

# TACKLING GLOBAL CLIMATE CHANGE MEETING LOCAL PRIORITIES

A WORLD GREEN  
BUILDING COUNCIL  
SPECIAL REPORT  
SEPTEMBER 2010



WORLD GREEN BUILDING COUNCIL

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Please visit [www.worldgbc.org](http://www.worldgbc.org) to learn more about the World Green Building Council and its member Councils from around the world.

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# THINK GLOBAL, ACT LOCAL

Foreword by Tony Arnel  
Chair, World Green Building Council

The need to 'think global, act local' has never been more urgent. Climate change is a threat that must be tackled globally, especially when considering that it is often those who are least responsible for the greenhouse gas (GHG) emissions that cause this phenomenon who are most likely to suffer the worst consequences. Further to this, it is the way we use energy in our homes and buildings – by definition locally – that offers the best and most cost-effective chance to mitigate the worst effects of climate change.

Currently, buildings use 32 per cent of the world's resources in construction. They are responsible for around 40 per cent of global energy use and generate up to 30 per cent of global GHG emissions.

At the same time, the United Nations Environment Programme (UNEP) has stated that "no other sector has such a high potential for drastic emission reductions"<sup>1</sup>, and the Intergovernmental Panel on Climate Change (IPCC) has identified that buildings offer some of the most cost effective and expedient ways to reduce GHG emissions.

The World Green Building Council agrees.

The global built environment can deliver rapid and cost-effective reductions to emissions and energy consumption – with a significant percentage realising positive returns to the global economy. Given that we are experiencing the worst global recession in living memory, with the built environment sector suffering the consequences the most, the importance of this

win-win opportunity to tackle global climate change and support economic recovery cannot be overstated.

But green buildings do more than deliver a smaller carbon footprint. Green buildings can help governments meet other priorities on their social and economic agendas, such as delivering affordable housing, creating new jobs and supporting local economies simultaneously.

This report, *Tackling Global Climate Change – Meeting Local Priorities*, provides an overview of what proactive government and private sector initiatives can do to harness the potential of green buildings to deliver important social, economic and environmental benefits for people around the world.

With COP16 in Mexico just weeks away, the World Green Building Council believes that a global approach to developing a low-carbon buildings solution is imperative if we are to effectively tackle climate change quickly and affordably. The work has already begun to demonstrate what is possible locally, all around the world. Those efforts need to be built into something that is more than the sum of their parts, to deliver solutions that will really make a difference globally.



Tony Arnel  
Chair, World Green Building Council



Tony Arnel Credit: WorldGBC

# FOREWORD

<sup>1</sup>UNEP, 2007 Assessment of policy instruments for reducing greenhouse gas emissions from buildings

# THE WORLD GREEN BUILDING COUNCIL: LEADING CHANGE

Jane Henley, Chief Executive Officer  
World Green Building Council



Jane Henley Credit: WorldGBC

## INTRODUCTION

As the largest international organization influencing the global green building market, WorldGBC is the collective voice of more than 20 established and 50 developing Green Building Councils in countries around the world. Together, we are committed to tackling the global challenges of climate change while also meeting a wide range of socio-economic local priorities – from affordable housing and energy security through to economic stimulus and job creation.

In this report, we have gathered a collection of examples from around the globe of how Green Building Councils (GBCs) and their members are helping to meet these challenges.

In this report you will notice that many countries are not able to comprehensively analyse and report the impact of their nation's built environment, including in some cases the GHG emissions. In researching this report, we have found that country statistics for the built environment are variable at best, and where they do exist, they are often hard to compare. This is one of the reasons why the WorldGBC, together with its partners, is committed to help overcome this issue by developing a 'Common Carbon Metric Protocol'.

Robust carbon accounting within the built environment is becoming increasingly urgent as policymakers seek to access abatement opportunities within the sector and leading property companies seek to quantify and achieve recognition for emissions reductions in the buildings they design, construct, own and operate. The building sector has enormous untapped potential for emissions reduction and presents the least cost abatement opportunity. But without common metrics to measure and report on building sector energy performance, it is difficult to accurately compare the carbon (equivalent) performance of buildings, let alone do so in a consistent manner that allows meaningful comparison or baseline establishment and target setting for emissions reduction.

In collaboration with the UNEP Sustainable Buildings & Climate Initiative (UNEP SBICI) and the Sustainable Building Alliance (SBA), a methodology to enable the global building sector to accurately and consistently measure and report its performance, to establish baselines and make meaningful comparisons is currently being piloted.

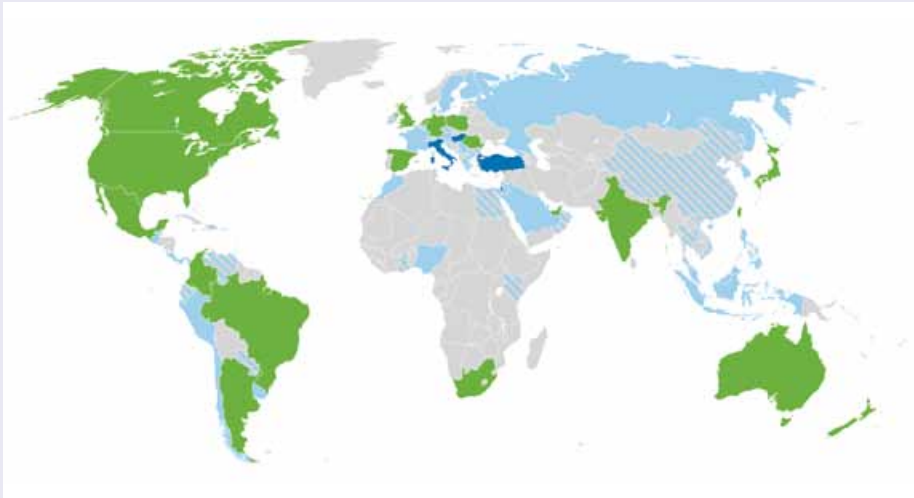
We are also leading the development of a 'Green Building Sectoral Agreement'. The purpose of this is to establish a very clear and compelling case for tackling greenhouse gas emissions from the buildings sector through a multilateral agreement, supported by industry, governments and third sector stakeholders. Crucially it is also designed to mobilize action, focusing on: promotion of the Common Carbon Metric; the development of national and regional building codes or regulations; demonstration projects; and creating benchmarking and baseline data. For countries that already have overall emissions targets, sectoral agreements can be one of several means of achieving them, and for countries without economy-wide targets, sectoral commitments can be a good first step towards them.

During World Green Building Week 2010 (September 20-26), the WorldGBC network is delighted to be able bring our growing network together in a series of synchronized green building events hosted by Green Building Councils around the world. The world is changing fast, and once a year we celebrate the different strengths and activities of this expanding global movement. Looking forward, we will also be organizing a range of activities at the global climate negotiations (COP16) in Mexico later this year.



Jane Henley, Chief Executive Officer, World Green Building Council

# THE WORLD GREEN BUILDING COUNCIL NETWORK



## Europe

Albania  
Austria  
Belgium  
Bulgaria  
Croatia  
Czech Republic  
Denmark  
Finland  
France  
Georgia  
Germany  
Greece  
Hungary  
Ireland  
Israel  
Italy  
Montenegro  
Poland  
Romania  
Russia  
Serbia  
Slovenia  
Spain  
Sweden  
Switzerland  
Turkey  
United Kingdom

## Americas/ Caribbean

Argentina  
Bahamas  
Brazil  
Canada  
Cayman Islands  
Chile  
Colombia  
Costa Rica  
Dominican Republic  
Ecuador  
El Salvador  
Guatemala  
Mexico  
Panama  
Paraguay  
Peru  
Uruguay  
USA  
Venezuela

## Africa/Middle East

Egypt  
Ghana  
Jordan  
Kenya  
Mauritius

- Established GBCs
- Emerging GBCs
- Prospective GBCs
- Associated Groups

Morocco  
Nigeria  
Oman  
Palestine  
Qatar  
Saudi Arabia  
South Africa  
United Arab Emirates

## Asia Pacific

Australia  
China  
Hong Kong  
India  
Indonesia  
Japan  
Malaysia  
New Zealand  
Philippines  
Singapore  
South Korea  
Taiwan  
Thailand  
Vietnam

“Over twenty years ago, Toronto and Region Conservation Authority (TRCA) identified green buildings as a critical part of the solution to mitigate and adapt to climate change, but over the years, we have come to recognize that green buildings go beyond the environmental sector to provide immense social and economic benefits.

As a Founding Partner of the WorldGBC, TRCA is proud to witness the rapid global expansion of Green Building Councils. WorldGBC is providing the leadership necessary to transform the international building sector to build sustainable communities based on the same principles TRCA considers integral to its work in the Toronto region.”

Brian Denney, CAO,  
Toronto and Region  
Conservation Authority



Achim Steiner Credit: UNEP

“If targets for greenhouse gas (GHG) emissions reduction are to be met, decision-makers must unlock the potential of the building sector with much greater seriousness and vigor than they have to date and make mitigation of building-related emissions a cornerstone of every national climate change strategy. Together, we must raise awareness of the important role of this sector as a priority in meeting national GHG emission reduction targets. We must form national and regional baselines for building-related emissions using a consistent international approach, such as the Common Carbon Metric to measure, report, and verify performance.

We must also support energy efficiency and emission reduction programmes in the building sector by recognizing them as a Nationally Appropriate Mitigation Action (NAMA) and reforming the Clean Development Mechanism to improve energy efficiency and reduce correlating GHG emissions at the lowest average CO<sub>2</sub> abatement cost relative to other sectors.

This sector is responsible for 60 percent of the world’s electricity consumption resulting in 1/3 of global energy end-use greenhouse gas emissions, earning its title as single largest contributor to human-created emissions.

Public policy is vital in triggering investment in energy efficient building stock, achieving energy and cost savings, reducing emissions, and creating millions of quality jobs. In developing countries where more than 50 percent of households (up to 80 percent in rural Africa) have no access to electricity, affordable, energy efficient, low-carbon housing helps address energy poverty.”

Achim Steiner, Executive Director,  
United Nations Environment Programme

	Population	Population growth rate (%)	Urban population (%)	Annual rate of urbanization (%)	Population below poverty line (%)	Unemployment rate (%)
Egypt	78,866,635	2.033	43	1.8	20.0	9.4
Mauritius	1,284,264	0.776	42	0.9	8%	7.3
Morocco	31,285,174	1.099	56	1.8	15.0	9.1
S. Africa	49,052,489	0.281	61	1.4	50.0	24.0
UAE	4,798,491	3.689	78	2.9	19.5	2.4
Brazil	198,739,269	1.200	86	1.8	26.0	8.1
Canada	33,487,208	0.800	80	1.0	10.8	8.3
Colombia	43,677,372	1.219	74	1.7	46.8	12%
Mexico	111,211,789	1.13	77	1.5	18.2	5.5
USA	307,212,123	0.977	82	1.3	12.0	9.3
Australia	21,262,641	1.195	89	1.2	N/A	5.6
India	1,156,897,766	1.407	29	2.4	25.0	10.7
Japan	127,078,679	-0.191	66	0.2	N/A	5.1
Singapore	4,657,542	0.998	100	1.2	N/A	3.0
France	64,420,073	0.549	77	0.8	6.2	9.1
Germany	82,329,758	-0.053	74	0.1	11.0	7.5
Romania	22,215,421	-0.147	54	-0.1	25.0	7.8
Spain	40,525,002	0.072	77	0.9	19.8	18
Turkey	76,805,524	1.312	69	1.9	17.1	14.1
UK	61,113,205	0.279	90	0.5	14.0	7.6

Source: The World Factbook 2009. Washington, DC: Central Intelligence Agency, 2009

# AFRICA AND THE MIDDLE EAST

Africa is seen as the continent most vulnerable to the impacts of projected climate change because widespread poverty limits its adaptation capabilities. Other vulnerabilities such as an overdependence on rain-fed agriculture mean that Africa's social and economic development is under more pressure, as climate change threatens to undermine the integrity of the continent's ecosystems. Therefore the challenges for achieving real results in adaptation and mitigation are steep.

