

The Development Scale:  
Barangaroo – Adding Sustainability & Adaptive Capacity to Sydney?

Sydney Coastal Council Group Forum  
14 June 2011

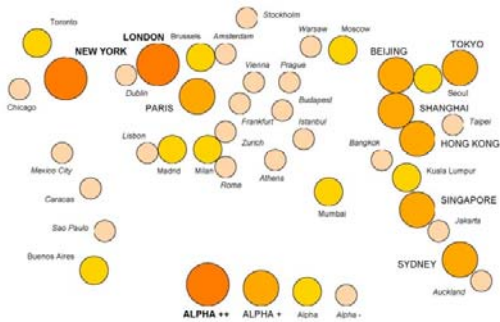


Professor James Weirick  
Director, Urban Development & Design Program  
University of New South Wales



Source: City of Sydney

Sydney as a Global City



Source: City of Sydney

2. Strong Global Economic Corridor

Build on the existing strengths of the Global Economic Corridor (Global Arc)

25 year employment targets:  
1. North Sydney to Macquarie Park  
65,000 new jobs  
2. Sydney CBD to Airport  
85,000 new jobs



East Darling Harbour International Competition, 2005-2006



Source: Sydney Harbour Foreshore Authority

2006

01



Source: Hill Thralls

01

2006

This is a sustainable project, fusing environmental, social and economic concerns to create a world-class place for Sydney. It is able to be flexibly adapted and delivered, in response to changing public expectations, civic requirements, social needs and market pressures.

Source: Hill Thalis

02

Source: Hill Thalis

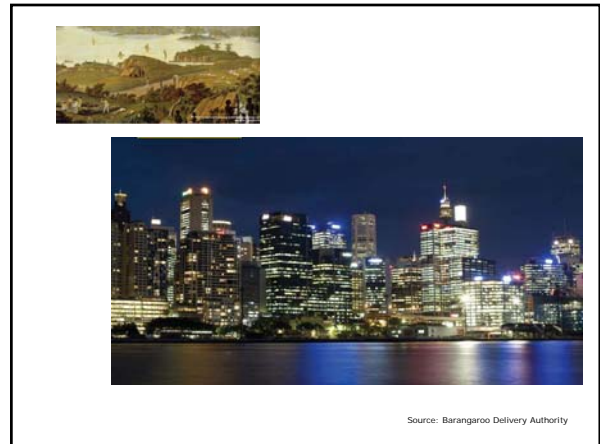
03

Source: Hill Thalis

Hill Thalis / Berkemeier / Irwin

Rogers / Schwartz

Source: Sydney Harbour Foreshore Authority



Sydney Harbour Foreshore Authority Concept Plan 2007



Source: Sydney Harbour Foreshore Authority



Source: Sydney Harbour Foreshore Authority

Barangaroo & Clinton Climate Initiative, November 2009



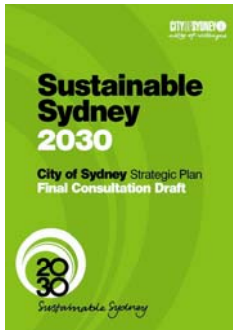
Source: Barangaroo Delivery Authority



Barangaroo will have a positive ecological and social footprint, by:

- being water positive, producing more water than it uses
- being carbon neutral, generating more renewable energy than it uses
- generating zero waste, with potential to clean up more waste than it generates

