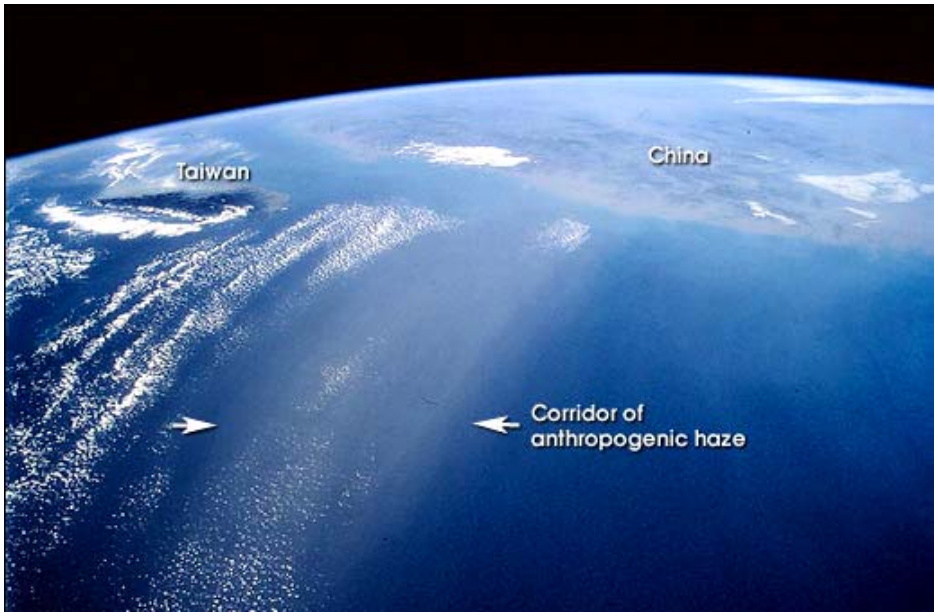
10th-13th May 2010 - 'The Lowry', Manchester, England

CIB World Building Congress: 'Building a Better World'

Anthropogenic Haze 

East China Sea (1996)

