

Drivers for Sustainability in UAE Construction

Solving current environmental issues:

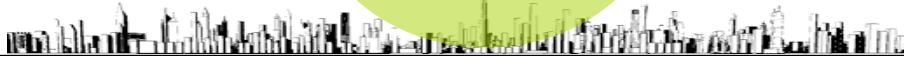
- Pressure on natural resources including land, construction materials, energy, and water
- Pollution from solid waste, wastewater treatment, air pollution (related to industry and transport)
- Biodiversity and protection of local species

Financial opportunities and benefits:

- Related to infrastructure
- Related to employee and worker productivity

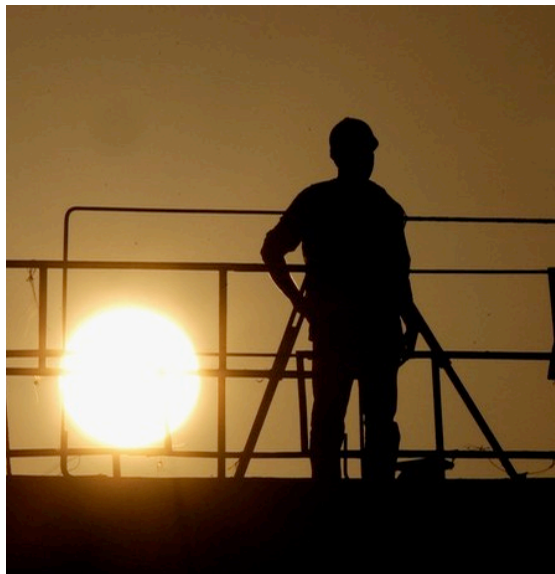
Leadership & marketing:

- Competitiveness between UAE emirates and cities, developers, companies...
- International role in the energy sector
- Attracting tenants, workers...



Sustainability in UAE Construction: Key Challenges

- Climatic conditions

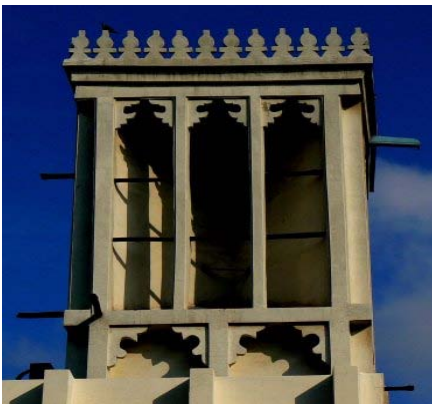


Location: Dubai International Airport
Sources of data: CIBSE Middle East Design Notes
Latitude: 25°15'N
Longitude: 55°20'E
Altitude: 8 m

Data	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature [°C]												
Average daily maximum	24	25	28	32	37	39	41	40	39	35	30	26
Average daily minimum	14	14	17	20	23	26	29	29	26	23	18	15
Average monthly maximum	29	31	34	40	44	46	47	45	43	39	34	29
Average monthly minimum	10	11	14	16	20	24	25	26	24	19	15	12
Average monthly	20	21	24	28	32	35	36	36	34	29	25	21
Absolute maximum	32	34	41	43	45	47	47	46	45	41	36	32
Absolute minimum	8	9	11	13	16	21	20	24	22	14	10	9
Relative Humidity [%]												
Average daily maximum	85	88	87	82	79	83	81	80	86	85	83	85
Average daily minimum	45	45	41	33	29	32	33	35	31	34	37	44
Rainfall [mm]												
Monthly average	11	35	24	9	1	0	0	1	0	0	1	6
Maximum in 24 hrs	24	51	36	33	11	0	0	1	0	0	4	14
Sunshine [hrs]												
Daily average	8	8	8	10	11	11	10	10	10	10	9	8