In its 4th Assessment Report, the IPCC presented a list of expected future impacts of climate change for Africa. The report outlines predicted impacts on a wide range of natural habitats and resources including water shortages, disruption to ecosystems, and damage to the coastal zone, as well as impacts across different sectors including: energy, health, agriculture, tourism, industry and infrastructure.

Human health is one of the areas most under threat. Issues such as heat stress, air pollution, weather disasters, food security and demographic changes can all be linked to climate change and its ability to exacerbate existing vulnerabilities. A central concern is the link between climate variability and the proliferation of infectious diseases, whether it be vector-borne, water-borne or food-borne.

Another continent-wide issue that Africa's future prosperity hinges on is the impact that climate change will have on water resources. Currently around two-thirds of the rural population and one-quarter of the urban population lack access to safe drinking water. This is compounded by the fact that population fluctuations and current water trends indicate that more African countries will exceed the limits of their economically useable, land-based water resources before 2025. In addition to this, climate change could cause a decline in the productivity of

land and alter fundamental socio-economic conditions, rendering people chronically vulnerable to food insecurity.<sup>2</sup>

In the Middle East, a region where the climate is already typified by very low rainfall, and very high temperatures, the impacts of climate change could exacerbate existing problems. In UAE for example, a country which already has a very high per capita ecological footprint, projected rising temperatures could put additional strain on natural resources through a growing need for air conditioning in buildings.

<sup>2</sup> Boko et al. IPCC 4th Assessment Report, 2007

*Across Africa and the Middle East, the scarcity of water is a major issue.*



Egypt is a country that is experiencing rapid growth. The population is approaching 100 million and this is putting considerable strain on natural resources, public services, housing and infrastructure.

As the pace of housing construction quickens, public demand for power will grow exponentially. At some point in the not so distant future, unless urgent action is undertaken, the energy independence of Egypt may be compromised. The development, design, implementation and enforcement of a practical, energy efficient building code was the first logical step forward in a matter of critical importance to the nation.



#### **Egypt Green Building Council**

- Formed January 2009
- The EGBC is a developing Council and has yet to accept any members.
- The Council was instrumental in the creation of the Egyptian Building Energy Efficiency Code (BEEC).



### **FOCUS**

#### **Eco Villages National Project**

The GBC has been involved in the design and planning of the country's first eco village which will be located south of Cairo, and is motivated by Egypt's critical situation with its homeless population. The rising homeless population has a direct effect on the economy, security and social solidarity of the country. The eco village will be a place where homeless people can regain their place in Egyptian society, make positive contributions to their lives and indirectly improve the welfare of the nation. Within this sustainably designed model, the proposed Eco-village is expected to deliver to its community members guaranteed health care, basic education, religious guidance, effective social assimilation, work training, and skill development. In return the community will produce food, energy, and the output of numerous cooperative enterprises.

### **BUILDING STATISTICS**

- Lighting and cooling are major consumers of energy that, together, represent almost 60% of the nation's power requirements.
- All residential and commercial building codes and the Energy Efficiency Law for Standards and Labeling are now mandatory.

# AFRICA AND THE MIDDLE EAST MAURITIUS

In recent years Mauritius has enjoyed rapid economic growth that has enabled it to reduce poverty and promote social equity while maintaining high standards of environmental protection. Socially there are still issues to be tackled. Women make up 61% of the nation's unemployed, most of whom found themselves out of a job when the textile and clothing sectors suffered during the global recession, and work needs to be done to protect the more vulnerable in society. Education is also a key priority.

As the country's economy expands, the environment is put under increasing pressure. The key environmental challenges that the country is faced with are coastal erosion, water management and the impacts of climate change. However strategies are in place to help minimize the impact of climate change on the economy.

The government has made it a priority to develop a systematic approach to reduce vulnerability to extreme weather events and structure any rebuilding efforts along sustainable lines. To this end, the Prime Minister's Office has set up The Central Cyclone and Other Natural Disaster Committee, focusing on disaster management by coordinating prevention and mitigation, preparedness and response strategies.

## GBCM

### Green Building Council of Mauritius (GBCM)

- Formed in 2009 and is currently in development
- Expects to begin accepting members in October 2010, coinciding with its first event
- GBCM is working in collaboration with financial institutions, Government and international agencies to implement credit products such as "green mortgages" or other financing mechanisms that reward sustainable measures in buildings.

## FOCUS

### Government Strategy: Maurice Ile Durable (Mauritius Sustainable Island)

First put forward in 2008, the main thrust of the project is to make Mauritius less dependent on fossil fuels, with a target of 65% autonomy by 2028 through increased utilisation of renewable energy and increased energy efficiency.

As part of the strategy the government is investing the equivalent of \$800m USD on creating a green national infrastructure, focusing on better transport networks, cleaner energy generation and energy efficiency.

Green building features prominently in this strategy, with the government aiming to work out a green performance framework for new and existing public buildings and establish an Energy Efficiency Management Office to provide prototype designs for green homes and buildings.

## BUILDING STATISTICS

- Energy generation is the main source of CO<sub>2</sub> in Mauritius, contributing around 58% of the emissions in 2008, however the percentage of this energy that is used in buildings is not known.
- The total primary energy requirement of the country increased by 2% in 2008. Around 82% of the total primary energy requirement was met by imported fuels (oil, LPG and coal) and the remaining 18%, obtained from local sources (gas and hydro).
- The first BREEAM rated building in the country is currently under construction.

Morocco has struggled to remain competitive in the global economy and to address this issue, the government has sought to increase economic efficiency across the country, increase training for workforces, raise administrative standards and improve the basic infrastructure and quality of urban environments to encourage growth and investment.

There are social issues that are barriers to sustainable development. There is a need to act on urban sprawl that can result in social fragmentation and unequal access to social services. There are also efforts to tackle marginalization by enhancing social equity through equal access to basic human needs such as housing, employment, community facilities and utilities. There are also environmental challenges such as the need to preserve natural environments under pressure from urban growth, and the reliance on non-renewable natural resources.



**MOROCCO  
GREEN BUILDING  
COUNCIL**

#### **Morocco Green Building Council (MGBC)**

- Formed in September of 2009 and is currently in development.
- Expects to begin accepting members soon.

## **FOCUS**

### **Green Morocco Plan**

The GBC is working with the government of Morocco in developing several new green cities as part of the Green Morocco Plan launched by King Mohammed VI. The city of Zenata is one example, which is situated between Casablanca and Rabat. It will include thousands of new homes, featuring sustainable design, and the initiative is aimed at alleviating the demographic pressure in this most populated region in the country.

# **AFRICA AND THE MIDDLE EAST MOROCCO**

# AFRICA AND THE MIDDLE EAST

## SOUTH AFRICA

South Africa is a country of contrasts. The 'developed sector' of the economy is on a par with developed economies anywhere, on almost any criteria – excellent health facilities, world-class education, high-end housing and sophisticated commercial buildings.

However, the 'developing sector' encompasses all the challenges of developing economies worldwide – widespread unemployment and poverty, lack of skills and education, low levels of health care and lack of housing.

In the 'developed' commercial property market in South Africa, green building is very much on the agenda. The Green Building Council of South Africa (GBCSA) has had a major impact, with virtually all of the country's major owners and institutions making some level of commitment to green building.

National government has also promoted green building with a widespread programme to retrofit public buildings to make them more energy efficient. However, with the extent of the socio-economic challenges facing the country, development issues are the government's overwhelming priority.

The GBCSA is cognisant of the fact that, while it has had a significant impact in the developed sector of the South African economy, much can be done through the building process to address the issues of the developing sector too.

Aspects such as employment creation, skills training and health are not addressed by the conventional notion of green building, but are part of the broader notion of 'sustainability', and GBCSA is starting to explore ways in which these could be addressed through the green building process.



### The Green Building Council of South Africa (GBCSA)

- The GBCSA was formed in 2007.
- As of August 2010, the GBCSA currently has 650 member organizations from a diverse range of sub-sectors of the South African construction and property sector.
- GBCSA has adapted the Australian Green Star scheme and localised the tool for the South African environmental context and market.
- To date, the GBCSA has released Green Star SA Office and Retail Centre rating tools, and is currently developing a Multi-Unit Residential tool.

### BUILDING STATISTICS

- The most recent estimates (using 2006 data) put the total building stock in South Africa (SA) at around 12.5 million residential dwellings and approximately 93.4 million square metres of non-residential building space.
- Within the residential sector, where the largest disparities exist in dwelling standards, 8.5 million dwellings are considered 'formal' with the remainder consisting of informal housing, squatter units and traditional dwellings.
- Low income (less than 80m<sup>2</sup>/dwelling) housing accounts for 43% of new residential floor space.
- The long-term growth rate for commercial property investment is around 1.9% per annum.

## FOCUS

### The Kuyasa CDM Project

Within the residential sector, several projects have been implemented by NGOs within poor urban areas, with a focus on energy efficiency and low carbon solutions and the generation of Carbon Emission Reduction certificates (CERs) as a Clean Development Mechanism (CDM) project registered under the Kyoto Protocol.

This Kuyasa CDM project entailed the retrofitting of 2300 homes in an established low-income housing area in Khayelitsha, Cape Town. The interventions were to install insulated ceilings, energy-efficient light bulbs and solar water heaters. The objectives are to reduce energy consumption and improve the social, health and economic wellbeing of the residents.

The project is South Africa's first internationally registered CDM project under the Kyoto Protocol and the first Gold Standard project to be registered in the world. Carbon credits were sold, with the intention of using the revenue to establish a trust to employ and train local residents to provide ongoing long-term maintenance for the solar water heaters.

The GBCSA is exploring how these issues could be incorporated into a formal rating tool that would enable it to expand its effectiveness to meet the major developmental challenges faced in South Africa and other developing countries.

### Tsoga Environmental Centre

The Holcim Award-winning 'Tsoga Environmental Centre' is an environmental

education centre in Samora Machel, a marginalised township on the Cape Flats in Cape Town. The specific objective in developing the building was to respond to both the environmental and socio-economic issues of sustainability.

The building addresses conventional green building aspects using passive design to minimise energy consumption, generating energy through a bio-gas digester and wind turbine, processing and using all grey-and black-water on site, and maximising the use of recycled and local materials. Where it exceeded the traditional green building concerns was by creating employment, offering training and empowering the local community. Labour-intensive construction methods were used, which enabled 80% of the building budget to be committed to employment, as opposed to the conventional 30-50%.

The community was involved throughout the design and construction process, and all construction workers received training, which was designed such that workers would learn both specific skills and a general problem-solving approach which would be transferable. Components of the building were designed so that they could be supplied by local small enterprises: brick recycling, door and window manufacture, burglar bars, reed ceilings and landscaping were "outsourced" to local enterprises. Material suppliers were assessed for compliance with fair labour practice and support for 'historically disadvantaged' individuals (ie individuals who were discriminated against under the 'apartheid' regime). Technology used was appropriate to the skills level of the community.