The Critical Link between Sustainable Development & Climate Change

Sustainable Climate Adaptation

www.cjwalsh.ie

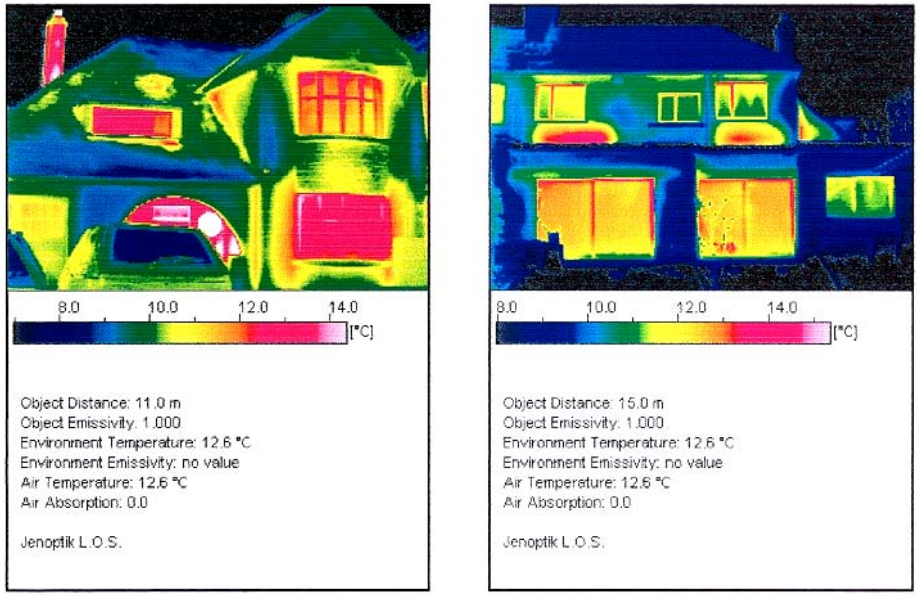
21st Century Design Agenda

- UNFCCC & Other International/Regional Instruments
  Ozone Depletion - **Climate Change** - POP's - Biodiversity - EIA - SEA
  [Are the Planning, Architectural & Engineering Communities proactive ?]
- NIST(USA) Final Reports on 2001 WTC 9-11 Incident in New York
- UN 2006 Convention on the Rights of Persons with Disabilities
  Preamble (g): "Emphasizing the importance of mainstreaming disability issues as an integral part of relevant strategies of sustainable development, ..."
  Article 9: Built Environment Accessibility **Article 11:** Situations of Risk
- Sustainability Impact Assessment (SIA)
  All Levels of Decision Making, Implementation & Operation ...
  A continual evaluation and optimization assessment - informing initial decision-making, or design, and shaping activity/product/service realization, useful life and termination, or final disposal - of the interrelated positive and negative social, economic, environmental, institutional, political and legal impacts on balanced and equitable implementation of **Sustainable Human & Social Development**.

Monitoring 'Real' Construction

- Quantitative & Qualitative Performance Indicators
- Built-In & Portable Monitoring Equipment

e.g. Energy Efficiency in Ireland (1998) ... Conservation & Replenishment (2008)



Energy Survey using Long Wave Infra-Red Thermography 8-12 microns

Eastern Sichuan, China  After 12 May 2008

Independent Technical Control

NIST urges state and local agencies **to rigorously enforce** building codes and standards since such enforcement is critical to ensure the expected level of safety. Unless they are complied with, the best codes and standards cannot protect occupants, emergency responders, or buildings.

[Executive Summary, 2005 NIST Final Report on 9-11 WTC Towers 1 & 2 Collapses]

Sustainable Climate Adaptation

♦ Is Reliability-Based

♦ Is Person-Centred

That design process which places 'real' people at the centre of creative endeavours and gives due consideration to their responsible needs, and their health, safety, welfare and security in the **Human Environment**.

Sustainability... fundamentally transforms Climate Adaptation Design & Implementation

Sustainable Design Solutions ... must be appropriate to **Local** Geography, Social Need, Climate/Future Changes, Economy, Culture and Language(s)/Dialect(s) ...

What is Sustainable Development ?

World **C**ommission on **E**nvironment & **D**evelopment
1987 Report: 'Our Common Future' - Chapter 2, Paragraph 1

#1. Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- the ***concept of 'needs'***, in particular the essential needs of the world's poor, to which overriding priority should be given; and
- the ***idea of limitations*** imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

⇩

1992 UN Rio Declaration on Environment & Development
[1992 United Nations Framework Convention on Climate Change + 1997 Kyoto Protocol]

⇧

1972 UN Stockholm Declaration on the Human Environment

What is Sustainable Development ?

World **C**ommission on **E**nvironment & **D**evelopment
1987 Report: 'Our Common Future' - Chapter 2, Paragraphs 2 & 4

#2. Thus, the goals of economic and social development must be defined in terms of sustainability in all countries - developed or developing, market-oriented or centrally planned. Interpretations will vary, but must share certain general features and must flow from a ***consensus*** on the basic concept of sustainable development and on a ***broad strategic framework*** for achieving it.

#4. ... The essential needs ... of people in developing countries - for food, clothing, shelter, jobs - are not being met, and beyond ... these people have legitimate aspirations for an improved quality of life. ... Sustainable development requires meeting the ***basic needs of all*** and ***extending to all the opportunity*** to satisfy their aspirations for a better life.

Sustainable Human & Social Development

Sustainable **D**esign **I**nternational

2004 Rio de Janeiro Declaration on Sustainable Social Development, Disability & Ageing

Development which meets the responsible needs, i.e. the Human & Social Rights*, of this generation - without stealing the life and living resources from future generations, especially our children
... and their children ... and the next five generations of children.

