EcoEconomy and Infrastructure

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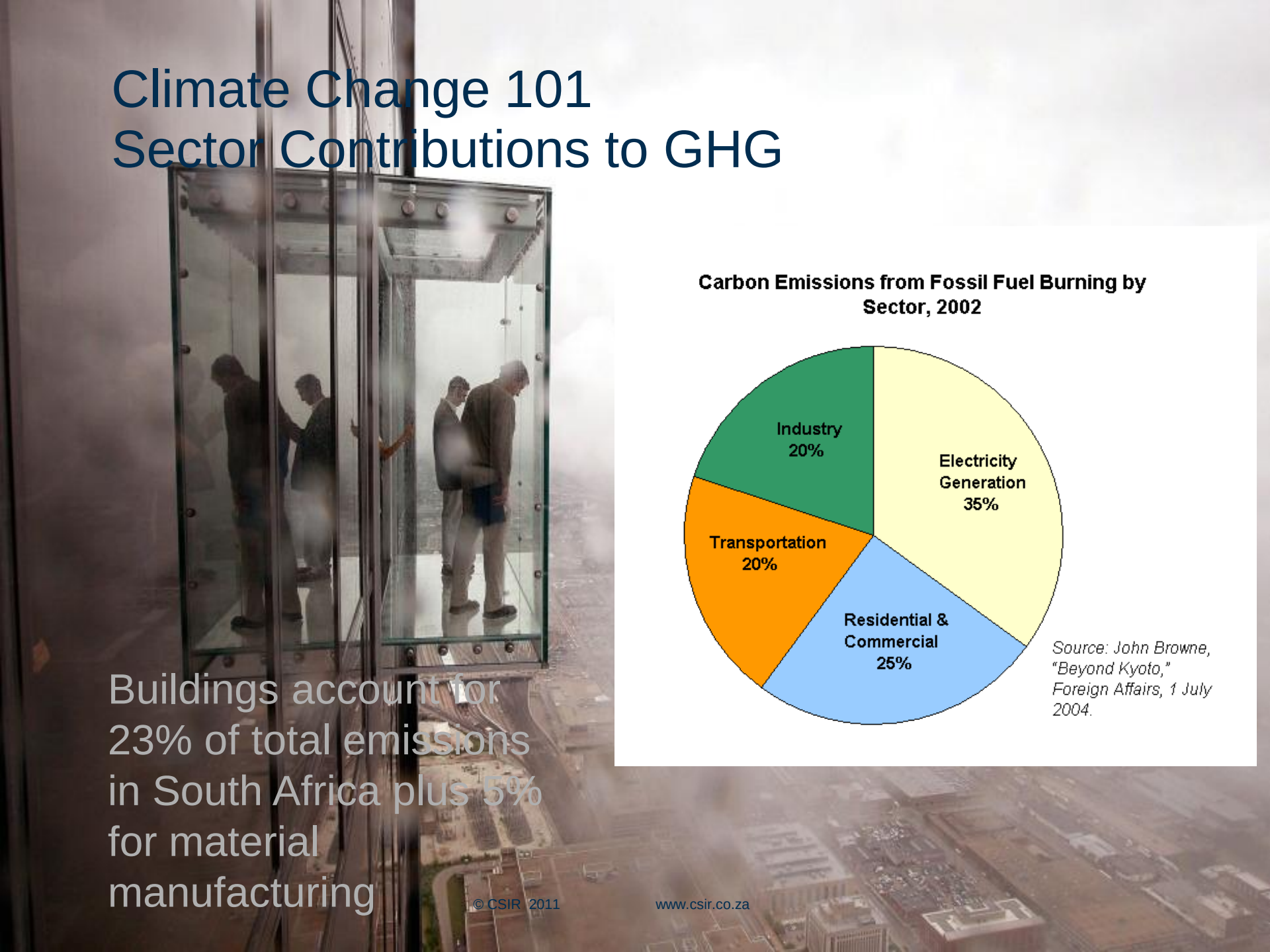
Climate Change 101
Carbon-based Economy

Challenge: our economy is carbon-based. Economic growth means carbon growth.

1) Move to a carbon neutral economy (carbon reduction and carbon capture)
2) Move to a carbon-free economy