*The Kuyasa CDM project entailed the retrofitting of 2,300 homes with solar water heaters, insulation and energy efficient light bulbs.  
Credit: www.kuyasacdm.co.za*

**National government has also promoted green building with a widespread programme to retrofit public buildings to make them more energy efficient.**

# AFRICA AND THE MIDDLE EAST UNITED ARAB EMIRATES

The UAE has the highest ecological footprint and the second highest CO<sub>2</sub> emissions per capita in the world. It is an arid land, with a serious shortage of surface water, and is highly dependent on desalinated water, with an estimated consumption in excess of 400 litres/person/day.

There are also other challenges. Electricity is mostly generated from gas, and total yearly consumption is high due to demand for air conditioning. Most building materials have to be imported into the country and, since the recession, there is an over-supply of real estate on the market.

However, the UAE government is embracing green building legislation. The emirate of Abu Dhabi has recently introduced its own "Estidama" rating system for Communities, New Buildings and Villas. However, no formal incentives are offered for retrofitting existing buildings as the UAE is a tax free state.

The high profile MASDAR initiative is a project to develop a zero carbon city based in Abu Dhabi. The construction of the first stage is completed, which includes a 10 MW solar power plant.

## BUILDING STATISTICS

- There is not currently enough data on green building to provide statistics. However it is known that per capita the use of energy in buildings is generally higher in the UAE due to the extreme temperatures and the need for significant cooling and air conditioning.
- 19 Buildings are US LEED rated, all of which are in Dubai.



## Emirates Green Building Council (EGBC)

- Established in July 2006 and was the first GBC to be established in the Middle East.
- The EGBC has around 300 members.
- Abu Dhabi has already introduced a rating tool through their Estidama system.
- In general the USGBC LEED rating system is widely accepted for the time being as a rating tool where a total of 518 projects are registered with USGBC for LEED certification.
- There is interest in a 'BREEAM Gulf' tool.



UAE Dubai Marina and Palm.  
Credit: [www.istockphoto.com](http://www.istockphoto.com)

*The plentiful sunshine means an abundance of solar power but also a high demand for electricity for air conditioning. Credit: [www.istockphoto.com](http://www.istockphoto.com)*

The emirate of Abu Dhabi has recently introduced its own “Estidama” rating system for Communities, New Buildings and Villas.



# THE AMERICAS

The Americas region is traditionally divided into three geographical regions (North, Central and South) and with each sub-region comes a widely varying set of social, economic and environmental issues, as well as vast differences in climate, geography and wealth. As a result, the countries within this region have different priorities and approaches to sustainability. In North America, sustainability is frequently associated with recycling, energy conservation and ecological protection, whereas in the South sustainability is connected with poverty alleviation, development and movements against resource exploitation.

Climate change is expected to have a severe impact and some countries are already feeling its effects. Central America and the Caribbean are seeing increasingly frequent and intense weather events, coastal erosion and changing rainfall patterns. Climate change is also causing glaciers across the region to melt. Within the next 15 years, tropical glaciers like those found in the Andean region of South America are predicted to completely disappear, leading to changes in rainfall patterns that are estimated to drastically affect water availability for tens of millions of people and reduce hydroelectric generation, which makes up a significant portion of energy generation in several countries.<sup>3</sup>

In a warmer climate, insects can spread more rapidly, putting many old-growth forests and their large carbon stores at risk. Rising temperatures and changes in precipitation patterns are expected to worsen the already significant water shortage in the 'bread basket' or central states of the US – which has important consequences for agricultural output. Coastal areas are increasingly at risk of sea-level rise and storm surges as hurricanes increase in severity.<sup>4</sup>

In recent years the region has suffered from a number of natural disasters and extreme

weather events. In 2010 alone, the Americas suffered the devastating effects of the Haitian earthquake; Tropical Storm Agatha - the deadliest tropical cyclone in the eastern Pacific since 1997, which resulted in the severe flooding of Guatemala, Nicaragua, and El Salvador; the Chilean earthquake, which displaced 1.5 million people; and Hurricane Alex, which tore up the eastern Mexican coastline. A few years earlier, the U.S. bore witness to the utter destruction of Hurricane Katrina and Hurricane Rita along the Gulf Coast- two Category 5 and Category 3 hurricanes within one month of each other in 2005.

The disasters in the Americas have also provided an eye-opening insight into how city infrastructure and housing in vulnerable areas can be built, and rebuilt, both sustainably and resiliently with climate adaptation in mind. Buildings and infrastructure that protect valuable ecosystem services, are sited appropriately away from flood plains, and utilize both design methods and materials to increase resistance to extreme weather can drastically reduce the social and economical toll of natural disasters on a community.

*New Orleans Credit: www.istockphoto.com*



“Reducing greenhouse gas emissions from buildings will bring multiple benefits to both the economy and to society. The building sector contributes up to 30% of global annual greenhouse gas emissions and consumes up to 40% of all energy. The construction, renovation, and maintenance of buildings contribute 10 to 40% of countries’ Gross Domestic Product (GDP), and represent on a global average 10% of country-level employment. If carefully planned, greenhouse gas mitigation strategies for buildings can stimulate the growth of new businesses and jobs, as well as contribute to other, equally pressing, social development goals, such as better and more sustainable housing and access to clean energy and water. Such strategies may promote minimization of energy consumption, improvement of climate adaptability, as well as support to the dissemination of renewable energy alternatives.

**An opportunity is offered by the climate change crisis to strengthen the cooperation with all stakeholders involved in the building sector and establish the foundation for sustainable development today and for the future.”**

Ms. Margarita Astrálaga, Regional Director, UNEP Regional Office for Latin America and the Caribbean

“No society will have a chance to prosper if a foreseeable future is not in sight and we all know that a sustainable environment won’t arrive overnight.

Creating the bases for a world in which everyone has a fair chance to live in will take generations of people investing on behalf of those who are not born yet, while giving up expectations of an immediate payoff. It is no longer about us, today, it is about a future that doesn’t belong to us.

I can’t think of a more encouraging message to our society as a whole, than the living example of sustainable buildings, they will be here long after today’s builders are gone.”

Claudio Tanco, Head of Corporate Real Estate, HSBC

<sup>3</sup> UNFCCC, 2007, Climate Change Impacts, Vulnerabilities and Adaptation in Developing Countries

<sup>4</sup> Nicholls, R.J., P.P. Wong, V.R. Burkett, J.O. Codignotto, J.E. Hay, R.F. McLean, S. Ragoonaden and C.D. Woodroffe, 2007: Coastal systems and low-lying areas. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK

**The disasters in the Americas have provided an eye-opening insight into how city infrastructure can be rebuilt, both sustainably and resiliently.**

# THE AMERICAS BRAZIL

Brazil is the largest country in South America, in terms of population, area, and economy. The population is highly urbanized and population growth is relatively high. These factors, combined with very uneven income distribution, contribute to an ongoing housing shortage. Crime remains a major challenge for government.

There are a number of critical environmental concerns in Brazil, with deforestation of the Amazon rainforest being amongst the most pressing. The rainforest constitutes a globally significant carbon sink, which is being depleted due to agriculture, logging, and development. Urban pollution is another key environmental priority, and green buildings can play an important role in the effort to make Brazil's cities healthier and more sustainable.

Green building in Brazil is playing an important role in providing affordable, quality housing across the country. The Federal Government is currently investing a lot in infrastructure through its 'Growth Acceleration Programme', and it has also initiated the "Minha Casa Minha Vida" <sup>5</sup> project which is designed to stimulate the growth of popular dwellings to end the housing shortage in Brazil.

Various levels of government have developed policies to improve energy efficiency and encourage sustainability. "Procel Edifica" is a federal initiative that rates buildings according to their energy efficiency performance. Currently this is a voluntary initiative, but it may become a requirement in the near future. Many Brazilian cities have also shown leadership by requiring waste reduction plans for construction projects, solar water heaters for medium and large residential developments, and providing incentives such as increased height or floorspace allowances for proposals that incorporate green building principles.

Many of the larger Brazilian cities are developing carbon emissions reporting

tools as part of their strategies for reducing emissions. The city of São Paulo has already published its carbon emission report and approved the law to attain its goals - a 30% reduction in emissions by 2012 compared to 2005 levels. This law specifically addresses the civil construction industry and green building practices.



## GBC BRASIL

### Green Building Council Brasil (GBC Brasil)

- Established in March 2007
- Membership base of 370 companies.

## BUILDING STATISTICS

- Buildings are responsible for 42% of energy consumption and 35% of emissions in Brazil.
- The Brazilian civil construction industry is responsible for 9.2% of the GDP.
- There are 16 LEED certified buildings and 180 registered for LEED certification.

<sup>5</sup> Translation: "My house my life."

<sup>6</sup> Folha.com; [http://www.gbcbrasil.org.br/in/index.php?pag=noticia\\_full.php&id=156](http://www.gbcbrasil.org.br/in/index.php?pag=noticia_full.php&id=156)

## FOCUS

### Brazil's "Green" World Cup 2014

Brazil is synonymous with football and football has always been a source of pride for Brazilians. Official host of the 2014 FIFA World Cup, Brazil is looking to showcase something never before seen in the world of football – the very first "Green World Cup".

BrazilGBC is working closely with World Cup organizers to ensure that the country's new stadia demonstrate state of the art environmental design. In order to secure up to \$400 million in financing from the Brazilian Development Bank (BNDVS) for each of the proposed stadia, the structures must meet the environmental requirements of the Ministry of Sports. Key focus areas of these requirements include design elements such as a waste collection program and greywater capture, as well as construction elements such as the use of locally sourced materials.

According to Vicente de Castro Mello, an architect responsible for the design of the National Stadium in Brasilia, the added investment of building a 'green' stadium will pay itself off within 7-10 years following construction. The National Stadium in Brasilia is currently seeking LEED certification. Gustavo Penna, an architect working on the retrofit of the Mineirão Stadium in Belo Horizonte, believes that once complete, the stadium will be able to produce enough of its own energy through solar panels to meet the energy demand on match days.<sup>6</sup>



*The new National Stadium in Brasilia is currently seeking LEED certification.  
Credit: Castro Mello Architects*



# THE AMERICAS CANADA

With the second largest land area in the world, a highly urbanized population and a diverse economy, Canada is faced with a range of social, economic and environmental challenges. As the population continues to grow, meeting the demand for housing in a sustainable manner is a key priority. A lack of affordable housing in many urban centers and First Nations reserves is a critical aspect of this. Due to the harsh climate in many parts of the country, increasing energy efficiency through stricter building codes and incentives for increasing performance in both new and existing buildings is also an important priority.

A variety of extractive industries play a significant role in the Canadian economy, and a major priority in these industries is to maintain valuable employment and investment while integrating various sustainability goals. The effects of climate change such as melting arctic ice, thawing of tundra and expansion of pests will directly impact many sectors of the Canadian economy including agriculture, forestry, fisheries, and oil. Northern and First Nations communities will also be affected as ice recedes and winters become shorter. Reducing emissions in the building sector and other areas is a major priority in terms of mitigating negative impacts on both the ecosystems across the country and the national economy.

The Canadian Government's position on the role of the built environment in terms of climate change mitigation is one that seeks to balance environmental protection and economic prosperity. A major focus has been on energy efficiency, and the federal government has introduced several policies through the Office for Energy Efficiency since it was established in 1998. The government is also looking to lead by example and since 2005 all new government office buildings have had to meet LEED Gold standards. The government is committed to investing in green infrastructure, energy efficiency, clean energy technologies and the

production of cleaner energy and cleaner fuels as shown through the Government of Canada's investment of close to \$10 billion since 2006.

