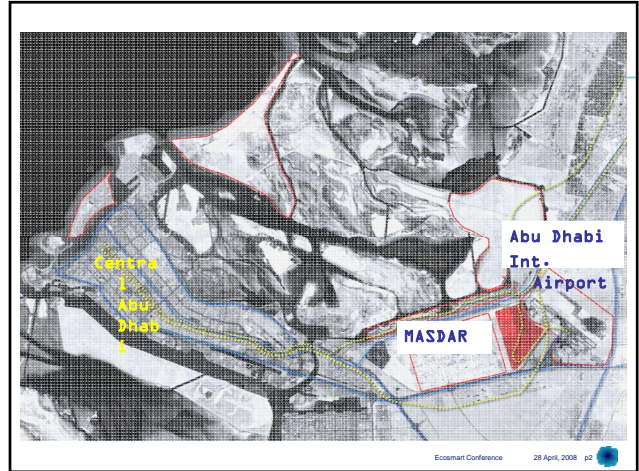


Sustainable Materials for Sustainable Cities  
 The Masdar View

*Ecosmart Seminar on Sustainable Buildings and Concrete  
 Abu Dhabi  
 April 22, 2008*



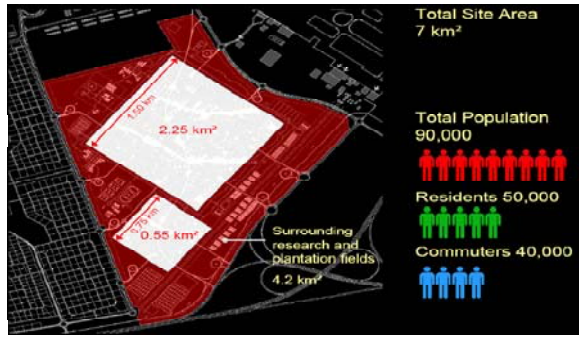
Mission, Metrics and Principles

- To Create a sustainable mixed use city where residents and commuters live the highest quality of life with the lowest environmental footprint
- Zero Carbon
- Zero Waste
- 100% renewable energy
- World leading energy efficiency standards
- Maximise water efficiency
- Closed loop energy, water and waste system

Masdar Development – The Master Plan



## Population Density



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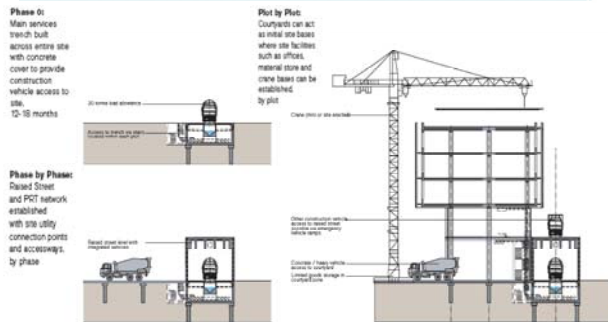
## Layering of the City



- Buildings
- Pedestrian level
- Services
- Personal Rapid Transport - PRT
- Main Infrastructure

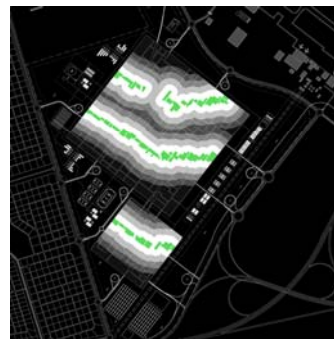
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## Layering of the city - construction



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## Accessible green spaces – walking distance



### Green linear Parks

**29%**

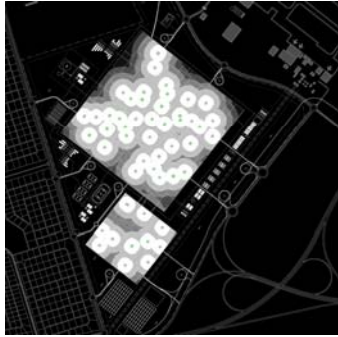
of the population has access to a linear park within

**1 minute**



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## Accessible green spaces – walking distance



### Public Squares

40%

of the population has access to a public square within

1 minute



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## Mobility – Light Rail Transport



### Car free City



### LRT



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## Mobility – Personal Rapid Transport