Climate Change 101
Sector Contributions to GHG



Carbon Emissions from Fossil Fuel Burning by Sector, 2002

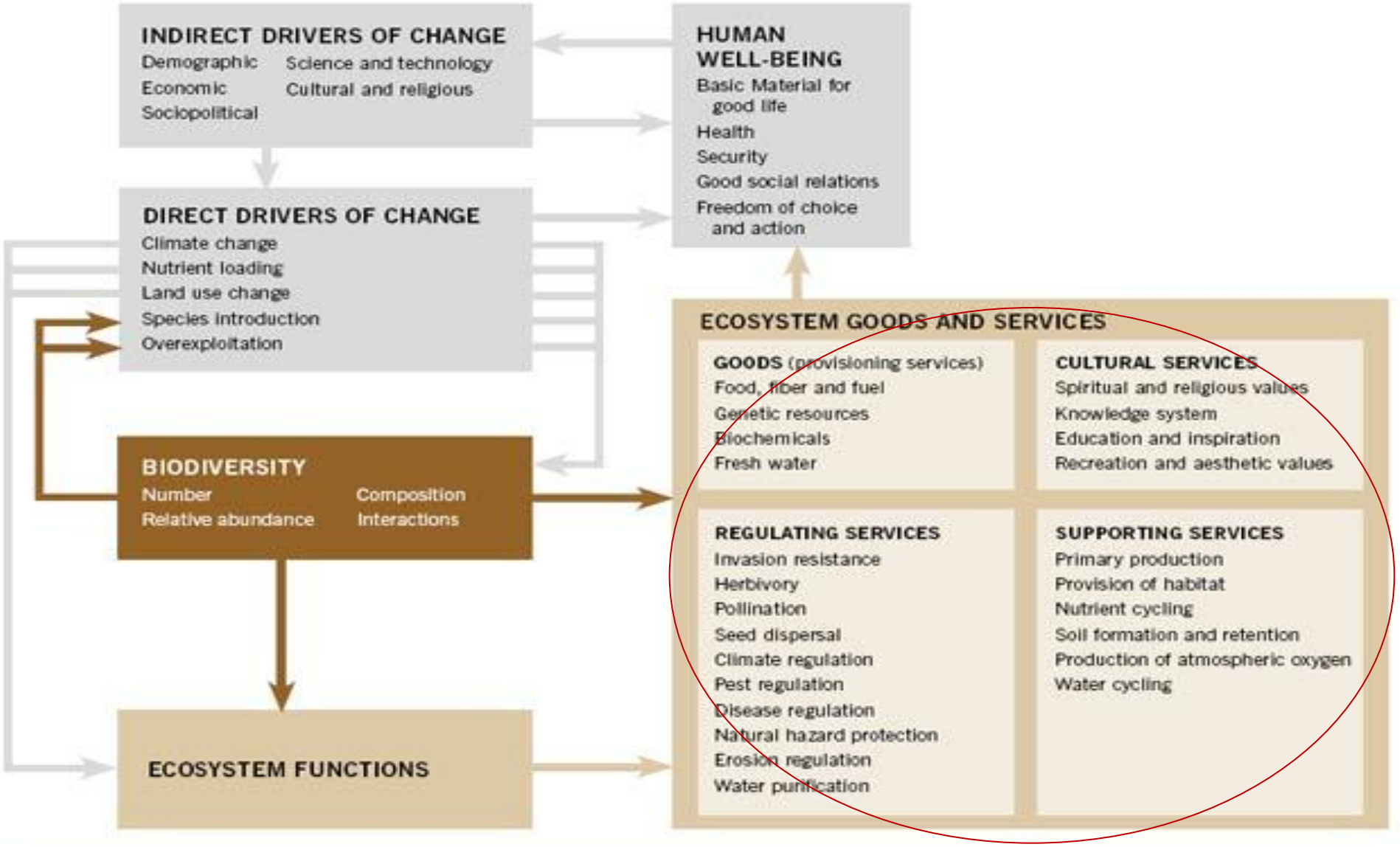
Source: John Browne, "Beyond Kyoto," Foreign Affairs, 1 July 2004.

Buildings account for 23% of total emissions in South Africa plus 5% for material manufacturing

Climate Change 101
Sector Contributions to GHG

Ecological Goods and Services

- Ecological goods and services are the benefits arising from the ecological functions of healthy ecosystems



Biodiversity is affected by drivers of change and also is a factor modifying ecosystem function. It contributes directly and indirectly to the provision of ecosystem goods and services. These are divided into four main categories by the Millennium Ecosystem Assessment: goods (provisioning services) are the products obtained from ecosystems; and cultural services represent non-material benefits delivered by ecosystems. Both of these are directly related to human well-being. Regulating services are the benefits obtained from regulating ecosystem processes. Supporting services are those necessary for the production of all other ecosystem services.