CanadaGBC is involved in green building advocacy at both provincial and federal levels. Initiatives include the 'Living Building Challenge'—educational workshops which pull together the most progressive thinking from the worlds of architecture, engineering, planning, landscape design and policy—and the 'Smart Growth Program.' The CaGBC is also working together with the Federation of Canadian Municipalities (FCM) on capturing the widespread interest from different levels of the public and the private sector regarding the green loan concept. The GBC and FCM are developing a one-day strategic workshop with senior levels of government and key business leaders to create a framework which will address growing market and societal demands for effective green financing.



## Canada Green Building Council (CaGBC)

- Established in 2002
- 2,300 corporate members from across the building sector.
- Developing the next generation of LEED in Canada.
- CaGBC has launched GREEN UP - Canada's Building Performance Program.

<sup>7</sup> [http://www.bchousing.org/news/news\\_releases/2009/01/07/5590\\_0901071102-000](http://www.bchousing.org/news/news_releases/2009/01/07/5590_0901071102-000)

## FOCUS

### Haven Gardens: Cranbrook's LEED Second-Stage Housing

Haven Gardens, a LEED Gold development in Cranbrook, British Columbia, is a place where women and children fleeing from abusive relationships can call home. This three-storey wood frame development includes 18 units of second-stage housing, made possible by the Canadian Mental Health Association (CMHA) for the Kootenays' region.

Bill Bennett, East Kootenay MLA and Minister of Energy, Mines, and Petroleum Resources, explains that "This housing will provide a stable and supportive environment for women and children who are at risk of homelessness. We have a wonderful transition house in Cranbrook, but the women and children who flee to our transition house must leave after a set period of time to make space for those in urgent need. Often, they have nowhere to go. With this new facility, they will have a very positive option they have not had before and will not be as likely to return to a violent or abusive situation."

While supporting an important social cause, the building also demonstrates excellent environmental performance including a storm water management plan, close proximity to public transportation, and use of locally-sourced and recycled building materials, among other features. In addition, the building was designed such that 90% of the spaces have views to the exterior. The CMHA even initiated a green building education policy with the purpose of educating the residents and visitors of Haven Gardens about the buildings key features and many benefits.<sup>7</sup>



Vancouver Harbor.  
Credit: www.istockphot

## BUILDING STATISTICS

- 41% of emissions in Canada originate from buildings
- Between 1990 and 2005 energy use in the commercial and institutional building sector increased 33% despite the availability of energy efficiency technologies
- Current estimates for domestic new builds in Canada are between 166,900 and 199,600 units in 2010
- There are 249 LEED Certified Buildings in Canada (with 196 certified by CaGBC) and another 2,400 that are registered for LEED certification
- There are 308 buildings registered with the GREEN UP benchmarking program

**As the population continues to grow, meeting the demand for housing in a sustainable manner is a key priority.**

# THE AMERICAS COLOMBIA

The environmental and urban issues Colombia faces are numerous. Large developments of informal settlements, especially on the urban periphery, are common place, due to urban poverty. Informal settlements in Colombia account for nearly 20% of the housing provision that the urban population needs, and people settle in illegal locations (landslide risk areas, floodable lands or environmentally protected areas) which offer a poor urban environment, few or non-existent public spaces, and many times no basic infrastructure or urban services (water, sanitation, public buildings or transportation). In 2007, the housing shortage in Colombia reached 3.8 million units, and each year nearly 177,000 families have to look for a home in the informal segment of the housing market.

Due to suburbanization and changes in land uses, many of Colombia's urban centres have become obsolete, losing important resident population and businesses to other city areas, and as Colombian cities have grown and increased their densities, the quality and supply of public space has reduced.

Increasing urbanisation has also put a strain on biodiversity. Urbanisation, coupled with other issues such as the growth of some biofuel crops and habitat pollution, has resulted in an increase in the number of threatened species and some protected areas have been reduced.

The impacts of climate change are also bringing new challenges: Colombia has 92% of the moorlands (páramos) of the planet, and due to rising temperatures such environments and their endemic populations are at risk. It has also been predicted that Colombia's glaciers will completely disappear within the next 100 years.

Since the early 1990s, Colombia has taken a series of actions to reduce GHG emissions and to increase their capture. However, Colombia lacks a comprehensive green building policy



## Colombia Green Building Council (CGBC)

- Formed in February 2008 and has 117 members.
- CGBC engages with both national and regional/local governments, seeking to influence policy and proposing green building incentives.
- Colombia GBC is also working with the Government and the ICONTEC (the Colombian Technical Rating Institute) to develop a Colombian Environmental Green Building Certification System for new constructions, which may also incorporate certification of low-income housing projects and other low-margin sectors.

framework at this point in time, although there are some guidelines in different academic studies and legislative acts that aim to promote compact and dense cities avoiding urban sprawl.

The government is currently writing a white paper on actions for climate change mitigation, and GBC Colombia (CGBC) is working for the inclusion of sustainable development and construction guidelines. To encourage greener development, there are some tax incentives, and CGBC is currently working with national and local governments to design and implement different kind of incentives to support green building, as part of a national policy on sustainable urban development and green building.

<sup>8</sup> CIA World Fact book - <https://www.cia.gov/library/publications/the-world-factbook/geos/co.html>,

## FOCUS

### Green City: A Holistic Vision of Urban Development

One of the largest residential projects in the country, Green City, located in Bogotá, is an example of a large-scale “green urbanism” operation. This project proposes a balance between green and liveable areas. Green City covers an area of 328 hectares, 108 will be designated towards the construction of more than 36,000 low-income homes, a combination of houses and apartments, which will be sold between 2010 and 2016, and will be developed by several developers. The remaining 220 hectares will be designated to develop public areas and amenities.

The project stands out for its proposed mix of uses, which supports the generation of economic activities and jobs for the inhabitants of the sector and the local municipality. In this way, dynamic communities that live, work and enjoy their surroundings are created, without generating impacts associated with dispersed urban life such as traffic and the excessive commuting times between residential areas and work areas.

In the first stage the investment in infrastructure will rise to US\$30.2 million, create 21,000 direct and indirect jobs, and offer public facilities for the community, such as a health centre, a school with a library, a nursery, a shopping centre with a supermarket, green zones and parks, ample routes of transportation and routes for the buses that feed into the massive transportation system.

Green City demonstrates that it is possible to develop scaled solutions for lower income families in ways that are socially responsible and in harmony with the environment.



## BUILDING STATISTICS

- In Colombia no current figures are available on emissions from buildings or the construction sector.
- The construction sector in Colombia represents 6% of GDP and the sector accounts for 5% of the total labour force.<sup>8</sup>
- There is one LEED (Silver) certified green building in Colombia (an office building owned by Novartis). Additionally, there are 27 LEED registered projects.

Credit: ColombiaGBC

# THE AMERICAS MEXICO

In Mexico, the national distribution of wealth is markedly unbalanced, and infrastructure and technology availability also varies from region to region. As a result, Mexicans are affected by environmental, social and economical problems such as lack of affordable housing, problems with basic urban infrastructure, water shortages, energy availability, etc; all these challenges being increased by the latest global recession. In addition, the citizens have experienced a recent security crisis, due to violence from illegal drug activities.

As in most parts of the world, some areas of Mexico have been hit lately by extreme weather. For example, in July 2010 hurricane 'Alex' brought to Monterrey City its average total yearly rainfall in only 48 hours. The ensuing floods washed away homes, roads and major public infrastructure services at a cost of ca. \$1.2 billion dollars. The federal and state governments are developing –along with the academia and the local industry- a 'Green Renewal Project' at the main river embankments and the affected areas, in the light of future climate change risks.

The Mexican government's environmental policy aims to stop the historical trends of environmental degradation and depletion of natural resources, and looks to stimulate significant economic growth through cleaner production processes, and to develop services that improve the living conditions of around 26 million people suffering from extreme poverty, especially in rural areas.

In the past, the Federal Government has developed a set of actions designed to mitigate climate change, however it is not able to accurately quantify all of them. During the nineties, the Mexican economy grew on cleaner production patterns than in the past, and mechanisms were established to avoid the creation of greenhouse gases. Mexico is committed to maintaining the momentum created by such activities, irrespective of

the outcome of multilateral negotiations on climate change. Special emphasis is placed in the economic possibilities from the Clean Development Mechanism. During COP 15, Mexican President Felipe Calderon made climate change a priority. Calderon announced a commitment to cut Mexico's emissions by 50% from 2002 levels by 2050. COP 16 takes place in Mexico.



## Mexico Green Building Council (MexicoGBC)

- With 100+ members since its inception in 2005, Mexico GBC is the first non-profit non-governmental organization (NGO) in the country integrated by leading companies and organizations that wish to promote a more sustainable built environment.
- MexicoGBC serves as a platform and bridge for academia, government, businesses and other NGOs to identify the appropriate strategies to improve the built environment and as a source for green building education.
- MexicoGBC has been supporting USGBC's LEED rating system, which already has a presence in the country with 7 certified and 100+ registered projects.

<sup>9</sup> Certified Commercial Investment Member (CCIM) with Instituto Nacional De Estadística Y Geografía (INEGI) data

<sup>10</sup> Cámara Mexicana de la Industria de la Construcción (CMIC)

## FOCUS

### CDM Sustainable Housing Program

Mexico's National Housing Commission (CONAVI) has developed guidelines and methodology for the world's first national sustainable housing program that qualifies for the Clean Development Mechanism (CDM), within the context of the Kyoto Protocol. One of the requirements of the CDM involves the development of a database for tracking and monitoring GHG emissions from homes. The carbon emissions savings generated as a result of this program can then be sold in the international market as carbon stocks.

In order to qualify for the CDM Sustainable Housing program, development projects must meet certain eligibility criteria concerning their overall cost, the built area, type of building materials used, and the socio-economic level of the building occupants. In addition, the project must demonstrate that it incorporates different combinations of energy-efficient technologies. The Federal Government also contributes \$4.5 million dollars each year in housing subsidies for low-income families.

The Los Silos development is one such project that was made possible through the CDM Sustainable Housing program. Los Silos sought to create self-sustainable, affordable housing of the highest quality for low-income families. The project consists of 6,000 homes on the outskirts of Tlajomulco, Jalisco. Environmental protection and affordability were two of the project's core concepts, with a view to improving the overall quality of life for its residents. The project also included training workshops and environmental awareness raising campaigns for its future residents.

## BUILDING STATISTICS

- In 2005, buildings represented around 12% of total Mexican emissions.
- The construction industry has had the largest growth of any sector in the last 2 years. In the first 3 months of 2010 the sector contributed to 6.6% of the national GDP.<sup>9</sup>
- Nearly 1 million new houses are expected to be built yearly for the 2007-2012 period. Typical CO<sub>2</sub> emissions per urban household: 1.68 to 5.14 tons per year.
- In 2009, the total national building production was US\$17,400 million, of which nearly 50% is residential, commercial, industrial and institutional buildings.<sup>10</sup>
- Mexico is the first country worldwide to develop a Sustainable (Low-Income) Housing Program accepted as a Clean Development Mechanism (CDM) by the UN.

*The Los Silos development provides sustainable, affordable, high quality housing for low-income families. Credit: Pedro Trujol*



# THE AMERICAS USA

Both bodies of the U.S. Congress have yet to pass comprehensive clean energy legislation that limits greenhouse emissions. All of the major proposals introduced in Congress, including the American Clean Energy and Security Act (ACES) that passed by the House of Representatives in 2009, underscore the importance of the built environment in mitigating climate change through robust provisions relating to end-use energy and water efficiency in buildings. ACES establishes a long-term incentive program for modernizing and retrofitting America's existing building stock as well as incentivizing energy efficient home-mortgages, improving building efficiency codes, and creating a building energy performance labelling program. In order for this bill to become law, similar legislation must be passed in the Senate.