Source: Barangaroo Delivery Authority

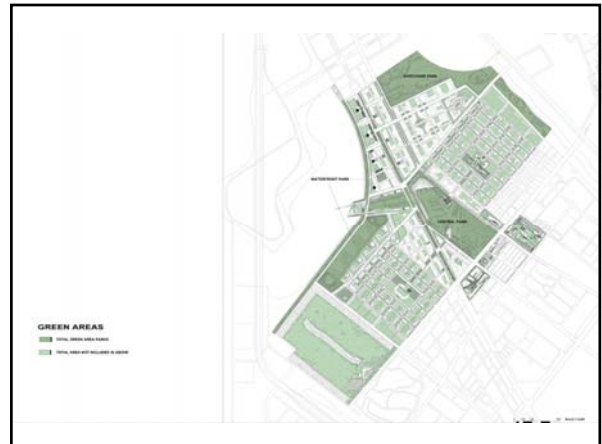
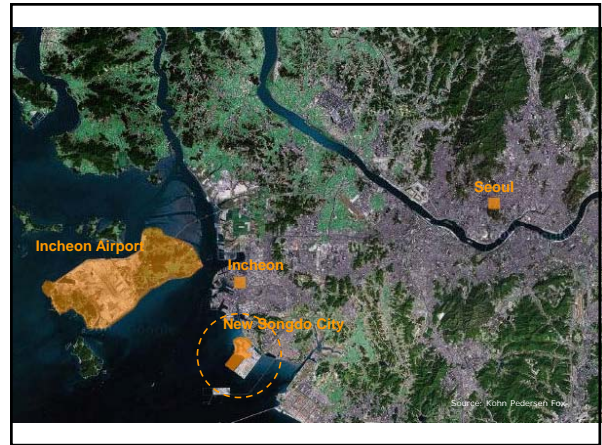
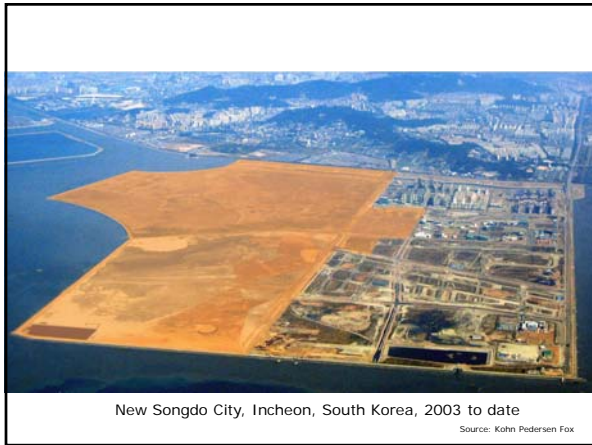


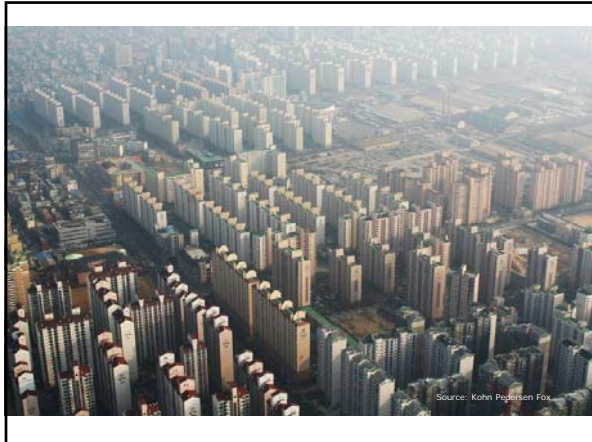
Source: City of Sydney, 2008

In 2030, City of Sydney will be



Source: City of Sydney





Increase energy efficiency

Minimize impact of storm water runoff

Decrease use of potable water

Pedestrian access to a garden city

Decrease use of fossil fuels

Provide for a healthy future

Benchmarking Strategies:

1. Participate in the USGBC's LEED for Neighborhood Development (LEED-ND) pilot program and certify the entire city as being sustainably developed.
2. Certify each of the 350 buildings using the Korean Green Building Rating System and the LEED for New Construction
3. Develop a carbon footprint and greenhouse gas reduction analysis to understand the real climate impacts and mitigation opportunities represented by the projects

Source: Whitman, Reid, von Klemperer, Radoff & Roy (2008)

GHG calculation (city in operation):

- indirect (i.e. off site) emissions from electricity generation
- direct emissions from on-site fossil fuel combustion for building heating and domestic hot water
- direct emissions from fossil fuel combustion for passenger and public transit vehicles
- refrigerant leakage from HVAC systems
- methane emissions from waste water treatment and solid waste disposal

Reduction strategies:

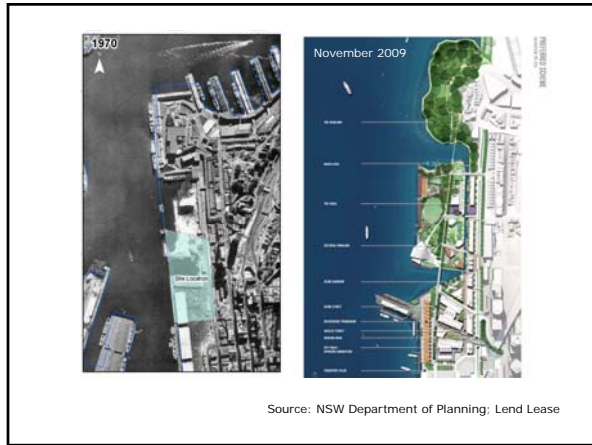
- energy efficiency of buildings
- energy efficient infrastructure
- waste to energy technologies
- reduction of vehicle miles traveled (VMT), including increased mass transit and bicycling
- efficiency of power supply (including on-site renewable energy generation)
- reduction of carbon intensity by fuel switching
- improved waste management

Source: Whitman, Reid, von Klemperer, Radoff & Roy (2008)

Central Park Development, CUB Site, Broadway

Source: Ateliers Jean Nouvel / Frasers Broadway





**Lend Lease Initiatives - 2010**

- Healthy Buildings:**
  - World-leading 6-Star Green Star Commercial Office Design and Built certification with absolute design and fresh air
  - 5 Star Green Star Residential
  - Tuned to Sydney's climate and connected to outdoors
  - Passive design, ultra low energy buildings
  - Use of some sustainable materials – recycled content and low emissions
- Energy and Carbon:**
  - A carbon neutral outcome supported by the use of new off-site renewable energy generation
  - Significant reduction in building energy consumption
  - 25% reduction in embodied carbon due to building materials
  - Efficient precinct infrastructure using central cooling plant and hot/cold water network
  - On-site photovoltaic generation used for the public domain and blackwater treatment system
- Water Positive:**
  - A water positive outcome – where more water is exported than potable water is imported
  - Treatment and reuse of a proportion of on-site stormwater catchment
  - On-site water treatment and water recycling
  - Capacity to export recycled water allowing neighbours to reduce their potable water demands
  - Beaver mining to reduce network demands
- Zero Waste:**
  - Greater than 90% diversion of construction waste from landfill
  - Greater than 90% diversion of operational waste from landfill
  - Closed loop return of waste soil and energy from waste processing
  - The potential to extend this service to adjoining properties
- Biodiversity Transport:**
  - A new connectivity point for the CBD (with provision for light rail, bicycle, bicycle/pedestrian lanes)
  - Reduced car parking volume for Retail and Commercial, using City of Sydney, CDP rates for Residential and Tourism (per '1000' Supplementary Report)
  - Shared Retail and Commercial and Tourism use car parking
  - Infrastructure and support for bicycles and pedestrians (per '1000' Supplementary Report)
  - Real-time commuter updates
  - Green travel plan to promote vehicle sharing, small cars and electric cars
- Landscape And Biodiversity:**
  - Use of native flora and encourage habitats for fauna
  - Inclusion of water sensitive urban design
  - Planning for climate change
  - Landscape public spaces and selected green roof features

**9.13 Failure to achieve specific Climate Positive Initiatives**

(a) Without limiting clause 9.12, the Developer agrees that:

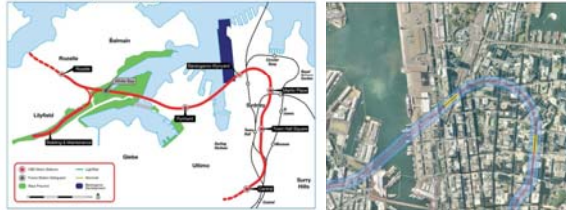
(i) it will use its best endeavours to achieve the targets referred to in the table below (Column A) by the respective dates specified for those targets referred to in the table below (Column C), and

(ii) if it fails to achieve a target referred to in the table below (Column A), it must apply to the Authority for an extension, or where relevant, the relevant proportion of the amount set opposite that target (Column B), when measured in accordance with Column C.