Environmental Goods and Services Anthropological Impacts

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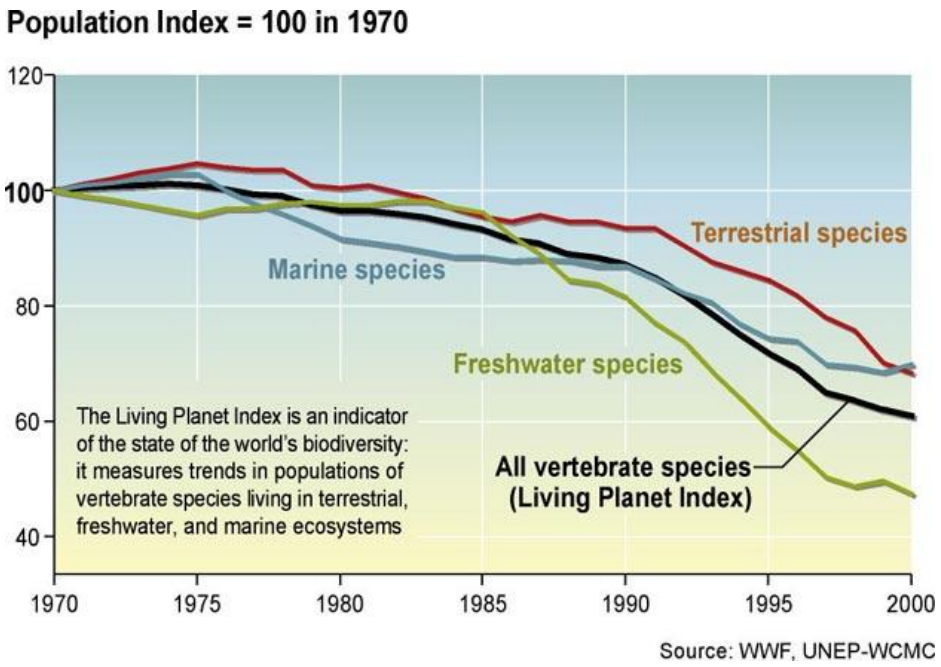
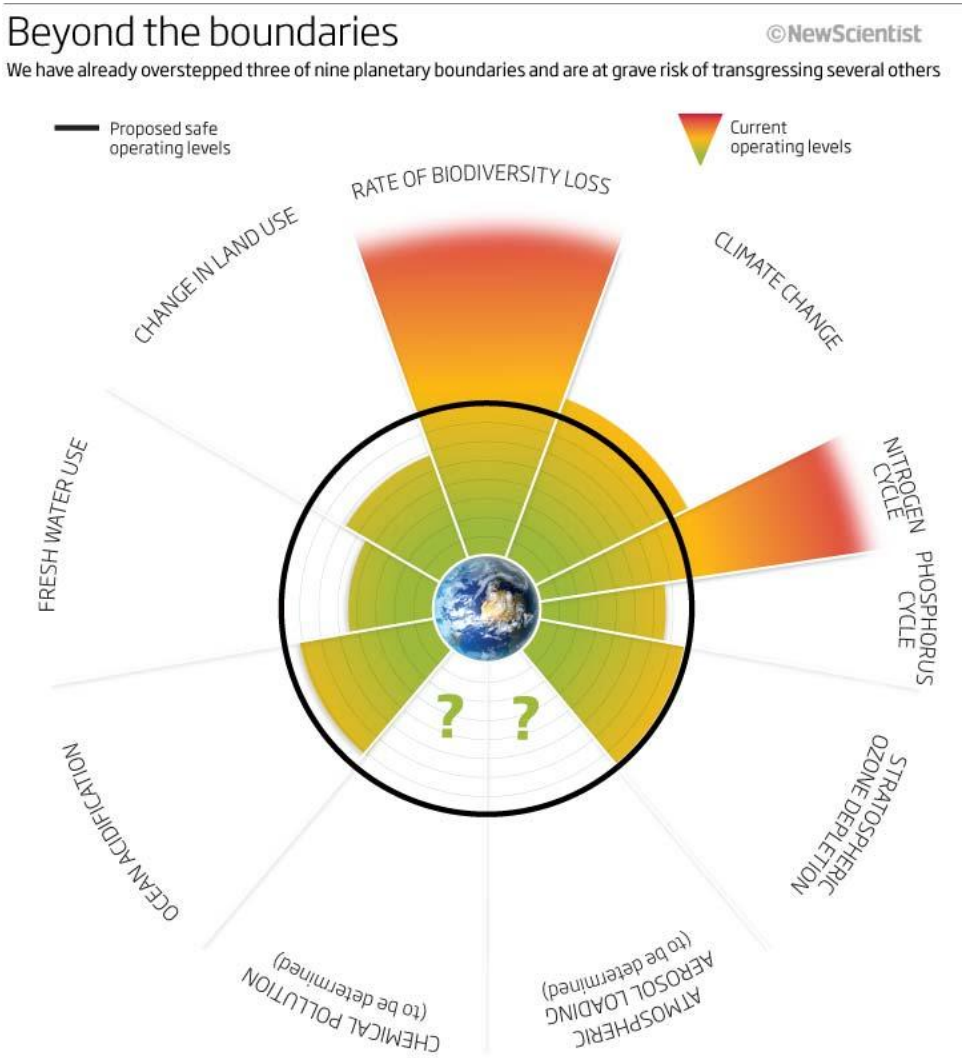
- Increasing fragmentation of landscape threatens ecosystem health and resilience