**Sustainability in UAE Construction:
Key Challenges**

- Cultural considerations



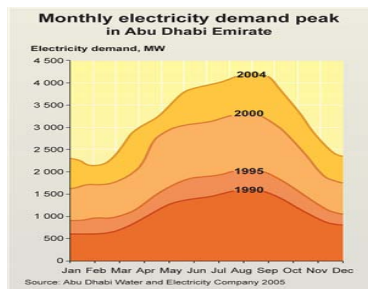
**Sustainability in UAE Construction:
Key Challenges**

- Resources (un)availability



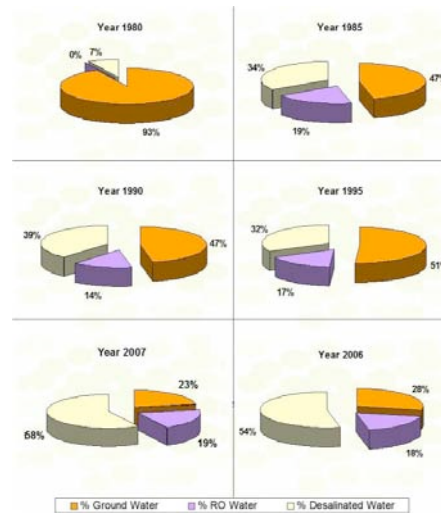
**Sustainability in UAE Construction:
Key Challenges**

- Resources (un)availability



"Demand for power in the GCC has surged by nine per cent. KSA and UAE require 2,000 and 1,500 additional megawatts annually during the coming decade to generate more power to cover the increasing needs"
Business 24-7, May 28, 2008

Water Production in Bahrain



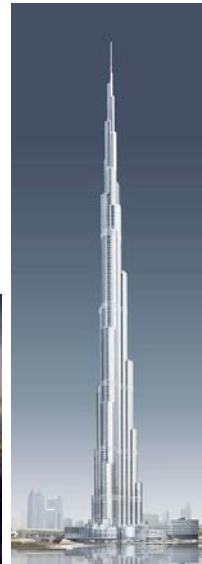
**Sustainability in UAE Construction:
Key Challenges**

- Demand for Luxury, Lushness, Waterfront location



**Sustainability in UAE Construction:
Key Challenges**

- Drive for uniqueness, challenging the limits



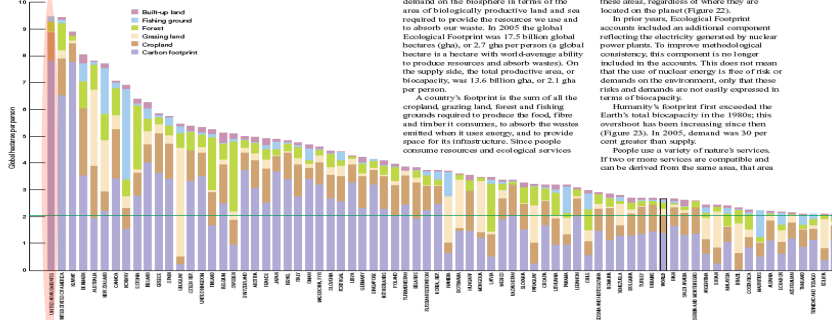
**Sustainability in UAE Construction:
Key Challenges**

- Resulting ecological footprint



ECOLOGICAL FOOTPRINT OF NATIONS

Fig. 22: ECOLOGICAL FOOTPRINT PER PERSON, BY COUNTRY, 2005



The Ecological Footprint measures humanity's demand on the biosphere in terms of the area of biologically productive land and sea required to provide the resources we use and to absorb our waste. In 2005 the global Ecological Footprint was 17.5 billion global hectares (gha), or 2.7 gha per person (a global hectare is a hectare with its world-average ability to produce resources and absorb wastes). On the supply side, the total productive area, or biocapacity, was 13.6 billion gha, or 2.1 gha per person.

A country's Footprint is the sum of all the cropland, grazing land, forest and fishing grounds required to produce the food, fibre and timber it consumes, to absorb the wastes emitted when it uses energy, and to provide space for its infrastructure. Since people consume resources and ecological services

from all over the world, their footprint sums these areas, regardless of where they are located on the planet (Figure 22).