***As defined in the **1948 Universal Declaration of Human Rights**

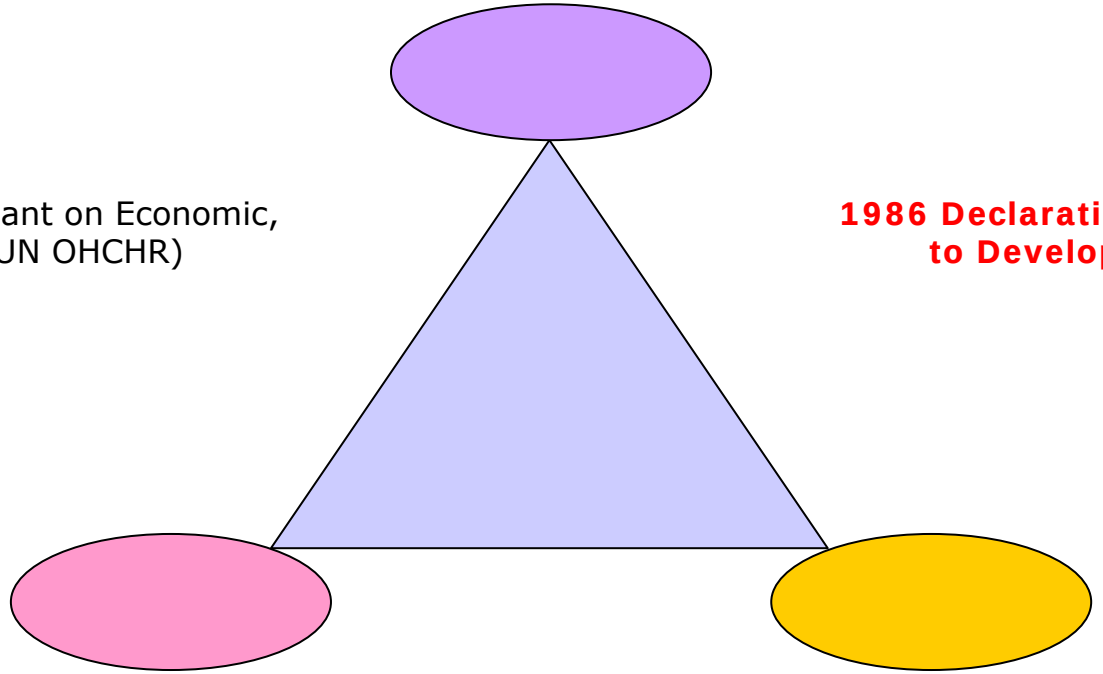
Our **Ultimate Goal** must be to achieve a dynamic and harmonious balance between a Sustainable 'Human' Environment and a flourishing, not just a surviving, 'Natural' Environment ... with the **Overall Aim** of achieving Social Wellbeing for All.

Social Wellbeing

A general condition - in a community, society or culture - of health, happiness, creativity, responsible fulfilment, and sustainable development.

1948 Universal Declaration of Human Rights (UN OHCHR)

1966 International Covenant on Economic, Social & Cultural Rights (UN OHCHR)



1986 Declaration on the Right to Development (UN OHCHR)

2001 Universal Declaration on Cultural Diversity (UNESCO)

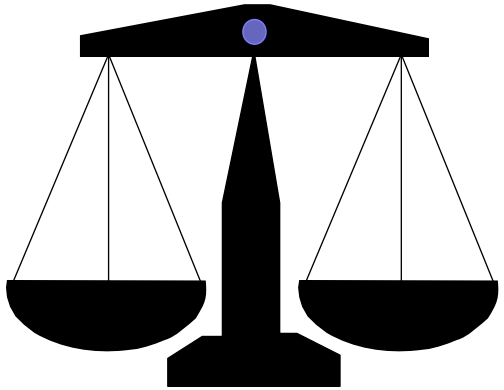
2006 Convention on the Rights of Persons with Disabilities (UN)

Many Aspects to Sustainable Development

Social + **Economic** + **Environmental** + **Institutional**
[Social Organization]

+ **Political** + **Legal** + **Judicial** ....

in an agreed context of International Law & Lasting Peace



Balanced, Fair & Equitable Implementation is a Fundamental Value & Principle !!