President Obama has led the way in pursuing sustainability goals for the federal government. In 2010, he announced a commitment to reduce federal government GHG emissions by 28% by 2020. The 14 federal agencies that have adopted LEED standards for their building stock will assist the government in achieving this target, as well as the many other sustainability targets and timetables put forth by the Obama Administration on efficiency, renewable energy, waste reduction, and more.

<sup>11</sup> Energy Information Administration (2008).

<sup>12</sup> Sources: Boozé-Allen-Hamilton, 2009; Department of Commerce, 2008.



## The U.S. Green Building Council (USGBC)

- Established in 1993
- 17,000 members, including small and large corporations, non-profits, and governments.
- The organization is currently certifying 1 million square feet per day with the LEED rating system.

## BUILDING STATISTICS

- In the U.S., the building sector accounts for 38% of GHG emissions and 40% of total energy use.<sup>11</sup>
- There are 125 million existing homes and buildings in the U.S.
- Annual new builds account for approximately 1% or less of the existing building stock in the U.S., emphasizing the need to focus on green retrofits for existing buildings.
- There are 40,339 LEED Registered or Certified buildings, including 36,588 in the US and 3,388 abroad. In 2008, green buildings occupied nearly 10% of the total construction market share.<sup>12</sup>

## FOCUS

### Natural Disasters and 'Rebuilding Green'

As the impacts of climate change become increasingly frequent, local economies must find a way to build infrastructure that is adapted to withstand more severe natural disasters, while also preserving natural ecosystems and reducing the energy use that is a chief cause of climate change. Below are three examples of work the USGBC is conducting in this area that are particularly focused on green building as a response to natural disasters.

#### Haiti

In response to the earthquake disaster in Haiti, USGBC has partnered with Architecture for Humanity and the American Institute of Architecture to support a Sustainable Design Fellowship. The Fellow will be stationed with Architecture for Humanity's team in Haiti, to assist in sustainable rebuilding efforts.

#### Greensburg, Kansas

In the small town of Greensburg, Kansas, USA, residents and local government officials sought to capture opportunity in the wake of tragedy after their rural town was demolished by a tornado in 2007. A community-based effort to rebuild the town sustainably has transformed Greensburg into "Greentown," with a mission "to become a model green town for the future." Greensburg GreenTown, a grassroots community-based organization, has worked

side-by-side with city and county officials, business owners and local residents to incorporate sustainable principles into their rebuilding process.

That year, USGBC pledged that LEED projects fees would be waived for projects registering and certifying at the LEED Platinum level. Greensburg became the first city in America to commit to rebuilding their public (city-owned) buildings to LEED Platinum levels. Throughout Greensburg's green initiative rebuilding effort, USGBC and one of our long-time corporate partners, BNIM (Architecture and Design), assisted Greensburg through technical advice and community support. The Greensburg commitment has spurred local economic development and provided a blueprint for sustainable communities across the U.S.

#### New Orleans

After Katrina hit New Orleans in 2005, USGBC organized a charrette on Gulf Coast Reconstruction which resulted in The New Orleans Principles – a consensus-based document that identified specific strategies for a sustainable rebuilding effort. The principles represented a consensus among the 160 participants, including residents of New Orleans, along with experts in urban planning, waste and water management, engineering, and architecture. One of the central themes of the Principles was inclusivity; recognizing that local community involvement and investment is at the core of any effort to build or rebuild a city.



*One of many homes being built by Make It Right New Orleans, the post-Hurricane Katrina housing initiative.*

**President Obama has led the way in pursuing sustainability goals.**

# ASIA-PACIFIC

Over half of the world's new construction in the next decade is expected to occur in Asia alone.<sup>13</sup> Whereas the Asia Pacific region has already enjoyed brisk economic development in recent years, this rapid growth has not come without cost to the environment. An increase in economic prosperity, coupled with rapid population growth has placed considerable strain on energy, water and food supplies – all of which put corresponding strains on the environment. An increase in extreme weather events, which is consistent with predictions of climate change, have affected many countries through the destruction of property, disruption of agriculture, draining reservoirs and displacement of people. In Australia for example, the effects of climate change are already being felt with increasing water scarcity and devastating bush fires becoming more common.

The challenge then is to meet development priorities, including alleviating poverty and allowing the region to continue to thrive economically, while also ensuring that development minimises environmental impacts.

Prior to the economic crisis, the region had been making significant progress in the effort to achieve the Millennium Development Goals (MDG's) outlined by the UNDP.<sup>14</sup> However as the global fiscal squeeze took hold and expansion became contraction, it is now estimated that a total of 21 million people could be living on under \$1.25 a day by the end of 2010.<sup>15</sup> This increase in poverty will lead to an amplified strain on the environment as people are forced to exploit their surroundings in an effort to find a secure supply of food, energy and water.

Energy security is a central problem due to the region's heavy reliance on imported fuels, growing concerns about the increased volatility of crude oil prices, and decreasing

domestic energy reserves. Across the territory, around 1.7 billion people still rely heavily on the use of traditional biomass for cooking and heating, with nearly 1 billion living without electricity.<sup>16</sup> Lack of energy security is a key barrier to poverty alleviation and until the problem is addressed issues such as food security, water security, environmental degradation and unsustainable economic growth will continue to surface and limit development.

<sup>13</sup> Asia Business Council, Building Energy Efficiency: Why Green Buildings are Key to Asia's Future, 2007.

<sup>14</sup> The main goals are to halve extreme poverty, reduce hunger and increase access to safe drinking water, reduce child and maternal mortality, reduce diseases, achieve universal primary education and to promote gender equality and empowerment of women, ensure environmental sustainability and promote a global partnership for development.

<sup>15</sup> UN Economic and Social Commission for Asia and the Pacific (ESCAP), Achieving the Millennium Development Goals in an Era of Global Uncertainty Asia-Pacific Regional Report ,2010

<sup>16</sup> ESCAP, Energy Security and Sustainable Development in Asia and the Pacific,2008

*An increase in poverty will lead to a greater strain on the environment as people are forced to exploit their surroundings. Credit: www.istockphoto.com*



**“Green building provides the least cost path to fast and effective climate change mitigation.**

**But while building green is a no brainer, the path to greening most buildings – that is, existing buildings – is hampered by a lack of policy measures that would enable the building sector to simply and accurately measure, verify, benchmark and monetise carbon.**

**This report is a valuable addition to the argument for why and how government and industry must work together, as a matter of priority, towards achieving a sector specific global solution for the building sector.**

**Not only is carbon abatement in the building sector the least cost abatement opportunity, but it also delivers a wide range of non-greenhouse social and economic co-benefits, including creation of jobs and innovative business opportunities, improved health, wellbeing and productivity, as well as reduced demand on energy infrastructure.**

**You have to ask who wouldn't support those outcomes?”**

Maria Atkinson, Group Head of Sustainability,  
Lend Lease

**“The Hong Kong Special Administrative Region Government is committed to reducing energy intensity to tackle climate change and ensure long term sustainability. Our strategy is a multi-pronged one. Firstly, we formulate and implement green building policies backed up with legislation and incentive programmes. Secondly, we lead by example by adopting green building design and measures in government buildings. Thirdly, we enhance our built environment through constant review of city planning, urban design and urban greenery.**

**We welcome the setting up of the Hong Kong Green Building Council in 2009 to provide industry leadership in advocacy, standards-setting and training. We look forward to the World Green Building Council's support for our local endeavours. “**

Mrs Carrie Lam, Secretary for Development,  
The Government of the Hong Kong SAR

**Over half of the world's new construction in the next decade is expected to occur in Asia alone.**

# ASIA-PACIFIC AUSTRALIA

As an island nation that encompasses an entire continent, Australia has a variety of climates and a corresponding variety of ecosystems. Australia has a population of around 22 million with 89% of the population living in urban areas.

This means sustainable management of Australia's urban environments is an important priority. Other issues that affect Australia's population are water scarcity, energy efficiency and protecting vulnerable areas against bushfires. About 94% of Australia's energy is derived from combustion of fossil fuels: coal, oil and natural gas and increasingly there has been a movement to reduce the country's reliance on fossil fuels and usher in a culture centred on energy efficiency which will encourage further research into renewable and clean energy technologies.

The issue of forest fires has been well publicised globally since the Victoria bushfires that occurred in early 2009 in the south east of the country. Over 2000 houses were destroyed and 173 people lost their lives as a result of the January–February 2009 bushfires in Victoria. In an effort to combat the threat posed by bushfires, new planning and building regulations have been put in place to reduce the risk to property and lives.

Australia also faces significant challenges ensuring sustainable water supply in the face of an increasingly dry climate and a steadily rising demand for water. The Australian Government has launched the *Water for the Future* initiative that provides national leadership in water reform for all Australians. The initiative includes four key priorities: taking action on climate change, using water wisely, securing water supplies and maintaining healthy rivers.<sup>17</sup> Low water supplies have become increasingly common in many cities. The Australian Government has committed \$254.8 million through the National Water Security Plan for Cities and Towns to fund

practical projects that save water and reduce water losses in cities and towns nationally with populations of less than 50,000.

Like many countries, Australia has been affected by the global economic crisis. In the commercial building sector a sharp reduction in demand for office space, along with increased unemployment and declining economic growth forecasts, have taken a toll on the industry. With 9% of the national labour force involved in the construction industry (representing 7% of Australia's GDP), any fluctuation to this sector has a significant impact and subsequent flow on effect in the Australian economy. The Construction Forecasting Council forecasts that the construction industry will contract by \$12 billion during the upcoming two years – irrespective of the federal government's spending efforts. They estimate more than 75,000 jobs could be lost due to sharp falls in building activity.

The Green Building Council of Australia has been at the forefront of the sustainable property industry and drives the adoption of green building practices through market-based solutions. GBCA works with government, industry and the community to promote energy and water efficiency and ensure that the nation's buildings are resilient to the effects of future climate change such as flooding and bush fires.

The Australian Government has also introduced legislation to promote green building across the nation. For example, in July 2010 the Australian Government announced the 'Building Energy Efficiency Disclosure Act 2010' which requires sellers or lessors of office space of 2,000 square metres or more to obtain and disclose an up-to-date energy efficiency rating. On 25 July 2010, the Australian Government announced Tax Breaks for Green Buildings. This means that from 1 July 2011, businesses that invest in eligible assets or



green  
building  
council  
australia

### Green Building Council of Australia

- Established in 2002
- 900 Member companies of GBCA
- Rating tool: Green Star
- GBCA promotes 5 key green building priorities:
  - Provide visionary government leadership.
  - Retrofit and improve existing buildings.
  - Green education and healthcare facilities.
  - Move beyond buildings to communities and cities.
  - Embed green skills across all industry training.

capital works to improve the energy efficiency in their existing buildings will be able to apply for a one-off tax deduction of 50 % of the cost of the eligible assets or capital works.

<sup>17</sup> <http://www.environment.gov.au/water/australia/priorities.html>

<sup>18</sup> <http://www.greencrossaustralia.org/our-work/build-it-back-green/from-the-ashes-of-victoria-build-it-back-green!.aspx>

## FOCUS

### Green Cross and GBCA: Build It Back Green Victoria

The bushfires that swept through Victoria on 7 February 2009 destroyed or damaged 3,400 properties including schools, kindergartens, sporting clubs, businesses and over 2,000 homes. 173 people lost their lives.