### Car free City



### LRT



### PRT



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## Mobility



### No Cars



### Walking



### Cycling



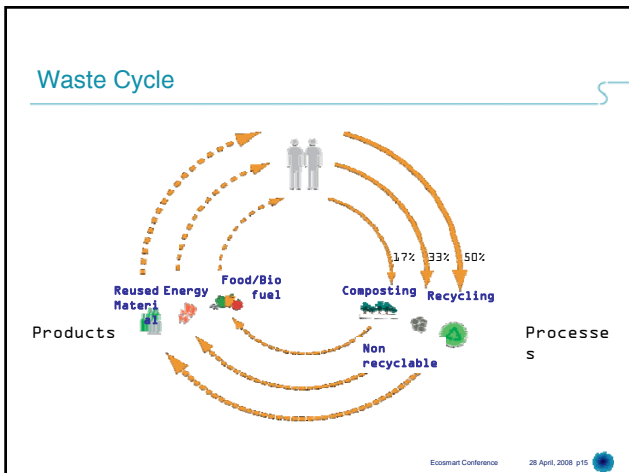
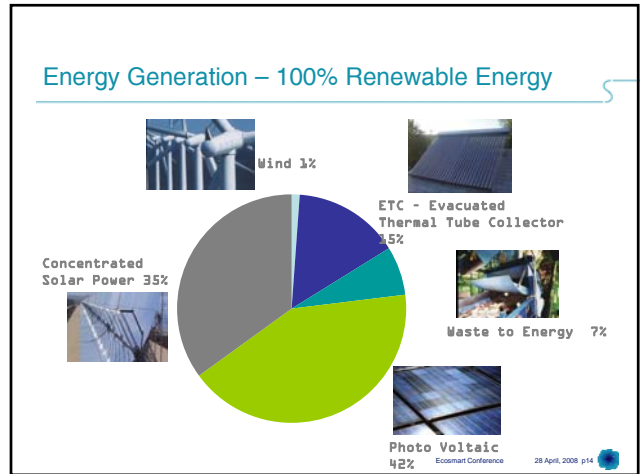
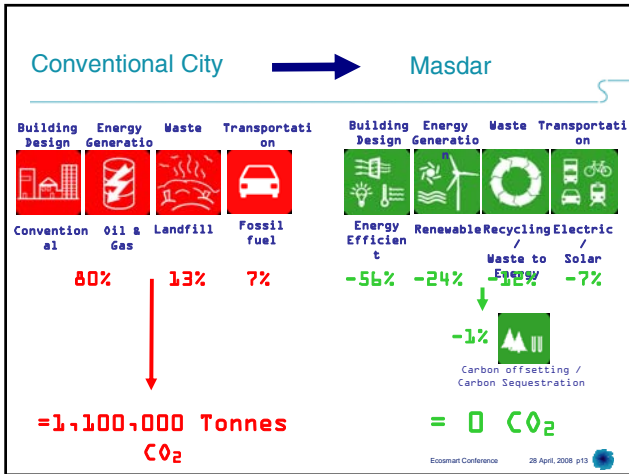
### PRT



### LRT



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## Sustainable Materials for Sustainable Cities

Five considerations:

- Embedded energy and embedded carbon
- Durability
- GHG (CO<sub>2e</sub>) emissions
- Availability
- Economy

## CO<sub>2e</sub> Assessment Methodology

1. Embodied Carbon Analysis  
In accordance with ISO 14064 to measure the carbon emissions generated during the manufacture and delivery of the product.

2. Life Cycle Analysis  
In accordance with ISO 14044 is a methodology for assessing the environmental aspects associated with a product over its entire lifecycle.

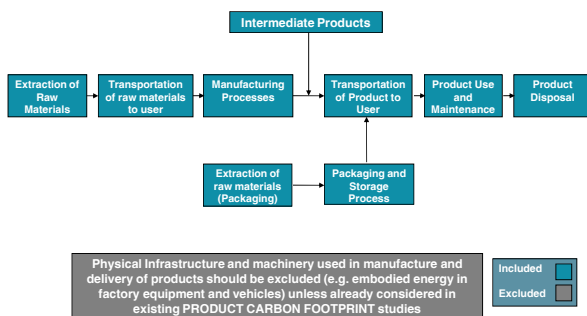
### Goal

Provide embodied carbon measurement to be used as a benchmark to compare future carbon reduction initiatives.

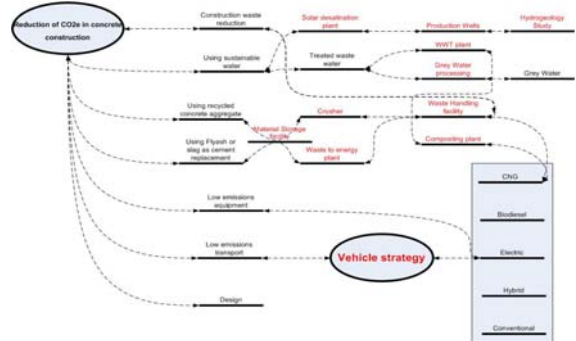
### Functional Units

Carbon dioxide equivalent emissions from one square meter built area (kgCO<sub>2e</sub>/m<sup>2</sup>)

## Building Materials LCA Scope & Boundary



## Reduction of CO<sub>2e</sub> in Concrete



## Carbon Reduction Opportunities

- Sustainable procurement integrated from design to execution.
- Reduce the requirement for materials or seek less carbon intensive alternatives.
- Optimize deliveries (e.g. use of consolidation centers, reduce over ordering).
- Use of renewables for energy generation.
- Use of low emission vehicles on site during construction.

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Thank You

28 April, 2008