In prior years, Ecological Footprint accounts included an additional component reflecting the electricity generated by nuclear power plants. To improve methodological consistency, this component is no longer included in the accounts. This does not mean that the use of nuclear energy is free of risk or demands on the environment, only that these risks and demands are not easily expressed in terms of biocapacity.

Humanity's Footprint first exceeded the Earth's total biocapacity in the 1980s; this overshoot has been increasing since then (Figure 23). In 2005, demand was 40 per cent greater than supply.

People use a variety of nature's services. If two or more services are compatible and can be derived from the same area, that area

44 LIVING PLANET REPORT 2008

**Sustainability in UAE Construction:
Signs of Change**

April 2006: Abu Dhabi took a bold and historic decision to embrace renewable and sustainable energy technologies.

Launch of Masdar, a global cooperative platform for open engagement in the search for solutions to some of mankind's most pressing issues: energy security, climate change and truly sustainable human development.

<http://www.masdaruae.com/>



**Sustainability in UAE Construction:
Signs of Change**

July 2006: The Emirates Green Building Council (EmiratesGBC), a not-for-profit organization with the goal of advancing green building principles for protecting the environment and ensuring sustainability in the UAE was formed.

Emirates GBC is currently developing Building Sustainability Assessment Tool, a green building rating system based on the American LEED rating system

<http://www.emiratesgbc.org/>



**Sustainability in UAE Construction:
Signs of Change**

October 2007: HH Sheikh Mohammed bin Rashid Al Maktoum, vice-president and prime minister of the UAE and Ruler of Dubai has issued a new resolution on the implementation of green building specifications and standards in the Emirate of Dubai.

Under the new resolution, all owners of residential and commercial buildings and properties in Dubai must comply with internationally recognised environmentally-friendly specifications. The resolution will be effective from January 2008.



**Sustainability in UAE Construction:
Signs of Change**

October 2007:

The headquarters of Pacific Controls is the first Platinum rated Green building in the Middle East and sixteenth in the world .



**Sustainability in UAE Construction:
Signs of Change**

October 2008 (from <http://www.usgbc.org>)

Certified (3)

Project Name	Owner	City	State	Country	LEED Rating
PACIFIC CONTROLS HQ BUILDING		Dubai		AE	Platinum
METITO HEADQUARTER OFFICES		Dubai		AE	Gold
DISTRICT COOLING CHILLER PLANT	MKM Commercial Holdings	Dubai		AE	Gold

Registered (277+)

Project Name	Owner	City	State	Country	LEED Rating System
"050" Towers, Dubai Water front, Dubai		Dubai		AE	LEED NC 2.2
A W Rostamani Logistics		Dubai		AE	LEED NC 2.2
Abdulla A Wahed Abdulla & Mahdi Mohd Asm		Dubai		AE	LEED NC 2.2
ABN AMRO DOZ INTERIOR WORKS	ABN AMRO	Dubai		AE	LEED CI 2.0
...					
Al Muneera - Island Residential		Abu Dhabi		AE	LEED NC 2.2
Al Muneera - Mainland Commercial		Abu Dhabi		AE	LEED CS 2.0
Al Muneera - Mainland Residential		Abu Dhabi		AE	LEED NC 2.2

1 2 3 4 5 6 7 8 9 10 ...

**Sustainability in UAE Construction:
Signs of Change**

May 2008: The Abu Dhabi Urban Planning Council (UPC), alongside the Environment Agency - Abu Dhabi (EAD), Abu Dhabi Municipality, and Masdar, announce 'Estidama', the program for sustainable buildings and communities for the Emirate of Abu Dhabi.

<http://www.estidama.org>



**Sustainability in UAE Construction:
Signs of Change**



Dubai Metro



Green Market Al-Dar (Urban Farm)



Masdar City (Zero Carbon City)



Bahrain World Trade Centre (Display for Renewables)

**Sustainability in UAE Construction:
Signs of Change**

SEWA investing in meeting its demand

"SEWA's current installed capacity is approximately 1800 MW. The construction of its gas fired power generation and desalination plant in Al Hamriyah is well underway, and will add a welcome contribution of 2000 MW to Sharjah's installed capacity."