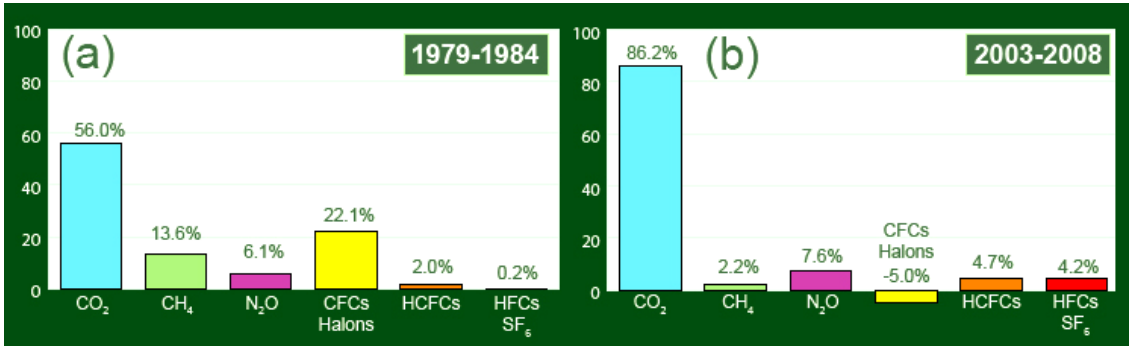
2008 G-77 Statement to U.N. General Assembly

A strong global consensus in favour of immediate and concerted action on climate change was forged at the **2007 UNFCCC Bali Climate Summit** ... resulted in a sharply worded **Bali Action Plan** ... and a **Timetable**.

Just a few weeks later, on **12th February 2008**, in New York ... Ambassador John Ashe, Permanent Representative of Antigua & Barbuda to the United Nations, delivered an important Statement to the U.N. General Assembly ... on behalf of the Group of 77 & China (comprising 130 countries) ...

"Climate Change as a Sustainable Development Challenge

- It is imperative that our discussion reinforces the promotion of sustainable development ...
- We must take fully into account that poverty eradication, economic and social development are the paramount priorities of Developing Countries ..."

WMO GHG Bulletin No. 

5: 23 November 2009

2009 UNFCCC Copenhagen Climate Summit

Disorganized - Chaotic - Divisive ... Europe sidelined ! ... USA thrown a last minute lifeline by BASIC Countries ... No legally binding Post-2012 Protocol in short-term !

2009 Copenhagen Accord

Voluntary Emissions Targets being undertaken by Developed Countries (Appendix I):

- Highly conditional on the performance of other countries ;
- Very disappointing, being far below what is required to cap the planetary temperature rise at 1.5 degrees Celsius ; and
- No consistent emission base year ... varying from 1990 and 1992, up to 2000 and 2005. [1990 - Convention Article 2 & Kyoto Protocol Articles 3, 25]

Historical Responsibilities ?

To Mitigate or Adapt ?

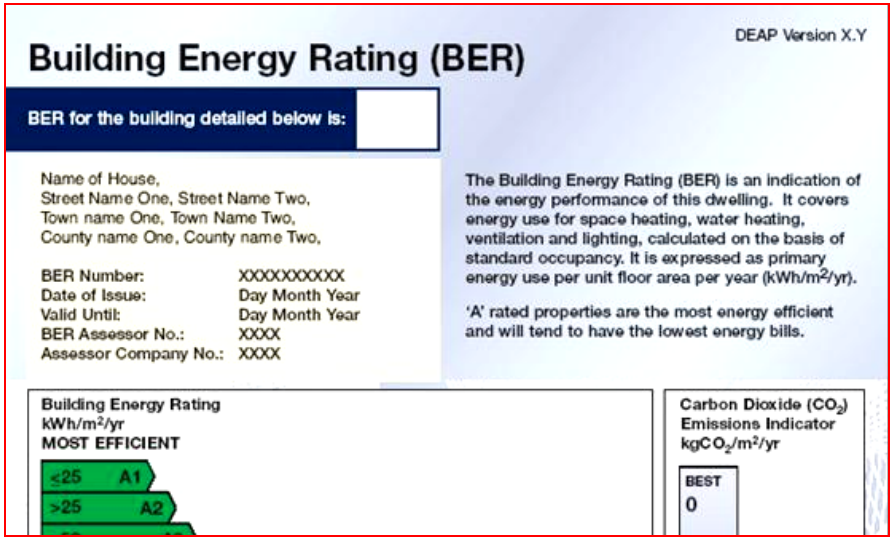
[**1997 Kyoto Protocol Annex A - GHG's:** CO_2 ; CH_4 ; N_2O ; HFC's ; PFC's ; SF_6]

