Buildings use about 40 percent of the energy produced in most countries (including the U.S. and the EU as a whole) and account for 70 percent of electricity use and 40 percent of CO_2 emissions. As key sources of greenhouse-gas emissions, buildings are thus a strategic component of numerous nations' and international organisations' climate change initiatives. Also, the economic and social importance of the construction sector is undisputed. Civil society's improved understanding of global warming mechanisms is forcing policy makers and industry to implement 'green' actions, within which energy efficient buildings have a role to play. However, focusing on this dimension of the Sustainable Development grand challenge does not tell the whole story. There are major differences between emergent and incumbent countries, new constructions and existing ones, residential and commercial uses. Indeed, buildings vary in their very characteristics according to culture, geography and building types. The vast range of stakeholders in the value chain (from local authorities to users, owners, designers and developers) and their complex interactions need to be considered too. This intrinsic complexity explains why innovation through mutually beneficial standards is required: these standards are attempts to achieve a greater degree of interaction and integration all along the chain, hence correcting systemic failures. *For the three drivers identified through the semantic analysis of the world press on innovation and green building standards, we suggest possible policy responses.*

Key drivers	***Matching policy shifts and reforms*** *by Pierre Bitard and Alain Quévreux, January 2009*
CUSTOMER PRESSURE FOR CLEAR TARGETS	• EU wide low CO2/zero energy requirements lay down concrete objectives and are set up for new buildings and major renovations. The EPBD (recast) requires enhanced building regulations and member states are encouraged to provide clear implementation schedules • The whole building industry will consequently be subject to a desired innovation pressure (cf. EuroACE or EBC) where price-reduction & increased productivity play a pivotal role in meeting the end-user demand
PUBLIC BUILDINGS LEADING THE WAY	• In line with the EC Lead-Market Initiative, the EC and the member states, after consultation with Industry, define a user-friendly calculation & benchmarking tool for assessing the sustainability performance of buildings: MS & EU administrations make use of it and communicate results • To encourage more active public sector involvement, a yearly European Prize could be launched to reward a public building for its excellence in both design and procurement, from across the public sector • The EC, with EIB, promotes initiatives such as "Building Schools for the Future" and Public/Private Partnership Investment Loans
FOCUS ON COMMUNITIES BEHAVIOURIAL CHANGES	• The EC, jointly with the IEA and IOS or other relevant bodies, raises awareness through communication on innovative approaches to shared problems with households and wider community organisations: - reporting on the state of the energy efficiency of the buildings in Europe, with traffic light type of indicators of progress towards the *Zero Net Energy vision* through a dedicated website - citizen opinion surveys on levels of satisfaction with EC actions in promoting green building standards • The EC, together with EIB, proposes conditional loans and incentives policies for sustainable/eco-cities

IDEAS FOR CHANGING EUROPE

A RESEARCHER'S THINKING

The successes of planning green designs using Building Information Modelling (BIM) have been so robust for the U.S. General Services Administration (GSA) that the next design guide will be an energy analysis and green building guide.

Understanding how BIM-based energy and thermal performance analysis can give feedback to designers and make our buildings more sustainable is a big push.

Peggy HO, *Stanford University Centre for Integrated Facility Engineering Visiting Fellow to GSA*

A BUSINESSMAN'S INTEREST

Many contractors do not opt for a green building as the initial investment would have to be upped by 20% to 30% compared to the normal buildings. This would be offset by the saving of almost 30% energy over a period of time.

A policy of certification and labelling of products needs to be brought into practice. Clients outsourcing project work need to ensure that construction companies adhere to environment norms.

A.K. MISHRA, *Tata Projects COO*

GRIPS Intelligence Corner

Green building standards: international cooperation needed

• **"Green" (or sustainable) building** *is the practice of designing, constructing, operating, maintaining, and removing buildings in ways that conserve natural resources and reduce their impact on climate change.*

• **Major "green" building standard**: *Most OECD countries have developed their own standards of energy efficiency for buildings. Amongst them, one industry-led standard is succeeding in exporting its rating system worldwide: the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Green Building Rating System.*

•**Upcoming**: *In the EU, 2009 should be the year of "The Energy Performance of Buildings Directive" (*EPBD*), since the first reading of the* ***EPBD recast*** *in Parliament plenary is expected on 1st April. This 2002 Directive came into effect in January 2006. It provides a common methodology for calculating the energy performance of buildings and for creating minimum standards of energy performance in individual member states. The directive applies to new buildings and to existing buildings subject to major renovations.*

POLICY SUPPORT ON THE MOVE

CALIFORNIA'S GREEN BUILDING CODE (July 17 , 2008)

CALIFORNIA TO LEAD BY EXAMPLE IN IMPROVING STATE-OWNED BUILDINGS ENVIRONMENTAL PERFORMANCE

The Green Building Initiative has committed California to implement sustainable practices in the facilities it owns, leases, retrofits or maintains. Through this, California will cut energy use, conserve resources, and reduce greenhouse gas emissions.

The Executive Order S-20-04 *calls for reducing electricity consumption in state buildings by 20 percent by 2015. Reaching that goal will involve a combination of benchmarking the energy efficiency of state buildings, and retro-commissioning and retrofitting facilities to ensure that energy systems are operated as efficiently as possible. As part of the Green Building Order, California is embracing the LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED) standards set by the U.S. Green Building Council.*

THE GREEN BUILDING CODE: AMBITIOUS TARGETS

The first of its kind in the US, the code sets targets for energy efficiency, water consumption, dual plumbing systems for potable and recyclable water, diversion of construction waste from landfills and use of environmentally sensitive materials in construction and design, including eco-friendly flooring, carpeting, paint, coatings, thermal insulation and acoustical wall and ceiling panels.

Adopted by the California Building Standard Commission on July 17, 2008, the code will be voluntary when it takes effect 1 July 2009. Mandatory standards will start by 2011. The main objectives are: reduction of total water usage by 20%, of energy consumption by 15% and of water for landscaping by 50% (from current standard levels).

BUSINESS GROUPS APPLAUD, ENVIRONMENTAL GROUPS DEPLORE

The building code changes have won nearly universal acclaim (e.g. California Chamber of Commerce, California Manufacturers and Technology Association). "The adoption of these regulations will create a sound framework from which to locus future regulatory efforts, because it is important that INNOVATIONS IN GREEN BUILDING are not sabotaged by state mandates." (Alan Zaremberg, President of the California Chamber of Commerce)

However, some state lawmakers and the Natural Resources Defense Council deplore that the code's standards do not reach the LEED certification authorised for all new state-owned buildings.