Environmental Goods and Services Anthropological Impacts





Risk Analysis and Impacts

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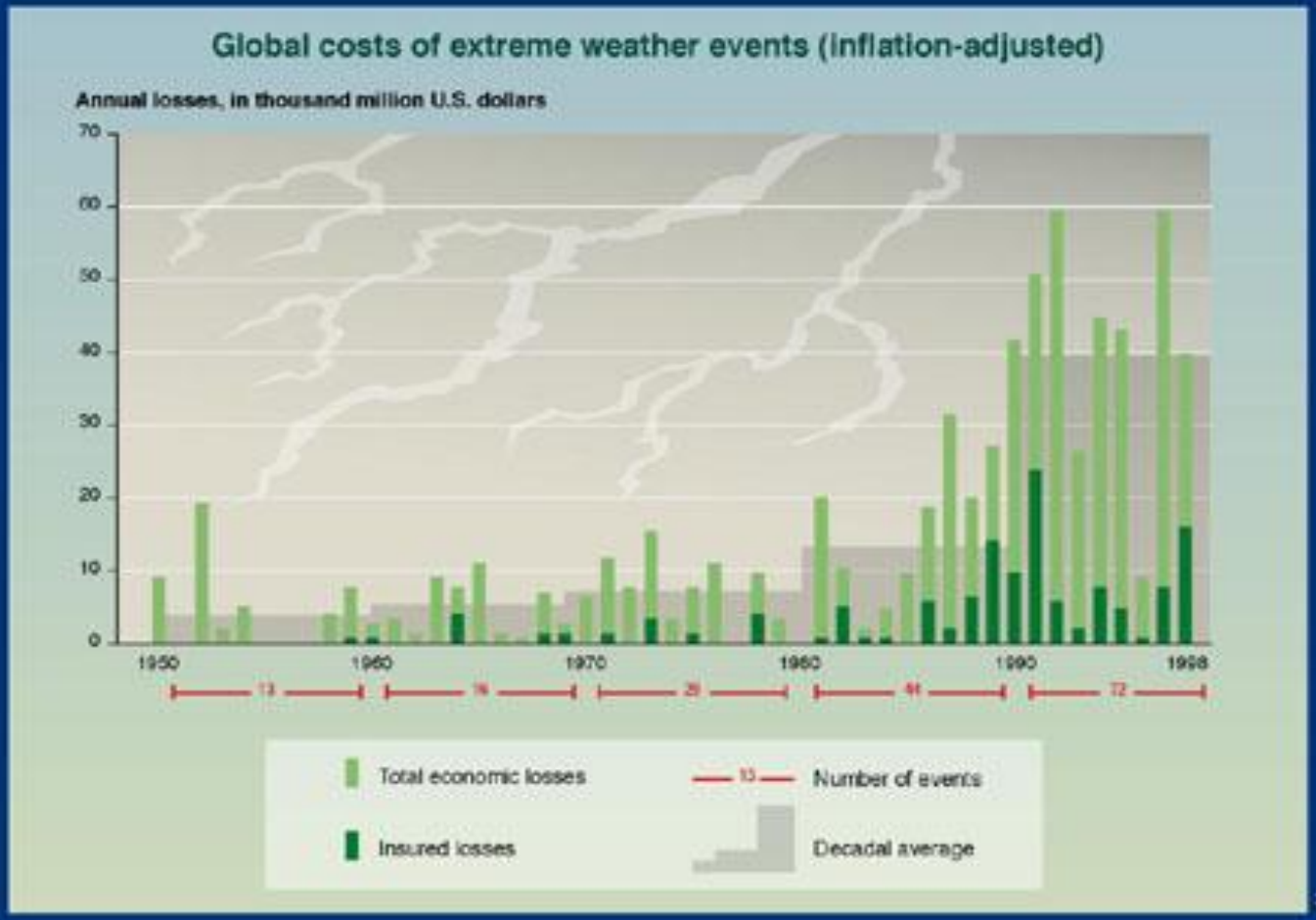

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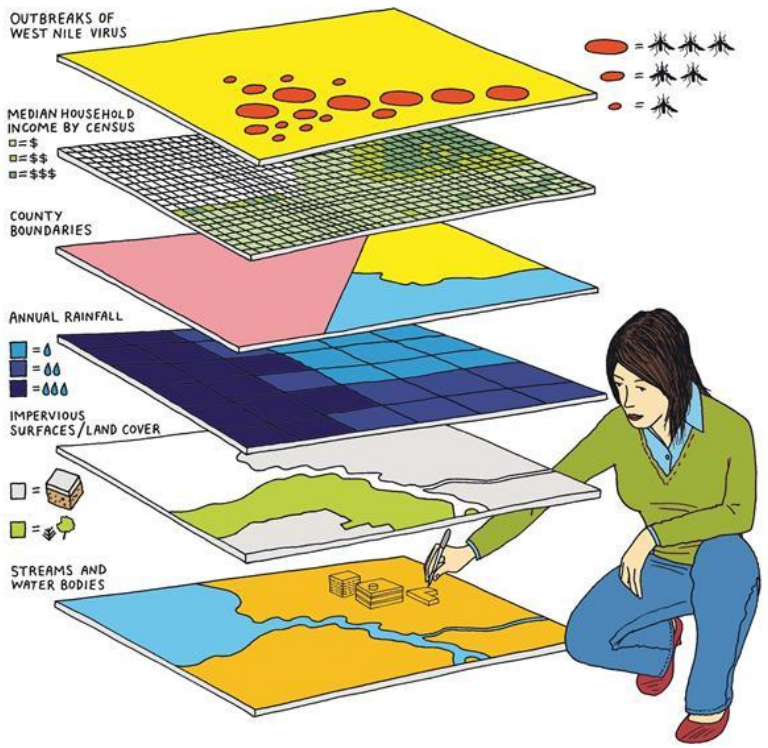
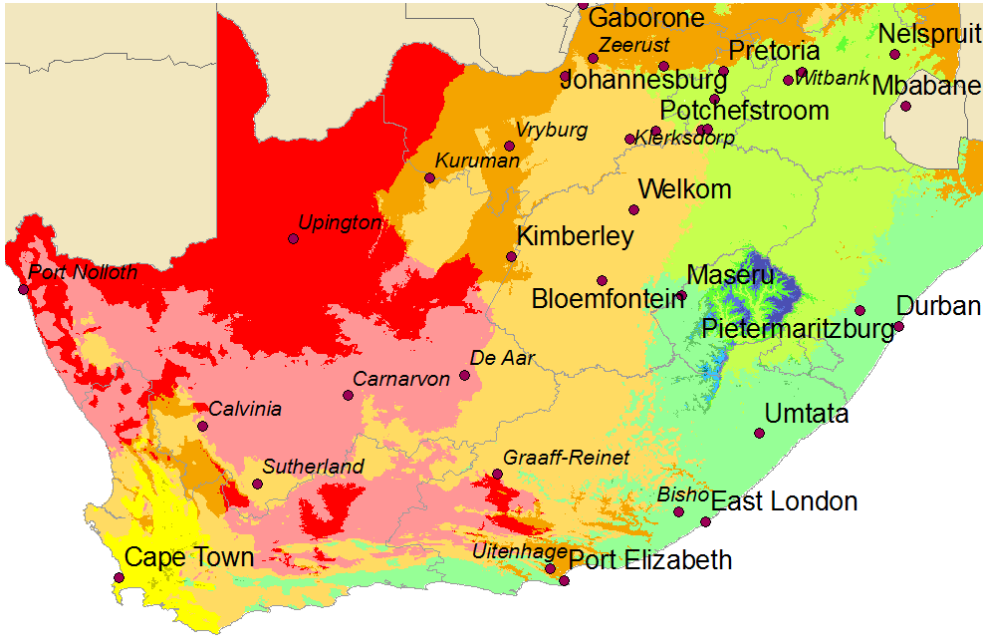
Adaptation and Mitigation Strategies
Step 1: Impact Mapping