Green Cross Australia, a not-for-profit organization that prepares communities for environmental impacts, received a grant of \$177,000 from the Victorian Government Sustainability Fund to develop a Build it Back Green website to stimulate interest in green solutions, connect residents with local suppliers and help create green jobs. The website will also incorporate a volunteering portal and Green Building Council of Australia (GBCA) is encouraging the large network of people from its 900 national corporate members from the property development and building sector to volunteer on the ground; building new homes and sustainable community infrastructure.

Build it Back Green partners hope to be a source of green jobs, advice, leadership, practical tools and capacity to assist Victorian communities to emerge as cohesive, healthy, thriving and resilient, communities. It is the aim of Build it Back Green that a minimum of 400 households will be supported to increase their eco-resilience with innovative hazard reducing materials, technologies and practices, while reducing their greenhouse emissions by 10 tonnes per annum.<sup>18</sup>

## BUILDING STATISTICS

- 23% of Australia's GHG emissions from buildings
- 12% of total energy use comes from residential sector
- Building sector accounts for 19% of energy use in Australia.
- CO<sub>2</sub> emissions per household: 5.44 t CO<sub>2</sub>/hh
- 261 certified Green Star projects in Australia with a further 431 projects registered

Credit: [www.istockphoto.com](http://www.istockphoto.com)



# ASIA-PACIFIC INDIA

India is a country that is experiencing rapid economic growth and is undergoing significant change on many fronts. Some of the key social and economic priorities are of course in relation to the rapidly urbanizing and steadily growing population, and to the developing economy.

There is a great disparity of wealth within the country, from the vast business centres of modern India, to the poorest slum neighbourhoods where meeting even the most basic needs is still an everyday challenge.

An environmental consequence of India's rapid development is the ever increasing demand for energy which is further exacerbated by the fact that roughly 55% of India's electricity is currently generated from coal.<sup>19</sup> As a result, emissions are steadily on the rise, with severe pollution, worsening air quality, and a rapidly changing natural landscape.

India's Bureau of Energy Efficiency (BEE) is the government body that oversees energy efficiency initiatives for the country and is also involved in developing energy conservation building codes. The BEE developed and launched the Energy Conservation Building Code (ECBC) for commercial buildings in 2007 with assistance from the United States Agency for International Development (USAID).<sup>20</sup> If the Energy Conservation Building Code were to be fully implemented, the overall energy consumption from new commercial buildings could be reduced by 25-40%.<sup>21</sup> If existing commercial buildings were retrofitted to these standards as well, the overall energy consumption figure would drop another 25%.<sup>22</sup>



Indian Green Building Council

## Indian Green Building Council (IGBC)

- Formed in 2001 by the Confederation of Indian Industry (CII).
- Over 960 members with good representation of the many different players involved in India's building sector.
- Customized rating tools for a variety of building types: homes, offices, factories, and schools (coming soon).

## BUILDING STATISTICS

- The construction industry in India has been growing at an astounding rate of 10% per annum over the last ten years.<sup>23</sup>
- As of August 2010, a total of 703 green building projects across the six climatic zones of the country (over 438 million sq.ft) are registered with IndiaGBC, of which 112 green buildings have been certified.
- In 2009, there was close to 200 million m<sup>2</sup> of built office space, which is expected to grow by over 70% by the year 2030 (890 million m<sup>2</sup>).<sup>24</sup>

## FOCUS

### Rating systems and the India GBC

The soon to be launched India GBC-Green Townships Rating System promotes the creation of diverse, connected, affordable, safe and healthy communities that enhance social interaction and also emphasizes the enhancement of quality of life.

Green building rating systems in India encourage the use of building materials and products that are manufactured regionally. This has provided impetus to the local community to develop green products and technologies which in turn enhanced the employment opportunities and paved the way for the creation of many new green jobs.

The Indian Green Building Council (IGBC) has received encouraging support from the government both at central and state level. For instance, IGBC is working closely with the national Ministry of Commerce and Industry (MoCI) to launch the IGBC-SEZ Rating System. In the State of Andhra Pradesh, the Hyderabad Metropolitan Development Authority (HMDA) has decided to offer automatic fast-track clearance through a Green Channel program for all applications that are awarded with a Certificate from IGBC, which specifies that the project in question is proposed to meet green building requirements. IGBC is also working with the State Government of Maharashtra to develop Environmental Guidelines for buildings.

- <sup>19</sup> Hong, W., Chiang, M., Shapiro, R., Clifford, M. (2007) Building Energy Efficiency: Why Green Buildings Are Key to Asia's Future Asia Business Council, Hong Kong.
- <sup>20</sup> <http://www.hareda.gov.in/SHABNAM.ppt#256,1,Slide 1>
- <sup>21</sup> Hong, W., Chiang, M., Shapiro, R., Clifford, M. (2007) Building Energy Efficiency: Why Green Buildings Are Key to Asia's Future Asia Business Council, Hong Kong.
- <sup>22</sup> Hong, W., Chiang, M., Shapiro, R., Clifford, M. (2007) Building Energy Efficiency: Why Green Buildings Are Key to Asia's Future Asia Business Council, Hong Kong.
- <sup>23</sup> Construction Industry Development Council, India. India Country Report, 2005-06
- <sup>24</sup> Architectural Curriculum in India. (2008). Background Paper (Draft). Available at: <http://www.eco3.org/downloads/007-Education%20Curriculum/Architecture%20Curriculum%20Background%20Paper.pdf>

*The Confederation of Indian Industry Sohrabji Godrej Green Business Centre received the prestigious LEED Platinum rating in 2003. This was the first Platinum rated green building outside of U.S.A and the third in the world. Credit: IndiaGBC*



# ASIA-PACIFIC JAPAN

**“For some time, Japan has been suffering from the decline and depopulation of provincial city centers and agricultural and fishing communities, which has become a serious social issue. The time has already come to reconsider our current social structure and plans for the future, which are based on the assumption of continuous population growth. This represents a totally new paradigm. The measures needed to counteract global warming extend over time and are inevitably linked to social reform. Therefore, it is necessary to share the vision we have for buildings and cities/regions with the citizens concerned.”<sup>25</sup>**

This quote is taken from a report by 17 building related organizations in Japan which met in the run up to the 2009 climate negotiations in Copenhagen. The group outlined a vision of a sustainable Japan for 2050 that would address a number of social, economic and environmental issues. Japan is encountering significant depopulation due to an extremely low birthrate and an aging society. Increasing urbanisation as people have moved away from rural areas into urban centres has led to urban overcrowding and sprawling communities with a loss of city centres. This in turn is characterised by the rising prevalence of energy intensive lifestyles and the rapid depletion of national resources.

A vision of a sustainable Japan is one where local resources are used, rural areas are revitalised, urban areas are sustainably managed and peoples lifestyles are based on an appreciation for the environment and an understanding of the impact that they have on their surroundings. At a national level, the Japanese Government introduced mandatory targets for reduction in overall greenhouse gas emissions for large-scale emitters as part of an emissions trading program in June 2008 which will be begin to be enforced this year. The Tokyo Metropolitan Assembly (TMA) passed the bill and thereby introduced the

first cap and trade programme in Japan and Asia.

The green building sector is crucial in the effort to tackle Japan’s social, economic and environmental challenges. By living or working in a green building, individuals develop a greater understanding of the environment and actively seek out ways to improve it. To do this, measures have to be put in place at a regional level to kick start a shift in thinking. The use of local resources should be promoted to create built environments that are specific to local requirements. Forests should be planted to offset the large amounts of wood used in the construction industry. Labelling and evaluation systems should be introduced so as to allow people to see the environmental performance of a building which could in turn boost its value and offer a fiscal incentive to go green. Perhaps most importantly, this vision must be shared with all parts of society.



Japan GreenBuild Council

## Japan Green Building Council (JaGBC)

- Established in 2001 under the auspice of the Ministry of Land, Infrastructure, Transport and Tourism.
- Rating tool: CASBEE (Comprehensive Assessment System for Built Environment Efficiency).

<sup>25</sup> Vision 2050/Building-related Measures to Counteract Global Warming towards Carbon-Neutralization, 2009,

## BUILDING STATISTICS

- Total energy-originated CO<sub>2</sub>e in Japan during 2009 was 1,304million t-CO<sub>2</sub>, of which 236million (18.1%) came from the business sector and 180million (13.8%) came from the household sector.
- In 2009, 788,410 domestic dwelling units were constructed along with 63,517 non-residential buildings.
- CO<sub>2</sub>e from buildings can be estimated as 416million t-CO<sub>2</sub> and approximately 32% of the total emissions for the country.

*Credit: www.istockphoto.com*



# ASIA-PACIFIC SINGAPORE

As a relatively low-lying, densely populated island in the tropics, Singapore is vulnerable to climate change. Much of the island is less than 15m above sea level, with a generally flat coast. In addition, Singapore has a relatively high average temperature and high average rainfall levels, and is also situated in a region in which communicable diseases such as dengue are endemic. With limited natural and physical resources as well as a small land area, Singapore has to plan long term and optimise the use of available resources of land, water, clean air and energy. Due to Singapore's geographical position and small size it has to import much of its energy with 98% of the mix being made up of fossil fuels, especially natural gas (79%).

After gaining independence in 1965, the Singaporean government pledged to alleviate the slum situation in the country by investing heavily in affordable public housing projects, continually constructing higher buildings to meet increasing demand for housing. Today 80% of all housing in Singapore is public housing, with the post independence public housing drive reaching its 50th year.

With a highly urbanised population, constructing a clean, environmentally friendly and easily manageable urban environment is central to Singapore's social, economic and environment future. Sustainability and energy efficiency are important parts of Singapore's future and continued prosperity. Up to now, Singapore's development has been underpinned by a combination of long-term vision, holistic urban planning, sound environmental policies and high regulatory standards. To meet their goal of a sustainable and livable urban space, Singapore has looked to maintain a good standard of ambient air quality, manage waste effectively to reduce the strain on landfill, conserve water supplies and increase energy efficiency.



## Singapore Green Building Council (SGBC)

- Formed in 2009
- 210 corporate and 16 associate members from across the building industry.
- Developing a dedicated Green Building Products Certification Scheme to be launched in September 2010.
- Environmental rating tool: The Green Mark Scheme (launched 2005)

In a country that has one of the highest population densities in the world, it has become important for Singapore to integrate green areas into the maze of apartment blocks and offices. Many apartment blocks now have 'green roofs' where grasses and other plants are left to grow wild. The benefits of this practice are an increase in biodiversity and a 2-degree decrease in a building's ambient temperature. The government has also built reverse osmosis plants for recycling of waste water.

*Zero Energy Building at BCA, Green Mark Platinum.*



## FOCUS

### Singapore's Green Building Masterplan

The Singapore government is leading the promotion of economic, social and environmental sustainability through a Green Building Masterplan which was first launched in 2006 and updated in 2008. The Masterplan promotes financial incentives for green building and retrofitting, minimum standards for building, research and development and building the industry's capability through education and training. The Masterplan has led to the introduction of minimum standards for buildings through revisions to the Building Control Act which mandates that all new buildings meet green requirements (implemented in 2008). In addition, the Singaporean Government promotes green building by offering financial incentives for green building projects.