European Union: Directive 2002/91/EC of the European Parliament and of the Council, of 16th December 2002, on the Energy Performance of Buildings

Ireland: Statutory Instrument No. 666 of 2006
European Communities (Energy Performance of Buildings) Regulations 2006

≈ 70 %
Non-Compliance with Building Regulations

SF_6 ?
Sulphur Hexafluoride



Computer Software ?
Paper Estimation

CO_2
Mitigate Emissions

? Adapt to Rapidly Dwindling Supplies of Climate-Damaging Fossil Fuels ?

Proactive Climate Change Adaptation

[**Minimum Life Cycle** for a **Sustainable Building** is **100 Years**]

- **Incremental Building Improvements** ... tied to weak, legally binding international mitigation agreements ? ... cost competitiveness of the developed economies ? ... flexibility mechanisms in UNFCCC process ?
- adopt 100 yr. perspective ... **Radical Adaptation Measures** ... NOW !

Generally ... **Climate Change Adaptation** ... encompasses urgent and immediate short, near and long-term actions at local, national, regional and international levels to reduce the vulnerability and strengthen the resilience of the Human Environment, including ecological and social systems, institutions and economic sectors ... to present and future adverse effects of climate change and the impacts of response measure implementation ... in order to minimize the local threats to life, human health, livelihoods, food security, assets, amenities, ecosystems and sustainable development.

Built Environment Climate Change Adaptation ... means reliably implementing policies, practices, projects and institutional reforms in the Built Environment ... with the aim of reducing the adverse impacts and/or realizing the benefits directly/indirectly associated with climate change, including variability and extremes ... in a manner which is compatible with Sustainable Human and Social Development.

Sustainable Residential Buildings

- **Minimum Life Cycle of 100 Years** ... **Structurally Robust** ;
- are shown to be Fit for Their Intended Use, in the Location of Use ... CE Marking ;
- **Intelligent**, Electronically Mature and facilitate Remote Building Management ;
- are **Flexible** and **Adaptable** with regard to internal layout, and **Accessible** for people with activity limitations ;
- are **Super Energy-Efficient**, with negligible thermal bridging and accidental air seepage ... encourage users, by design, to **Conserve & Replenish Energy** ;
- offer a high level of **Indoor Air Quality (IAQ)** ... protection from Natural Radon ;
- have a substantial component of **Renewable Energy & Heat Technologies** ... sufficient to return a multiple of the building's energy consumption to an Intelligent Regional/District Grid (**Positive Energy Buildings**) ... and incorporate **Recycling, Rainwater Re-Use & Waste Management Technologies** ;
- contain, as standard, a Monitored Fire/Smoke/Heat Detection System and a Sprinkler/Mist Suppression System ... protection from Carbon Monoxide ;
- are set in **Sustainable Landscaping** ... sustainable drainage ... a considered relationship between exterior and interior ; and
- are Competently Built and Reliably Completed to project programme and cost plan ... **'Real' Performance-in-Use Tested & Monitored**.

Prolonging Building Life Cycle

Flexibility

The extent to which a building interior is designed, when new, to be capable of being easily modified at any later stage during the life cycle of that building - with minimal cost and user inconvenience - because of a person's changing living or working needs.

Adaptability

The extent to which a building, or a building component, is designed when new, or capable of being easily modified at any later stage, to meet the changing life and living needs of the broad range of potential users, who may or may not have activity limitations or develop a health condition during the life cycle of that building or component.