Target Column A	Liquidated Damages Column B	When measured Column C
Green Star 6 Star Office As Built Rating (new building or improved rating as agreed in accordance with clause 9.12)	\$ (to be apportioned equally to all commercial buildings of 10,000sq' GFA or more)	
Green Star 5 Star Multi Unit Residential As Built Rating or improved rating as agreed in accordance with clause 9.12)	\$ (to be apportioned equally to all residential buildings of 10,000sq' GFA or more)	
Green Star 5 Star Retail As Built Rating (subject to the retail centre able to be separately rated or improved rating as agreed in accordance with clause 9.12)	\$ (to be apportioned equally to all retail buildings of 10,000sq' GFA or more)	
Completion of ecological footprint and carbon footprint reports and assessments	\$	

BDA-Lend Lease Project Deed Agreement, March 2010

Sydney CBD Metro Proposal 2009-2010



Source: NSW Department of Planning

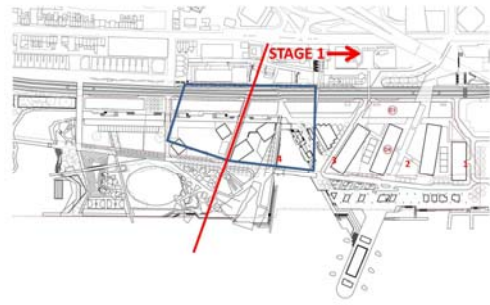
Sydney Light Rail Proposal 2010



Source: NSW Department of Planning



Source: Barangaroo Delivery Authority

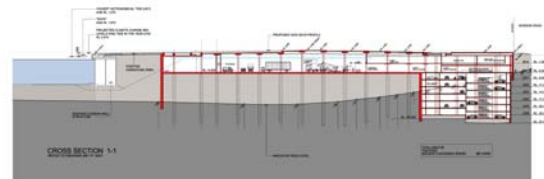


DECCW Declared Area  
Block Number and Boundaries

STAGE 1 SITE PLAN



BARANGAROO Sydney AUSTRALIA  
Architectural & Engineer Services  
Project Application SP16/001/PL/1  
Site Plan



INDICATIVE LAYOUT ONLY  
BARANGAROO Sydney AUSTRALIA  
Architectural & Engineer Services  
Project Application SP16/001/PL/1  
Cross Section 1-1







Headland Park



Figure 16: Headland Park public realm (Source: Public Realm plan, PRP and PAR, Dec 2010)

Source: Peter Walker Partners / Johnson Pilton Walker

Headland Park

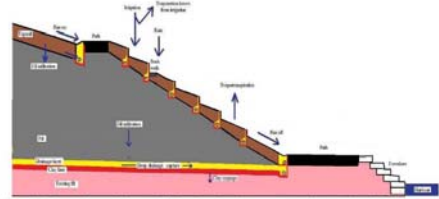


Figure 18: Schematic of water balance model showing various input components. (Source: Water Balance Report, Agriwiro Solutions, Sept 2010 in Attachment A of the Integrated Water Management Plan)

Source: Peter Walker Partners / Johnson Pilton Walker

Headland Park

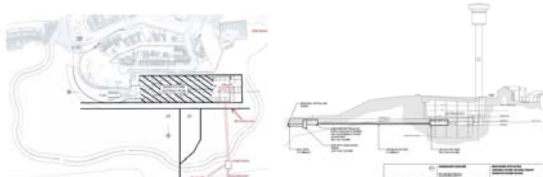


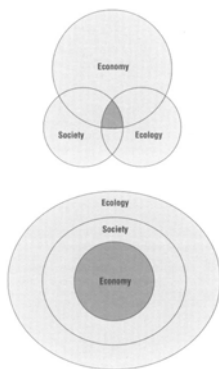
Figure 19: New Water Cooling Concept Plan (Source: Soil and Water Report, WSP Environment & Energy, Dec 2010)

Figure 20: New Water Cooling Section (Source: PRP and PAR, Dec 2010)

Source: Peter Walker Partners / Johnson Pilton Walker



Source: Leifd Lease



Source: Ian Lowe – Australia, State of the Environment, 1996