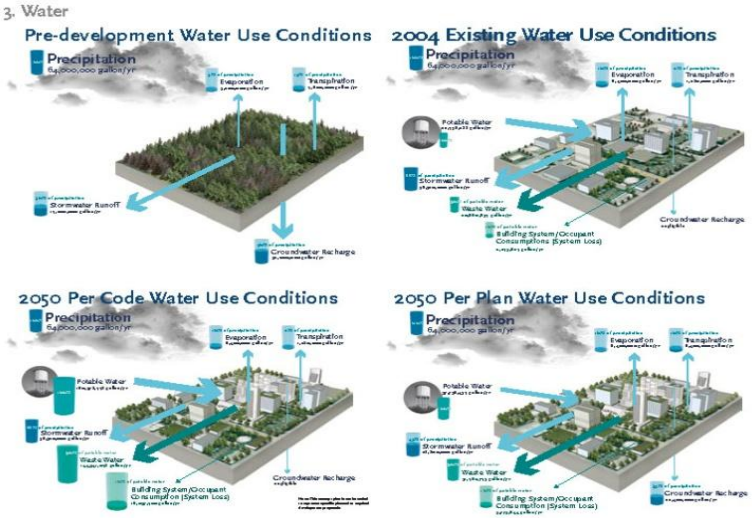
- Climatic Zones
- Geology
- Precipitation
- Sea surge
- Wetlands
- Demographics

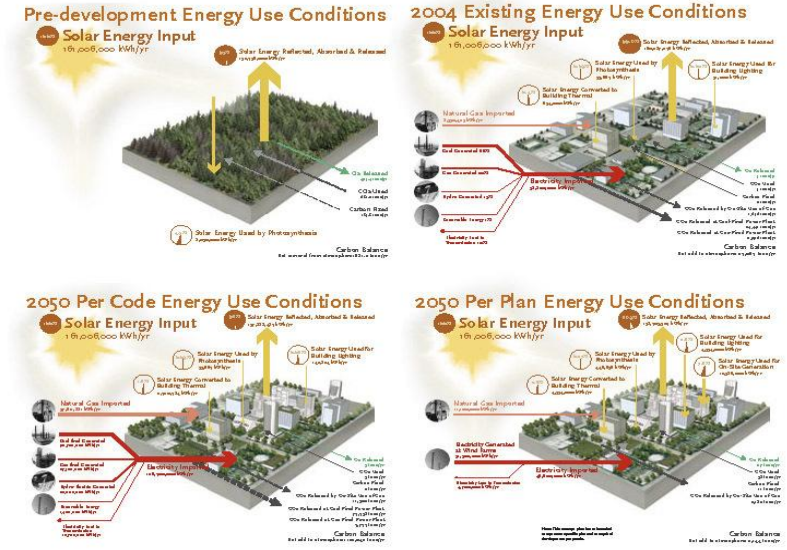
Adaptation and Mitigation Strategies
Step 2: Design for Change

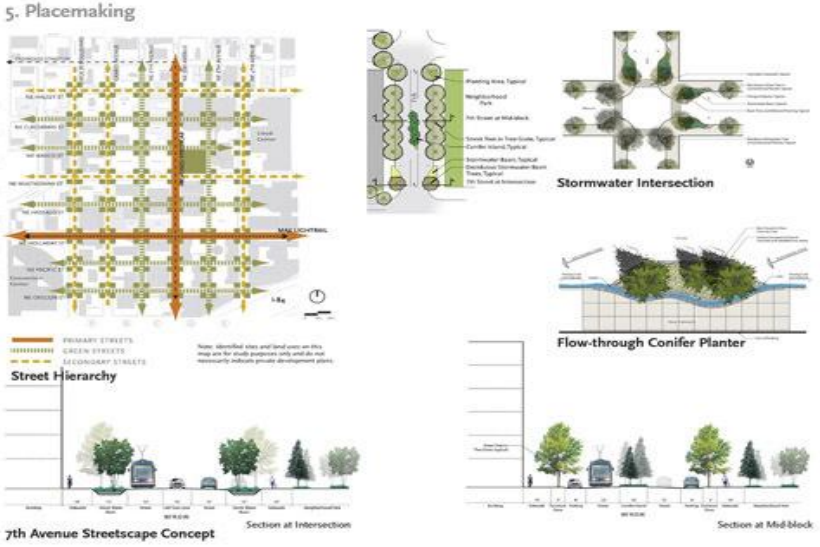


- **Buildings are built for 50+ years**
- **Infrastructure is built for 100+ years**
- **The buildings and infrastructure we build today have to be robust enough to withstand expected changes**