Accessibility for All Users

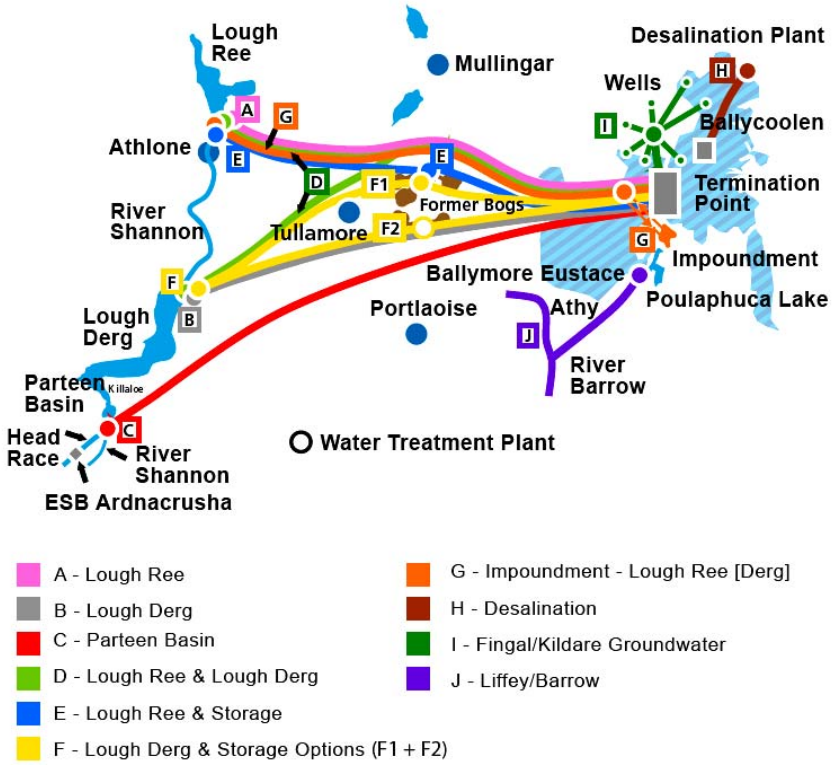
Ease of independent approach, entry, evacuation and/or use of a Building and its services and facilities, by all of the building's potential users **-** with an assurance of Individual Health, Safety and Welfare during the course of those activities.

Redundancy of Structure & Systems

'Lean Construction' is an outdated Green Concept - Not a Concept related to Sustainability !

Empire State Building (NY), 79th Floor After B-25 Plane Crash, 28 July 1945

Sustainability of Adaptation Projects ?



Proposed Dublin City Region Water Supply Project

[Cost approximately **€600 Million** ... will consume **Valuable Resources** ... **Damaging Environment Impact**]

Sustainability of This Adaptation Project ?

1. Since the 1960's ... a dysfunctional and corrupt Spatial Planning System in the Dublin City Region has actively encouraged an uncontrolled horizontal 'sprawl'.
2. There are still no residential water charges in Dublin.
3. There is an enormous leakage rate from the public water distribution system.
4. Water supplied to houses in the Dublin City Region is not yet metered.
5. There are no requirements in Ireland's Building Regulations to re-use rainwater.
6. The existing foul and storm water drainage infrastructure in the City Region is overstretched and overloaded.
7. Sustainability Impact Assessment (SIA) is not yet a standard procedure, at any level, within the many national, regional and local AHJ's involved.

The most glaring flaw in this project ... there is no comprehension,
in the minds of policy and decision-makers,
that water is a limited resource !

New CIB W108 Report : 2010

'Sustainable Climate Adaptation in the Built Environment'

Part I: International Synthesis & Harmonized CC Vocabulary

Part II: National Reports

Publication Target - Autumn 2010

Conclusions

The Link between Sustainable Human and Social Development and Climate Change in the Built Environment is **critical** for ...

- **Developing Countries** ... their paramount priorities have been clearly stated to be: 'poverty eradication, and economic and social development' ... specified as responsible needs (rights) in International Law ;
- **Developed Countries** ... acknowledging historical responsibilities, and recognizing the rights of Developing Countries ... will be key components in any future, legally binding Global Mitigation Agreement ... cap of 1.5 degrees Celsius on planetary temperature rise.

This Link is **essential** ...

National Adaptation Strategies, Programmes and Projects ... to be successfully implemented ... must be informed by the concept of Sustainable Development ... and, at all stages, filtered through the lens of **Sustainability Impact Assessment (SIA)**.