A green building rating system, called the Green Mark Scheme was launched in 2005. This green building rating system

was developed by the Building and Construction Authority (BCA) and continues to be managed by the BCA, forming the backbone of the government's Masterplan. The 'Green Mark Incentive Scheme for New Buildings' (GMIS-NB) offers cash incentives to private developers, building owners and project consultants whose new project achieves a Green Mark Gold plus rating or higher.

The government has high hopes for green building and is looking to have 80% of the existing building stock Green Mark rated by 2030. Retrofitting the existing building stock is key to achieving this ambitious goal and the government's Masterplan offers further incentives for constructors and owners to go green or undertake green retrofitting programmes. The 'Green Mark Incentive Scheme for Existing Buildings' (GMIS-EB) is providing \$100 million SGD to jump start the retrofitting programme, with the scheme co-funding 35% of the retrofitting costs for energy improvements.

## BUILDING STATISTICS

Commercial and institutional buildings account for 16% of Singapore's CO<sub>2</sub> emissions, which equates to 6,235 kilo tonnes of CO<sub>2</sub>. If emissions from households and consumers are included (9% or 3,631 kilo tonnes) this equates to around 25% of total Singapore emissions.

- Due to Singapore's geographical position and small size it has to import much of its energy with 98% of the mix being made up of fossil fuels, especially natural gas (79%).
- Each year around 4 million sq metres of new buildings are constructed.
- 97% of Singapore's housing stock is apartment buildings, with the other 3% being detached or semi detached houses.
- 80% of all housing in Singapore is public housing, with the post independence public housing drive reaching its 50th year in 2010.
- In 2009 Green Mark registered buildings accounted for 210 million sq metres of existing floor space.
- There are around 480 green buildings making up 8% of the total building stock.

Europe has traditionally been a leader in the effort to curb global climate.

# EUROPE

The European region differs from others due to the fact that the nations within it are closely linked both politically and economically. Most European countries are members of the European Union and many share a common currency. Europe has a Parliament and Commission which sets legislation and manages the needs of the Union as a whole. This also means Europe has a strong, co-ordinated position in international discussions and negotiations.

Despite the credit crunch, there remains a clear focus on tackling climate change and addressing sustainability. Many countries such as the UK and Spain are looking to reinvigorate their economies through the creation of green jobs and skills.

However, the economic crisis is still affecting people and business. Unemployment is rising, the number of job vacancies is still falling and companies continue to announce substantial job reductions across several sectors, often with the most vulnerable parts of the labour force being the worst affected.<sup>26</sup>

There are also key environmental issues to be tackled, with climate change, water and biodiversity all continuing to be areas of concern. Europe has traditionally been a leader in the effort to curb global climate change and this was demonstrated by the EU's pledge to reduce carbon emissions between 20-30% by 2020. However, while this leadership is to be applauded, it is vital the region moves beyond the rhetoric and starts to ensure that these targets will be met.

<sup>26</sup> Mainstreaming sustainable development into EU policies: 2009 Review of the European Union Strategy for Sustainable Development

**“Buildings are responsible for 40% of total energy use and for 28% of gas emissions. In order to reduce the energy use and to increase energy efficiency in this sector, the EU has taken measures in order to guarantee better building designs and a more efficient use of lighting, heating, cooling and hot water fixtures. The EPBD states that after 2020, all new buildings should be built in such a manner that their use of energy should be close to zero and that most of the energy used should come from renewable sources. This is why it is very important that until 2020 all the Member States should develop policies and programs that would encourage investments in new building materials and technologies that will allow the increase of energy efficiency in buildings. The investments that are going to be made in order to increase energy efficiency in buildings and the ones made in producing energy from renewable sources are going to have an effect on the reduction of energy and utility bills paid by the European citizens. These reductions could generate, until 2030, approximately 2.7 million workplaces at the EU level. This is why the public sector should assume a leadership role in promoting eco-efficient buildings.”**

Adriana Ticau, Member of European Parliament

France has been affected by the financial crisis like most European countries. Improving the availability of social housing is a particular challenge while reducing the unemployment rate (which was nearly 10% in April 2010)<sup>27</sup> is also a major concern.

The construction and property sector is important to the French economy and there is recognition that buildings offer good potential to reduce carbon emissions and levels of water and energy consumption. Building retrofits - refurbishment of the existing stock - is the key priority.

The challenge is to identify the right mix of policies for different property types, which will encourage owners or occupiers to make the necessary investment in light of long payback periods. Government is using a combination of tax incentives, and subsidies for renewables and eco-loans are available. A regulatory framework to oblige private owners to take action is also being considered.

In the commercial sector, risk assessment is starting to take energy performance into account and as the first green leases are signed, it's clear that sustainability is infiltrating the sector. But it is probably public procurement, which makes a significant proportion of building demand - that is leading the way on more sustainable practices.

Government is sending a clear policy signal for the whole of the industry. By 2020, all new buildings will need to be 'energy positive', meaning that they will need to produce more energy than they consume.

<sup>27</sup> [http://ec.europa.eu/employment\\_social/esf/docs/fr\\_country\\_profile\\_en.pdf](http://ec.europa.eu/employment_social/esf/docs/fr_country_profile_en.pdf)

<sup>28</sup> Plan Bâtiment Grenelle: Rapport d'Activité 2009.

<sup>29</sup> Ibid.

<sup>30</sup> <http://www.plan-batiment.legrenelle-environnement.fr/index.php/g-presentation-du-plan/le-plan-en-chiffres>



### France Green Building Council

- France GBC is an association that includes many of the key stakeholders in France's building sector (Associations Effinergie, HQE, QUALITEL, Résobat, IFPEB, CSTB, AFNOR Group, supported by the governmental Plan Bâtiment Grenelle)
- The organizations involved signed a Memorandum of Understanding (MoU) in November 2009 and recently settled France GBC, describing the anticipated activities.
- The Association HQE (High Environmental Quality Association) and the certification bodies of QUALITEL and CSTB (Scientific and Technical Centre for Buildings) have developed the HQE® certifications and its 14 target areas for assessing the overall environmental performance of buildings. More than 150 000 dwellings are registering for certification every year.

### BUILDING STATISTICS

- France's building sector consumes 43% of the country's total energy, is the largest consumer of energy in the country, and is responsible for 23% (123 million tons) of the country's CO<sub>2</sub> emissions.<sup>28</sup>
- Over 75,500 zero-interest home renovation loans (for improving overall energy efficiency) were given in the first 8 months of the program, with over 400,000 expected to be given per year by 2013.<sup>29</sup>
- In 2009, there were over 4 million people employed in the building sector and there are over 300,000 businesses and organizations operating in this sector.<sup>30</sup>



Credit: [www.istockphoto.com](http://www.istockphoto.com)

EUROPE  
FRANCE

# EUROPE GERMANY



Sahna Industrial Building, DGNB Gold, Großharthau - Schmiedefeld.

Many of the social and economic priorities in Germany are closely linked to the environment, such as improving energy security and resource efficiency. Germany is seen as one of the environmental leaders in Europe and key goals include strengthening water infrastructure, improving waste management, phasing out nuclear energy, encouraging the use of renewables and discouraging the use of environmentally harmful construction materials.

The German government has undertaken an ambitious project to develop an environmental code, designed to harmonize and integrate all environmental law in Germany. A comprehensive Environmental Code would play a key role in cutting red tape and promoting investment, which is hoped will have an important economic impact as well as environmental.<sup>31</sup>

An ecological tax which was introduced in 2003 is due to be reformed. The tax was introduced so that prices reflect the true economic cost of energy use, and the revenue created could promote employment by reducing the cost of labor. Improvements are to be made to the reform so as to alleviate tax burdens on businesses and implement a longer more comprehensive energy tax which reflects fuel and energy use more fairly.<sup>32</sup>

Both government and the private sector have shown a keen interest in the potential of the building sector in terms of climate change mitigation and both offer a number of incentives to encourage the uptake of sustainable building practices:

- The KfW-Förderbank offers funding for "energy-efficient building" in the form of low interest loans
- There are incentives offered in the 16 German states (Länder) municipalities. These mainly consist of low-interest loans designed to give young couples and families with a limited budget the chance to build their own house.

- The Federal Office of Economics and Export Control (BAFA) provides a grant to people installing modern technology for using renewable energy such as a solar or heat pump.

## BUILDING STATISTICS

- Domestic buildings account for 15% of GHG emissions with non-domestic buildings adding 30-40%.
- There are around 140,000 domestic and around 110,000 non-domestic new builds per year.
- In the non-domestic sector there are 86 DGNB pre-certified buildings and 33 DGNB certified buildings.



**DGNB**

Deutsche Gesellschaft für nachhaltiges Bauen e.V.  
German Sustainable Building Council

### Germany GBC (DGNB)

- Established in 2007
- DGNB has around 900 members from across the building industry.
- The focus of the DGNB is on awarding the certification for sustainable building.
- The Council uses its own DGNB certification tool. As a meritocratic rating system, it covers all relevant topics of sustainable construction. Outstanding buildings are awarded the categories bronze, silver, or gold.

<sup>31</sup> German Government Environment Website, <http://www.umweltbundesamt.de/umweltrecht-e/umweltgesetzbuch.htm>

<sup>32</sup> Kohlhaas, Michael, "Ecological Tax Reform in Germany, From Theory to Policy," *AICGS Economic Studies Program Report*.

Currently, Romania's GHG emissions are 40% below 1989 levels due to the collapse of industry after Communism and therefore the country is in compliance with the EU climate change agreements and the Kyoto Protocol at the global level.

Because of this, Romania is one of the few EU countries that is allowed to increase emissions from buildings, called a "positive target", of plus 19% by 2020. However, not exceeding that target by 2020 could become a challenge if the construction sector returns to the significant growth rates seen before the recession, without concurrent improvements in building energy and environmental performance.

Perhaps understandably given the lack of immediate pressure to reduce emissions, there has been little focus on reducing the carbon footprint of the construction sector. But that may be set to change. The twin social concerns of affordable housing and fuel poverty are major priorities in Romania and this provides an opportunity to reduce carbon at the same time.

## BUILDING STATISTICS

- The domestic sector accounts for 16% GHG emissions in the energy sector, but the CO<sub>2</sub> emissions from non-domestic buildings are not yet being evaluated.
- The current building stock accounts for 14% of Romania's total GHG emissions which is calculated based on the energy consumption.
- Until the global financial crisis in 2008, the volume of new construction was increasing year on year, with demand outstripping supply. After the 2008 financial crisis, the sector experienced significant decreases, with a 10-17% drop in output between 2008 and 2010.



ROMANIA  
GREEN  
BUILDING  
COUNCIL

### Romania Green Building Council

- Formed in 2008
- RoGBC has grown considerably and now has a diverse membership base consisting of 92 companies.
- Creation of the first **Green Building Innovation Center** in Romania (GBIC).
- Creation of the **Romania Green Building Professional Certification and Training Program**, to ensure cross-training between different disciplines and a more integrated design approach in delivering successful green building projects.

<sup>33</sup> Cost of electricity, gas, water and general building up keep.

*City Business Center, Timisoara,  
ModaTim Investment.*



EUROPE  
ROMANIA

## FOCUS

### Romanian Government Subsidies

Thermal energy has been heavily subsidised until recently but now, due to the recession, the government has had to cut those subsidies. These cutbacks have not been felt immediately because they were made in the summer, but during the winter, when the use and cost of energy will at least double, the affect on the population will be significant.

Even with the subsidised price, many Romanian families were allocating a large part of their monthly budget to the administrative<sup>33</sup> costs of running their buildings. Removal of the subsidies means that a lot of families will simply have difficulty paying their bills. However, there are options available that could improve the situation. There are major opportunities for thermal improvements in the form of refurbishment, something that many people are interested in as they look for ways to reduce their energy costs for the rapidly approaching winter season.