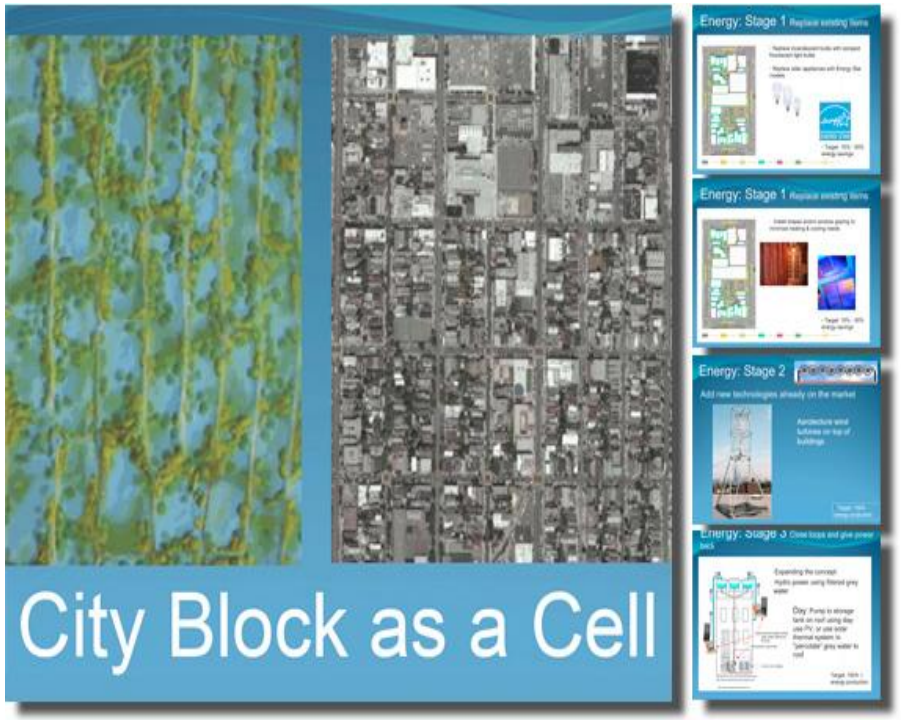
Adaptation and Mitigation Strategies
Step 3: Set Goals and Targets

