The New low carbon Urbanism :

Transforming our Cities through systems thinking + strategic design

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Peter Sharratt Global Director WSP Environment + Energy Peter.Sharratt@wspgroup.com

Can we do to cities what we are doing to buildings ?

Market Transformation

Measuring + Managing

Systems Thinking

Strategic Design

People

Circular City



Today's Buildings + Cities :

30% global GHG emissions
33% global resource consumption
12% global fresh water use
40% global solid waste production
10% global workforce employed

By 2020 70% of the world will be living in cities

NSP

Global population will grow almost a third by 2044 to 9 billion people.

That many people will need far more resources than exist on the planet.



1.8 billion people will live in regions of severe water scarcity.

And 2/3 of the world population is in areas of stressed water conditions.

The problem: Non-Renewable resources declining



CONSUMPTION

TIME

The Problem: Consumption increasing



CONSUMPTION

Implication: Unsustainable Growth





Aligning + transitioning for a low carbon and green economy



1 Transforming Markets

Aligning + transitioning for a low carbon and green economy



The scale of opportunity

B Building emissions can be reduced by

50%

using today's skills + technology mption



Market Transformation



"Strong regulation takes the risk away for clients, but can remove incentive for innovation



Regulation Drives the Market



Energy Performance of Buildings Directive (EPBD)

EPC

Energy Performance Certification required on buildings at point of sale, rent or following "major" refurbishment from April 2008

DEC

Display energy certificate – mandatory disclosure in use

Evidence : The Capacity to Change



Transition to low energy using products 1993-2005 (from CECED 2005).



Environmental Legislation



Market Transformation



Leadership requires innovation and defines best practice



Enabling Legislation : UK Feed In Tariff



Available roof area of 1,000m2 GE commissioned a study in 2006 An array of 845m2 was considered. Comparison with 2006 data

- 43% higher output possible
- 11% lower Capex
- Opex needs to be considered
- Viable financial returns



Wrong Profile: Multi-level roof Excessive plant on roof Overshadowed by neighbouring buildings



Aviation : Carbon Neutral Growth









Stansted Airport



ACI Policy

World Resolution on Climate Change (Nov 2007)

Aviation industry Commitment to Action on Climate Change (April 2008)

ACI Europe Resolution on Climate Change (June 2008)

Commitment to reduce carbon emissions from airport operations fully within their own control with ultimate target to become CO2 neutral.



Airport Carbon Accreditation Scheme



Sponsored by:









Administrators and Designers:



' The art of buying what is not available '



¹Making London more competitive ents







3 Systems Thinking

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Current Urban Footprint: **400sq km**

Growth of Dubai as currently planned

100

Planned Urban Footprint: **1300sq km**

Growth of Dubai as currently planned

18

CITY DIAGNOSTICS : NATIONAL ENERGY & WATER RESOURCES



Integrated Policy Frameworks





INTEGRATED PLANNING AND BUILDING POLICY AND REGULATION



The Reform Agenda



4 Strategic Design

Aligning + transitioning for a low carbon and green economy



Greater Helsinki Vision 2050



The project is currently working with 14 municipalities to create a common sustainable vision.

LINKING GREATER HELSINKI Greater Helsinki must interact globally and nationally. The region can be reached with super fast trains from St Petersburg, Tallinn and Stockholm as well as Central and Northern Finland. Flight connections and active harbours act as gateways to the whole country.



GROWTH PRINCIPLES

Expanding along shorelines and out to the sea.

Green Bays. Densification within the Metropolis Structure.

Development of regional frame. Small towns linked with rail network.



GREATER HELSINKI MAIN STRATEGIES

Metropolis Area
 Regional Frame
 Dense metropol on the coast,
 independent small towns and
 villages inland.





Low2No: Jätkäsaari, Helsinki

Sustainability Framework: operating principles of Low2No



Urban Informatics: creating interactive environments



Transitional strategy: roadmap to a carbon neutral



5 Connecting with People

Aligning + transitioning for a low carbon and green economy







We asked over 2000 people what they thought about a low carbon future, and here is London's view....

50% believe energy efficient households should get a council tax rebate

63% have a clear idea of what a low carbon future looks like

79% said if they were given a positive view of a low carbon future, they would feel inspired to achieve it

70% do not believe a low carbon lifestyle would reduce their standard of living







Customers should be able to understand health, ethical and ecological implications of the product through a simple 'traffic light' labelling



Life Cycle Thinking : Carbon in the Supply Chain



Creating new low CO₂ products



Cropping strategies which incorporates the use of rotations with legume crops has helped Rajesh reduce carbon emissions by 10%



Manuel has reduced methane emission by 20% from his livestock by feeding them with more concentrates



•Food being proceed in M&S green factories have reduced emissions by 30%



All energy used to transport and manufacture has been forested by M&S Energy wind farms in Aberdeen.

PLAN A PRODUCTS



'Carbon free' products on special racks that don't just have carbon reduced through offsets but have a greater degree of 'Plan A' applied to them through the supply chain.



Food waste used in Winchester farms has been composted and has been used to generate energy for the factory

REDUCING LONDON'S ECOLOGICAL FOOTPRINT

London Ecological Footprint = 50 million gha Possible to reduce London's Ecological footprint by between 20 & 25 million gha

UK Average

World Average

.

2.3gha/cap

5.3gha/cap

Earth Supply/bio-

1.9gha/cap 5.8gha/cap





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User focus: enabling low carbon choices

Low2No will create a positive cycle of interaction, awareness and incentives for



City Metrics



WSP

6 Big Ideas - Circular City

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Efficiency and the law of diminishing returns



Innovation

"We should optimize the economic structure...[and] advocate an environment-friendly way of production, life and consumption and bring about a virtuous cycle in both our ecological and socio-economic systems."

President Hu Jintao, Nov. 19, 2004 Santiago – Chile



Innovation : from linear to circular city









Masdar City Abu Dhabi



Zero Carbon

Zero Waste

One Planet Living









Learning from the past











It all starts with human comfort....





over 20% of the world's energy to keep us comfortable



HOW TO KEEP COOL IN A WARMING CLIMATE?



UAE is currently undergoing the most intensive local warming of any city in recorded history...

+ 1.5° C IN THE LAST 30 YEARS





By 2020 the City will be 2°C hotter



- Tourism: Summer will be 6 weeks longer
- Construction: days exceeding 40°C will increase eight times
- Education: 2 months during school time with temperature exceeding 40°C
- 8% increase in electricity demand
- 5% reduction in generating efficiency
- 8% reduction in desalination efficiency
- Increase in flash flooding