While there are no formal government incentives offered for green building projects specifically, recently the Government has put together plans for a "bank loan guaranteed by the state" for the owners that want to thermally improve their buildings from private funds, bypassing the complicated grant system.

Despite the fact that in 2010 the number of new construction projects planned is low compared to past years, where developers are considering investing they are increasingly looking at the green building model. The focus is on delivering highly energy efficient buildings but also

on creating a competitive advantage in a market where demand has decreased significantly but where end-users are more aware about the benefits of a high quality, energy efficient building. One of the first major commercial office projects in the country to better integrate environmental concerns is the City Business Centre from Timisoara, developed by ModaTim Investment SA, which won the Green Building Project of the Year Award for 2009. The centrally located site is being transformed into a modern office/services environment, in line with the urban plans of the city. As well as offering environmental benefits, the project has triggered a full urban regeneration of the area, and the occupiers benefit from a comfortable work environment, enhancing creativity, dedication and team spirit.

RoGBC has been promoting the benefits of green buildings in the private sector, and also established a dialogue with public authorities in Romania to create a regulatory framework that fosters the development of a sustainable built environment. These include:

- Lobbying for a green finance programme, supported by the government, for thermal rehabilitation projects, and a set of local measures that could be adopted by the local public authorities (including expedited permitting, density bonuses and local tax reductions) to incentivize green building.
- Promoting 'green mortgages' as a new financial product that could boost the development of green buildings in Romania. RoGBC is in discussion with several banks to create and implement this new product.

Spain has been focussed on overcoming the effects of the financial crisis, which has hit the Spanish economy hard, with an impact on employment and households. But despite this pressing challenge, a consensus has emerged that this also provides an opportunity to address sustainability.



#### **Spain Green Building Council (GBC España)**

- Established in 2010
- 140 members
- Receives 20% of its funds from the Ministry of Housing.
- Rating tool: VERDE

#### **BUILDING STATISTICS**

- New construction reached its peak in 2007 and contracted rapidly following the financial crisis.
- 17% of Spain's GDP was based in construction with the government, public and private companies all involved. When the housing market crashed there was an excess of 2,000,000 empty dwellings, most of which could not be paid for.
- In 2007 there was a stock of around 24 million dwellings, 17 million of which were over 20 years old. These buildings fell under the 1979 building code that had few green measures in its makeup.

#### **FOCUS**

##### **Law of Sustainable Economy**

In November of last year the Spanish government passed the 'Law of Sustainable Economy' in an effort to re-evaluate the way that the country's economy works. It is based on saving energy, the promotion of renewable energy, quality education, reform of the financial system, investment in research and development in both the public and private sectors, and in the area of town planning.

A consensus has emerged that green building can provide part of the solution to the economic and employment problems through the refurbishment and retrofitting of buildings and urban areas. The move towards a more sustainable built environment will lead to employment generation, economic reactivation, reduction of energy dependence and provide the bonus of environmental benefits. This is supported by the Ministry of Science and Innovation, which is providing research funding to shift the country's economic model towards a more sustainable one.

The Ministry of Industry, Commerce and Tourism has developed the E4 Strategy for energy efficiency, which focuses on introducing best practice incentives managed through the IDAE (*Instituto para la Diversificación y Ahorro de la Energía* - Spanish Institute for Energy Diversification and Savings) and the regional energy institutions. The Ministry of Housing has also established new requirements for buildings including energy labelling through the Spanish building code in order to comply with the European Union's Energy Performance of Buildings Directive (EPBD). This also provides incentives for building with high ratings.

**EUROPE**  
**SPAIN**

# EUROPE TURKEY

Like many European countries, affordable housing and urban infrastructure are priority areas for Turkey. In terms of the environment there are concerns over site selection, energy performance, water pollution, air pollution, waste management and loss of biodiversity. Many densely populated parts of the country are prone to earthquakes, with outdated construction techniques further compounding the potential damage that could be caused. Following the Izmit quakes in 1999 earthquake safety has been placed firmly on the Turkish political agenda.

Recently the government passed an Energy Performance in Buildings Directive in line with EU regulations. The government is not currently offering any incentives for green building, however, green building concepts and incentives are among the short term plans of the Turkish Ministry for Environment and Forests. Further regulations dealing with energy efficiency and renewable energy are also expected from the government.

## BUILDING STATISTICS

- There are 15,000 new builds per year
- There are currently 6 green rated buildings

*Gordion Shopping Center in Ankara, BREEAM "Very Good" Certification.*



çedbik

## Turkish Green Building Council (ÇEDBİK)

- Formed in October 2007, now with 80 company members and 10 individual members.
- ÇEDBİK is working on adapting the BREEAM certification to Turkey and also provides trainings on LEED and DGNB. In total, there are 6 green certified buildings in Turkey.
- ÇEDBİK is working with a member bank to incentivise green buildings and is working with various partners, including WWF, on exemplar green building projects including the retrofitting of a historical wooden structure in a nature reserve in the Blacksea region.
- ÇEDBİK organizes seminars/conferences on green buildings, including a 3 day conference to coincide with World Green Building Week, during which it will be organizing BREEAM and LEED trainings.
- ÇEDBİK is publishing a new magazine, EkoYapı (Eco- Construction) to promote green buildings in Turkey.

It is difficult to overstate the impact of the global recession on the building and property sector in the UK. Industry analysts estimate that since 2008 there has been a 13% fall in the number of people working in the sector, which equates to a loss of over 300,000<sup>34</sup> jobs. Furthermore, the Government is set to cut many public sector building projects and with private sector investment dwindling, the outlook for the industry remains unclear. However, despite this, it is encouraging that sustainability has maintained a very high profile in the sector.

It is likely that the impact of climate change will be felt across the UK with winters predicted to become milder, summers hotter and drier, weather extremes becoming more unpredictable and sea levels continuing to rise.<sup>35</sup> Furthermore, the UK also faces challenges in terms of rising fuel prices, fuel poverty, high levels of unemployment and increasing energy insecurity.<sup>36</sup>

As well as offering the potential for dramatic cuts in GHG emissions, green building practices can also help to overcome some of the socio-economic challenges we face in the UK. For example, green refurbishment of existing buildings could have a significant positive impact on the UK job market. Estimates suggest that up to 200,000 jobs could be created within the residential sector alone<sup>37</sup>, with a further 75,000 possible jobs in the non-domestic sector.<sup>38</sup>

The previous Labour Government was the first in the world to enshrine carbon reduction targets in legislation, with the introduction of the **Climate Change Act** in 2008, and the introduction of 5 year 'Carbon Budgets'. The UK has seen a change in government to a Conservative-Liberal Democrat Coalition following the May 2010 elections. However, the prioritisation of green issues and sustainability has remained, with the new Government aiming to be the 'greenest ever'.<sup>39</sup>

The 'zero carbon' policy, introduced by the previous administration, and supported by the Coalition, has had a huge impact on the house building industry in the UK. In 2006, for the first time, the Government set out a clear target for the carbon standard that the UK's new homes would be required to meet from 2016, and the industry has responded with early innovation and solutions. In 2008, a UK-GBC Task Group recommended that the Government should set a similar target for all 'non-domestic' buildings to be zero carbon by 2019. The Government has adopted this target and is now working on defining zero carbon for this sector.



#### The UK Green Building Council (UK-GBC)

- The UK-GBC was founded in 2007 and has 330 members from across the property and construction sector.

<sup>34</sup> "Sector job cuts in recession top 300,000,"

*Construction News*, 22/07/2010

<sup>35</sup> [http://www.ukcip.org.uk/index.php?option=com\\_content&task=view&id=237&Itemid=331](http://www.ukcip.org.uk/index.php?option=com_content&task=view&id=237&Itemid=331)

<sup>36</sup> [http://www.decc.gov.uk/en/content/cms/what\\_we\\_do/change\\_energy/int\\_energy/security/security.aspx,24/07/2010](http://www.decc.gov.uk/en/content/cms/what_we_do/change_energy/int_energy/security/security.aspx,24/07/2010)

<sup>37</sup> [http://www.existinghomesalliance.org/media/ExHA%20Finance%20Paper\\_%20Paying%20for%20it%20v4%20FINAL.pdf](http://www.existinghomesalliance.org/media/ExHA%20Finance%20Paper_%20Paying%20for%20it%20v4%20FINAL.pdf)

<sup>38</sup> [http://www.calebgroup.net/resources/documents/01CALEBNON-DOMESTICREFURBISHMENTREPORT-26Feb09\\_000.pdf](http://www.calebgroup.net/resources/documents/01CALEBNON-DOMESTICREFURBISHMENTREPORT-26Feb09_000.pdf)

<sup>39</sup> <http://www2.defra.gov.uk/2010/07/22/arms-length-bodies/>

<sup>40</sup> <http://www.statistics.gov.uk/cci/nugget.asp?id=151>

EUROPE  
UNITED KINGDOM

## FOCUS

### Pay As You Save (PAYS)

Low carbon refurbishment is a high priority in the UK due to the number of old, leaky buildings, rising energy costs and the high incidence of 'fuel poverty', especially amongst elderly and vulnerable households. Households are classed as being in fuel poverty if they spend 10% or more of their income on fuel bills, and one in four households fall into this category in the UK.

Refurbishing existing buildings to high environmental standards can help address these issues. It makes sense financially, since the measures pay for themselves over their lifetime through reduced bills; socially as more efficient homes can prevent fuel poverty and create healthier buildings; and environmentally by cutting emissions and water use for example. However, one of the key barriers to carrying out low carbon refurbishment often cited by consumers and businesses is the up-front cost of the measures needed.

The UK-GBC has been promoting the possibility of a new form of financing for

low carbon refurbishment of buildings for sometime through the so-called 'Pay As You Save' (PAYS) scheme. PAYS is a policy proposal designed to tackle the high upfront cost of refurbishment, by spreading the cost over a long period, paid back through savings in energy bills. PAYS could have a major impact on making mainstream low carbon refurbishment a reality, by bringing the upfront cost of refurbishment down to zero, while providing month on month savings for occupiers, including householders and business, on energy bills, even after a form of standing charge has been paid on the property.

The PAYS approach, first suggested by a UK-GBC Task Group, is now being taken forward in the Coalition Government's 'Green Deal' and is expected to be in place by 2012. This policy was launched in April 2009 by the now Chancellor George Osborne at a UK-GBC event in London. 'PAYS Pilots' are also underway to test the scheme across the country.

## BUILDING STATISTICS

- Around 43% of total UK emissions come from buildings: 17% from non-domestic buildings, 26% from homes
- In 2008, the household sector accounted for 36.9% of energy use <sup>40</sup>
- CO<sub>2</sub> emissions per household = 5.99 tCO<sub>2</sub>

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WORLD GREEN BUILDING COUNCIL

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## THE WORLD GREEN BUILDING COUNCIL

WorldGBC is a network of national Green Building Councils from around the world, making it the largest international organization influencing the green building marketplace.

Our mission is to be the global voice for Green Building Councils and to facilitate the global transformation of the building industry towards sustainability.

We foster and support new and emerging Green Building Councils by providing them with the tools and strategies to establish strong organizations and leadership positions in their markets.

Once established, we work closely with councils to advance their common interests by promoting local green building actions as solutions to address global issues such as climate change.

By driving collaboration between international bodies and increasing the profile of the green building market, we work to ensure that green buildings are a part of any comprehensive strategy to deliver carbon emission reductions.

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