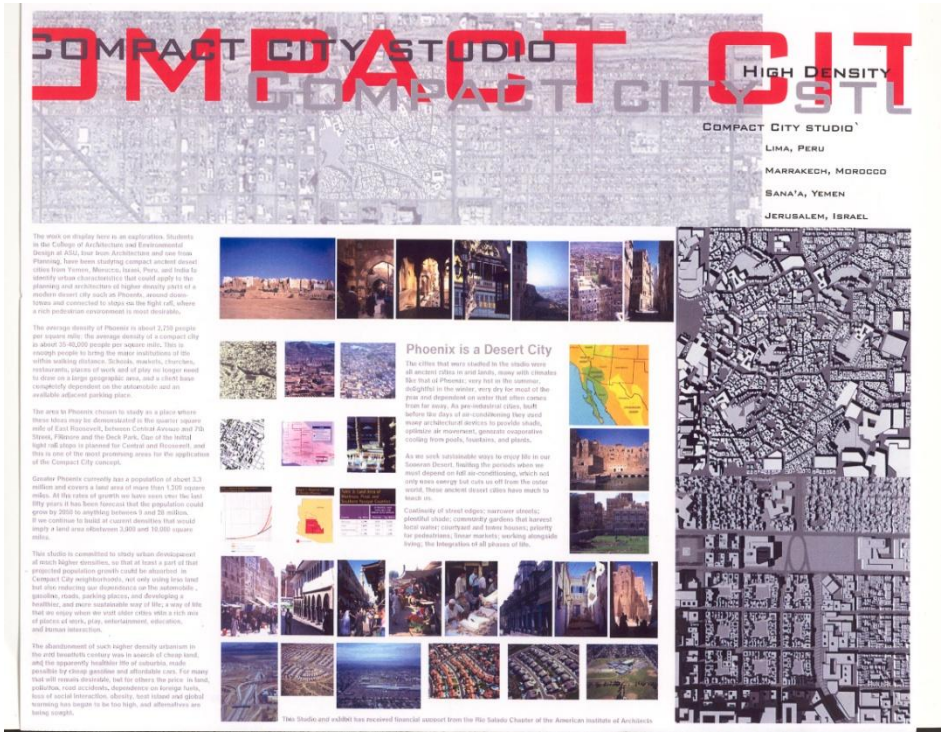




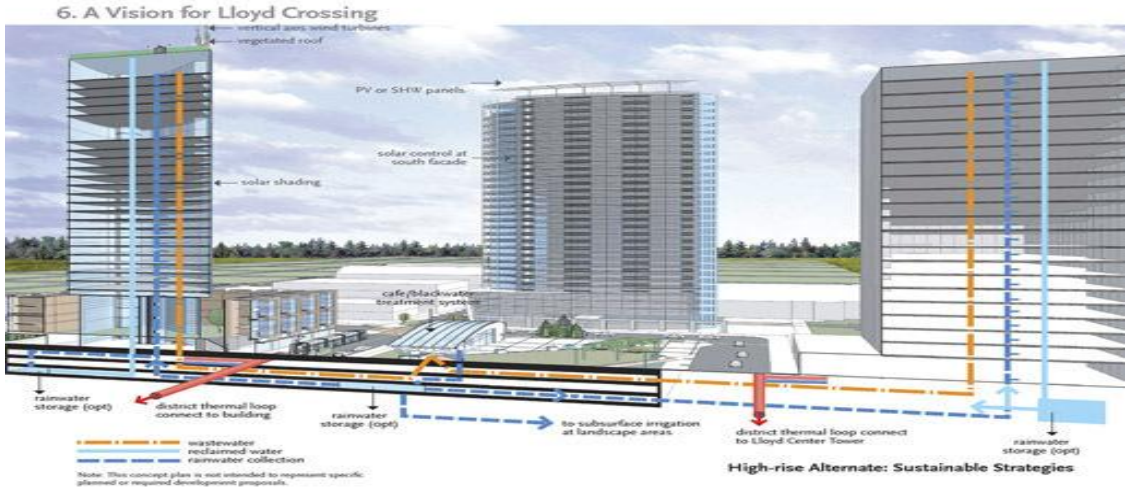


Adaptation and Mitigation Strategies: Step 4: Land Use and Ecology Planning





Adaptation and Mitigation Strategies: Step 5: Green Infrastructure Planning



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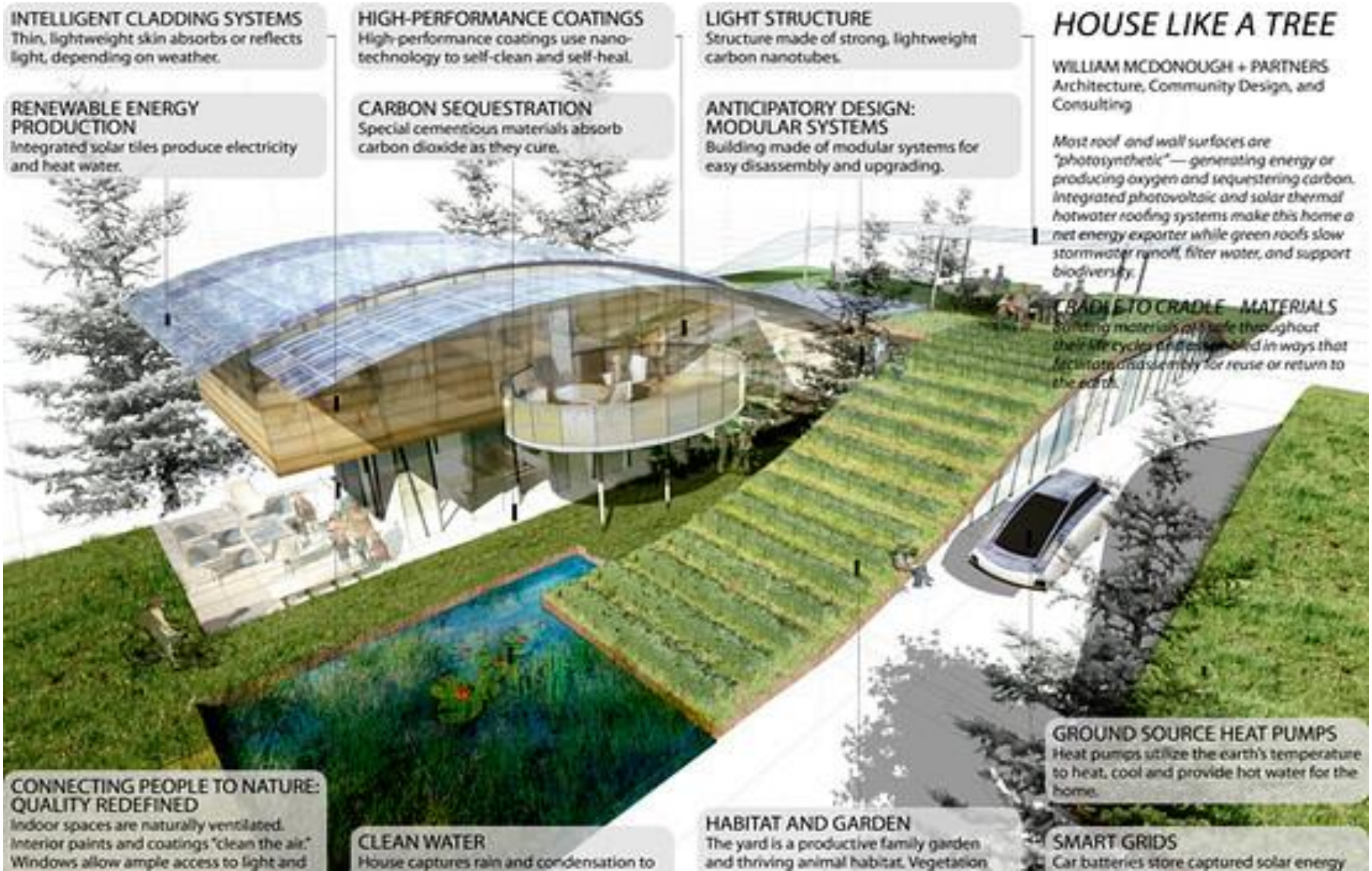
Adaptation and Mitigation Strategies:
Step 6: Integrate Ecosystems and Architecture