Middle East Energy December, 2007

"Jebel Ali M power and desalination plant is Dubai's largest cogeneration project to date. It will increase power generation by 2000 MW. It is due to be completed in 2008 and commissioned in 2010. DEWA also signed a \$926 million contract for phase II of the Jebel Ali L station. This phase will add 1333 MW of capacity."

Middle East Energy December, 2007

"Spurred by a buoyant economy and population growth, the GCC countries will invest \$100 billion to generate 100,000 MW of additional power over the next 10 years to meet demand."

Flyer for Middle East Electricity conference planned for 8 Feb 2009

**Sustainability in UAE Construction:
Signs of Change**



Xeritown (Good climatic response & much more)

**Sustainability in UAE Construction:
Signs of Change**



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SUSTAINABLE VISION

BLUE RESPONSIBILITY

BLUE COMMUNITIES

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- Islamic Integrity Inspires Dubai's Capital: Naheel Harbour 3 Tower
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- Duba World Security to provide integrated security for The World Islands

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**Sustainability in UAE Construction:
Signs of Change**

Conferences



Cityscape Abu Dhabi 2008 hosts conference on Sustainable Development

Awards



Dubai Award for Sustainable Transport

Market Transformation



A Concrete Contribution to the Environment™
Advancing sound technologies to reduce the greenhouse gas emissions related to concrete construction in the United Arab Emirates.

**Sustainability in UAE Construction:
Cocktail of Standards**



Cocktail of Standards emerges to meet the demand!

- International:
Leadership in Energy and Environmental Design (LEED US)
ASHRAE Standards
- Dubai
Building Sustainability Assessment Tool (BSAT) ~ in development
- Gulf Countries
BREEAM Gulf ~ Launched in 2008
- Abu Dhabi
Estidama ~ in pilot stage

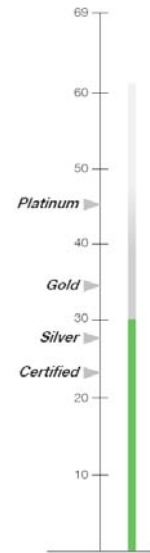




Cocktail of Standards
LEED (US + International)

- Developed by the USGBC
- Widely used in the ME

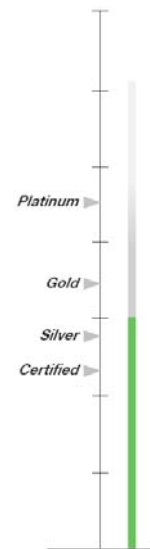
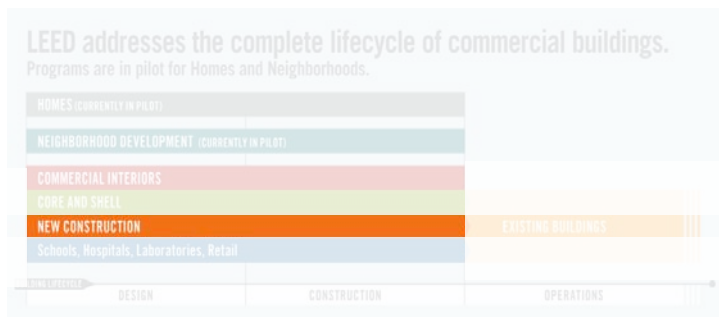
- Env. Categories:**
- Sustainable Sites
 - Water Efficiency
 - Energy & Atmosphere
 - Materials & Resources
 - Indoor Environmental Quality
 - Innovation & Design



Cocktail of Standards
BSAT

- Developed by the Emirates GBC
- Currently under development
- To be used in Dubai and ME in general

- Env. Categories:**
- Sustainable Sites
 - Water Efficiency
 - Energy & Atmosphere
 - Materials & Resources
 - Indoor Environmental Quality
 - Innovation & Design





