unnecessary transportation
- Encourage their customers to be environmentally responsible and energy efficient
- Make recycling simpler for their staff and customers
- Challenge negativity and encourage positive behaviour
- Work with their partners to influence their behaviour in support of their work.

Gentoo, named in The Sunday Times Top 50 Best Green Companies List, commissioned environmental accounting experts to carry out a comprehensive footprint assessment of its entire business as part of its ongoing work to improve the efficiency of the Group and reduce its impact on the environment. Gentoo has created a specialist division called Gentoo Green, to ensure delivery of Environmental Sustainability across the business.

Gentoo manages around 30,000 housing units for approximately 70,000 thousand residents, which means they can have a substantial direct and indirect impact on carbon savings through policy changes and awareness programmes. For some time Gentoo has been offering a personal footprint service to its staff and are now involving its customers through Its EASI (Environmental Awareness Sustainability Impact) campaign. Gentoo's office footprint for all their bases is just over 6,000 tonnes of CO2, over half from energy consumption and 24% equating to business travel.

It's clear that successful businesses develop by changing, and the drivers for sustainability create a new market environment where adapting businesses can thrive.

One way of promoting innovation and encouraging by example is through awards. Last year the UK held its first Sustainable Housing Awards. The winner of the best sustainable larger social housing project was the **Bromford Group** for its scheme in Cross Street South, Wolverhampton. They built 27 apartments and three four bedroom houses. Modern methods of construction and sound thermal mass meant that each home uses only two kilowatts of heat per hour – it's typically 8 to 10. What makes it outstanding is its biodiversity – an urban site now contains an eco-park for the local community with a balancing pond with fluctuating water levels, recycled walkways and lots of planting. It also includes allotments for residents to grow their own food. All materials can be recycled and are low maintenance whilst there is a green roof.

Heat is provided by a community biomass boiler fuelled by wood chip feeding through to underfloor heating. A heat recovery system provides mains pressure hot water. The scheme includes many water-saving measures too.

Of course, it's easier to achieve low carbon housing when building new homes but more difficult to achieve with existing homes. The **Sanford Housing Co-operative** in South London began by looking at their long-term maintenance issues and capitalized on the interest of their residents by sending them on a two-day course in environmental technology at the Centre for Alternative Technologies in Wales. They created the 'C60 Project' which aims to cut emissions by 60%. The houses were built in 1973. The improvements included:

- Replacing gas boilers with biomass boilers using wood pellets
- Solar thermal panels to provide hot water
- Exchange fans to reuse waste heat
- Low energy lighting
- Rainwater butts
- Eco kitchens
- A bicycle shed made from recycled materials and with a green roof.

Materials have a major part to play. This **Orwell Housing Association** scheme in Suffolk in England has no visible environmental add-ons and no fancy gadgets. The homes are grouped in blocks of three, angled north–south towards the sun. The environmental gain comes from the fabric and clever design. The timber-framed structure has been sprayed with a mix of lime and hemp – called hempcrete. It captures carbon dioxide, which makes it carbon negative. The walls are airtight with windows of various sizes punched in the wooden-clad façade to maximize the solar gain and give visual variety.

Construction has begun on the UK's first carbon-negative residential development. The Leeds **"greenhouse"**, led by developer **Citu**, will create 172 homes, office space and associated amenities. The development includes high-level insulation, ground source heat pumps, rooftop-mounted wind turbines and solar thermal, and a 100m offsite wind turbine.

All this will mean that the "greenhouse" will use

less energy than it creates, allowing the excess to be fed into the National Grid. This will make the development carbon negative. Developers say the innovations mean the "greenhouse" will save around 700 tonnes of carbon and 3.5 million litres of water per year compared with an equivalent conventional development. It will cut utility bills by up to one-third.

"Greenhouse" will provide 1,400m$^2$ of state-of-the-art office space, incorporating virtual networks, video conferencing, a wireless environment, high-speed broadband and business support services on-site. Additional features embrace a design-led approach to minimising environmental impacts. These include an electric car club scheme, a bicycle by-the-hour service, full on-site recycling facilities and allotments to grow your own food.

Many people in urban settings live in high-rise homes, particularly relevant in Taiwan and elsewhere in the Asian Pacific, and the high density means that this is a more efficient use of land. A Malaysian-based architect, **Ken Yeang**, is the leading designer of bioclimatic skyscrapers – high-rise buildings that drip with plants and are angled to catch the sun.

The Editt Towers in Singapore is planned to be built soon. It has half a square metre of planted area to each square metre of useable area, with plants chosen to avoid conflict with local indigenous species. Carbon embodied in the construction process has also been taken into account.

- Rainwater is collected on the roof and in sunshades
- Built-in filter systems re-use water, making the tower 55% self-sufficient
- Solar panels will cover 855 square metres of the structure
- A waste management system is built-in
- Sewage is treated to create compost or biogas.

For my final example I'm going to look at Sweden. In England the Government is looking to establish 10 new eco-towns. **Hammarby Sjostad** could provide the model we need. It is a settlement of 11,000 homes and is highly self-sufficient. In Hammarby they put waste from the sewage into the compost. They take out the heat from the sewage and bring it into the district heating system. Over 70% of the towns heating is based on renewable resources.

The biogas that is extracted from the wastewater treatment plant is primarily used to power buses and cars. It also powers around 1,000 gas stoves in Hammarby.

A strong transport infrastructure is important and, with the town being just outside Stockholm, most of its residents commute into the centre for work. Cars that use biogas do not have to pay the city's congestion charge and effective transport links mean that 79% of residents do not use cars to travel to work. Hammarby has been designed so that residents can walk from one side of the development to the other entirely on parkland and green spaces.

High density is key and the environmentally friendly performance has been achieved by building it into the system of the buildings rather than by relying on people.

In conclusion, we each have a personal responsibility to embrace the new agenda. If we are to succeed in achieving sustainability on a global scale, then a 'return to normal' is not an option once the world's economies start to recover. The potential for creating employment in a worthwhile and sustainable manner is enormous and the schemes that I've featured show the benefits of doing so. Our leadership in this area can be instrumental in increasing demand for the new technologies.

And if we in the housing sector are to successfully negotiate a path through the recession, it needs to be a sustainable path. Our governments in the UK are helping to tackle the downturn in the building industry by bringing forward money from future years' budgets to maintain building activity. But this is not enough. Let's try to solve our problems in a hopeful and optimistic way. We have a real opportunity to improve the homes we provide in a way that will create so many new jobs and at the same time contribute significantly to a sustainable world.

This paper is an abridged version of the speech Mr John Diggory delivered on the International Conference, Opportunities of Housing Management under Economic Recession, 27 February, 2009, Taipei, Taiwan. Mr Diggory has proofread this paper and gives his consent for its publication. His full paper appears on the website of CIH APB http://www.cih.org.hk/English/News/events_review_folder/events_review2009022701.html