Adaptation and Mitigation Strategies: Step 7: Strive for Net-Zero Buildings



Framework for Resilient Human Settlements
Political Will

- First and foremost, political commitment is a main trigger for adaptation and mitigation

Framework for Resilient Human Settlements
Future-proofing Human Settlements

- Improve the understanding of both the processes that currently influence weather and climate and how such processes may change with future climates.
- Examine potential losses and gains under various climate scenarios
- Integrate climate risks into development planning
- Improve understanding of relative contributions of the mix of biophysical and socio-economic and human factors to changes and how the people/planet interface is influenced
- Construct the “10-50 Solution” to climate change (PEW Centre 2005)

Framework for Resilient Human Settlements
Prioritise the Building Sector

- Integrate Approaches
  - Combine technical and policy solutions
  - Combine engineering approaches and architectural design
  - Combine design decisions and building operations
  - Combine green building and smart growth concepts
- Take an Expansive View
  - Future building construction (LCA, design, deconstruction)
  - Use (on site power generation and grid interface)
  - Location (urban densities, access to services and employment)
- Prioritise Building Sector
  - Net-Zero Building (energy, water, waste, emissions)
  - Re-examine Building Codes (health and safety)

Framework for Resilient Human Settlements
Community Empowerment

- Despite dramatic improvements and recognition of the role of the social sciences and climate change, much more urgent work is required to help people live with such risks and adapt to future changes.
- “If we are to ‘live with change’ effectively, we will need inputs from trans-disciplinary and inter-disciplinary sciences, as well as from wider civic society, government, non-government and business. The move for greater community-based efforts must continue,” (Vogel).
- Promote disaster reduction at local level by enabling community coping strategies

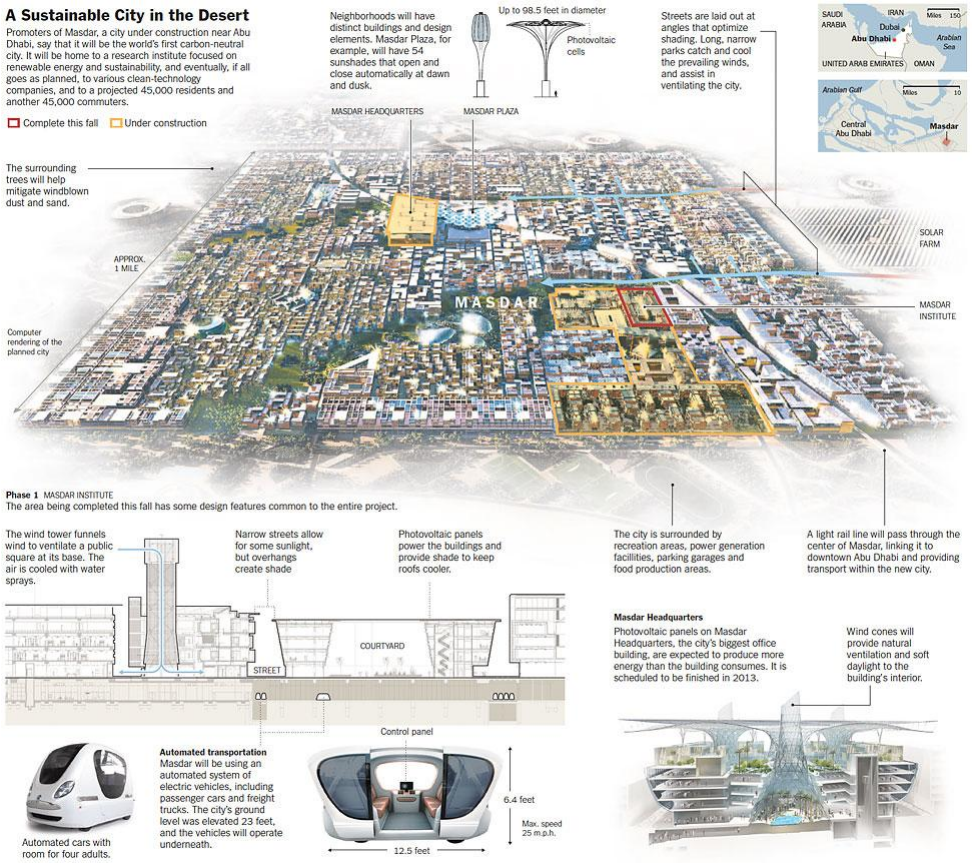
Framework for Resilient Human Settlements
Communicate Effectively

- Accessible and effective communication is needed. This relates to communication in terms of what is meant by climate change as well as communication about possible impending climate events and longer-term projection of climate change.
- Early warning systems may need a re-orientation that includes warnings for extremes and shocks as well as enabling actions to be taken with regard to some of the daily changes that may accompany climate change.
- Information on health status and nutritional information, when packaged together with information on possible seasonal rainfall changes, may be required and included into a more flexible system.

Framework for Resilient Human Settlements
Create Institutional Capacity

- Improved institutional designs, including institutions that enable better horizontal integration of information together with traditional vertical information flows, are being suggested.

Conclusion



- 21st C, post-modern epoch, is a turning point for humanity.
  - Old environmental management theories and practices have no ongoing value
- Sustainability seeks balance between people/planet
- Development must improve quality of life
  - 'Do least harm' not good enough

Thank you

Siamak Hariri Baha'I temple, Santiago