Cocktail of Standards
LEED vs. BSAT: Key differences

LEED US

BSAT (LEED UAE)

	Avail	Yes	?	No		Avail	Yes	?	No
Water Efficiency	5	4	1	0		12	9	3	0
Water Use Reduction, Baseline Case					Not Used	Y	Y		
Water Efficient Landscaping, Reduce by 50%	1	1			50% reduction is not a prerequisite	Y	Y		
Water Efficient Landscaping, No Potable Use or No Irrigation	1	1				1	1		
Reduce make-up water for cooling towers by 50%						1	1		
Reduce make-up water for cooling towers by 75%						1	1		
Harvest 50% of Condensate						1	1		
Harvest 100% of Condensate						1	1	1	
Innovative Wastewater Technologies	1		1		Reduce Potable water use for sewage conveyance by 50% OR Treat 50% of sewage on site to tertiary standards	1		1	
Innovative Wastewater Technologies, Treat 100% of sewage on site						1	1		
Water Use Reduction, 10% Reduction						1	1		
Water Use Reduction, 20% Reduction	1	1				1	1		
Water Use Reduction, 30% Reduction	1	1			0.3	1	1		
Water Use Reduction, 40% Reduction						1	1		
Water Use Reduction, 50% Reduction						1	1	1	



BREEAM ¹²

Cocktail of Standards
BREEAM Gulf

- Developed by the BRE
- Released in 2008
- Unlike in the UK, BREEAM Gulf takes into account **all different uses** (e.g. offices, retail, residential etc.).

- Env. Categories:**
- Management
 - Health and Wellbeing
 - Energy
 - Transport
 - Water
 - Land Use and Ecology
 - Materials
 - Waste
 - Pollution



- Scope:**
- Design Stage
 - Post Construction Stage

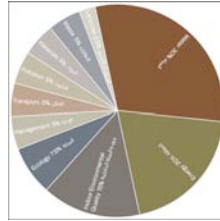
- Applicable to:**
- Whole new buildings
 - Major refurbishments of existing buildings
 - New build extensions to existing buildings
 - A combination of new-build and existing building refurbishment
 - New build or refurbishments which are part of a larger mixed use building



إستدامة
estidama

Cocktail of Standards Estidama

- Initiated by a group of government agencies and developers (UPC, EAD, ADM, and Masdar)
- An integrated program to devise guidelines and regulations for sustainable design, operation and maintenance of all types of buildings and communities within the Emirates of Abu Dhabi.



Env. Categories:

- Water
- Energy Use
- Indoor Environmental Quality
- Ecology
- Management
- Transport
- Pollution
- Materials
- Waste Management; and
- Land Use

Applicability

- All residential, commercial and institutional projects that are being reviewed by the UPC
- Renovation projects costing more than 50% of the value of existing structures
- Buildings and communities that are within the City of Abu Dhabi

شهادة الجودة Certification	جودة البؤلؤ Pearl Rating	الحد الأدنى Minimum Score
●	1 Pearl لبؤلؤة	35%
● ●	2 Pearls لبؤلؤتان	45%
● ● ●	3 Pearls ثلاث البؤلؤة	55%
● ● ● ●	4 Pearls أربع البؤلؤة	65%
● ● ● ● ●	5 Pearls خمس البؤلؤة	75%

Wrap-up

- Change is happening in the region.
- Market transformation is next and will be driven by legal requirements, voluntary standards but also by competition and ambitions.
- Lessons can be learnt from current projects in the region (Burj Dubai, Xeritown, Masdar.....)

Resources / references



<http://www.upc.gov.ae/>

تقرير حالة البيئة لإمارة أبوظبي
State of the Environment Abu Dhabi

http://www.soe.ae/Abu_Frontpage.aspx?m=175



<http://www.usgbc.org>



<http://www.estidama.org>



<http://www.emiratesgbc.org/>



<http://www.masdaruae.com/>