



CARBON NEUTRAL URBAN DEVELOPMENT

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OUTLINE OF TALK

1. Cities and the Built Environment
2. Precinct scale carbon abatement
3. Barriers & Incentives to low carbon development
4. Overview of ARC project
5. Accrediting urban development
6. Further research

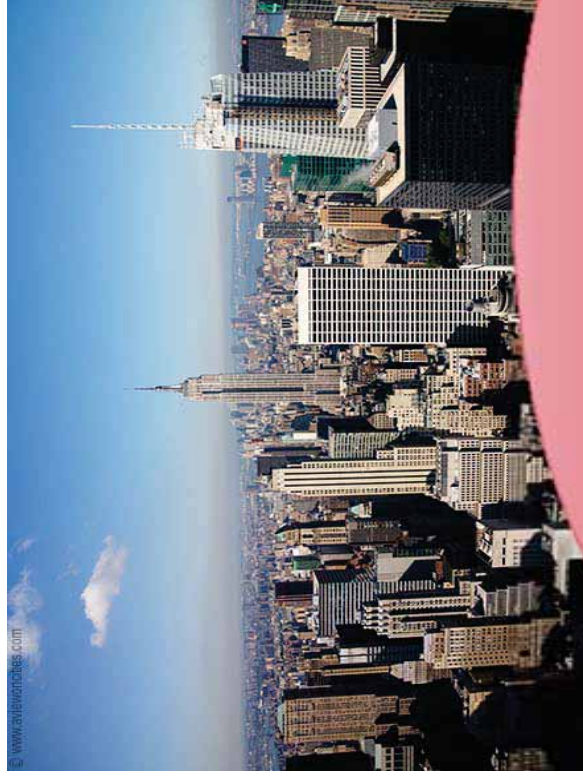
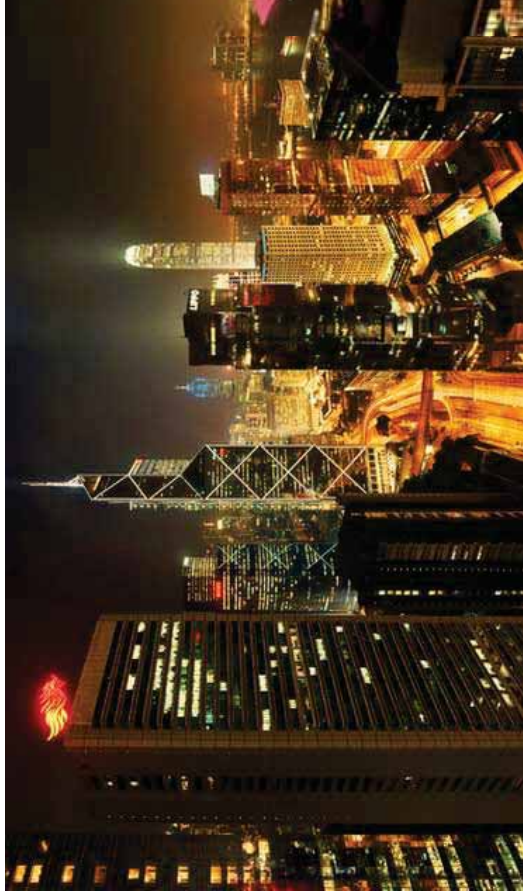
Can land development be accredited for its carbon reduction potential?

What are the benefits of doing so?

What are the benefits of doing so?



Cities a huge
consumer of
resources



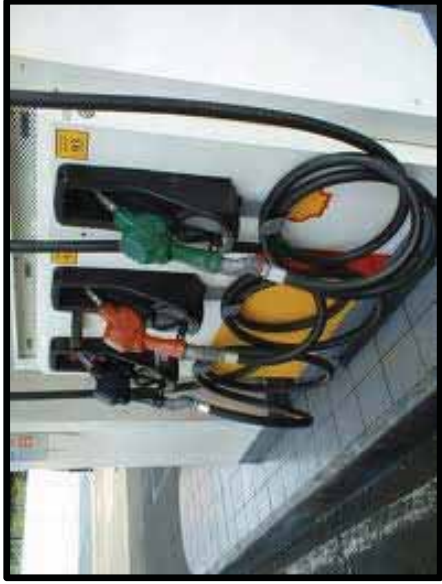
- Over **2/3** of primary energy demand globally
- Up to **70%** of GHG's

© Based on
**centralised
infrastructure**

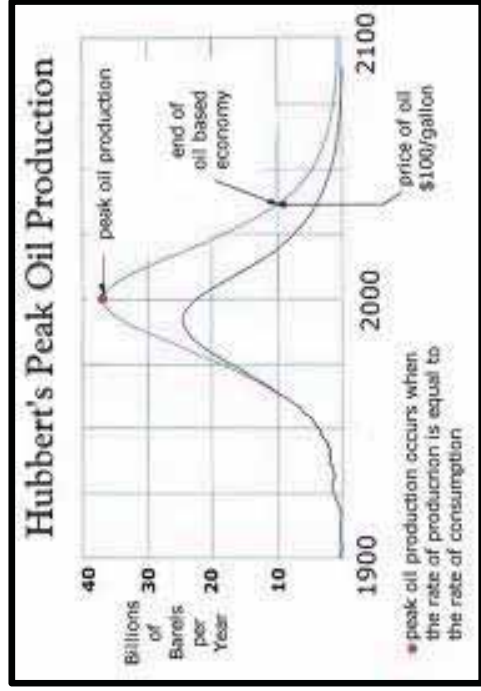
- Electricity
- Water
- Waste



WHY WE NEED TO CHANGE THE WAY WE DESIGN CITIES



Climate Change,
Peak Oil, Resource
depletion...



AN INCREASING FOCUS ON CITIES GLOBALLY

- Clinton Climate Initiative & C40
- Carbon Disclosure Project (CDP)
- World Mayors Council on Climate Change
- Cities for Climate Protection (CCP)
 - ICLEI – (International Council for Local Environmental Initiatives)
- Urban & Regional Carbon Management



CLINTON
CLIMATE
INITIATIVE

C40
CITIES
CLIMATE LEADERSHIP GROUP

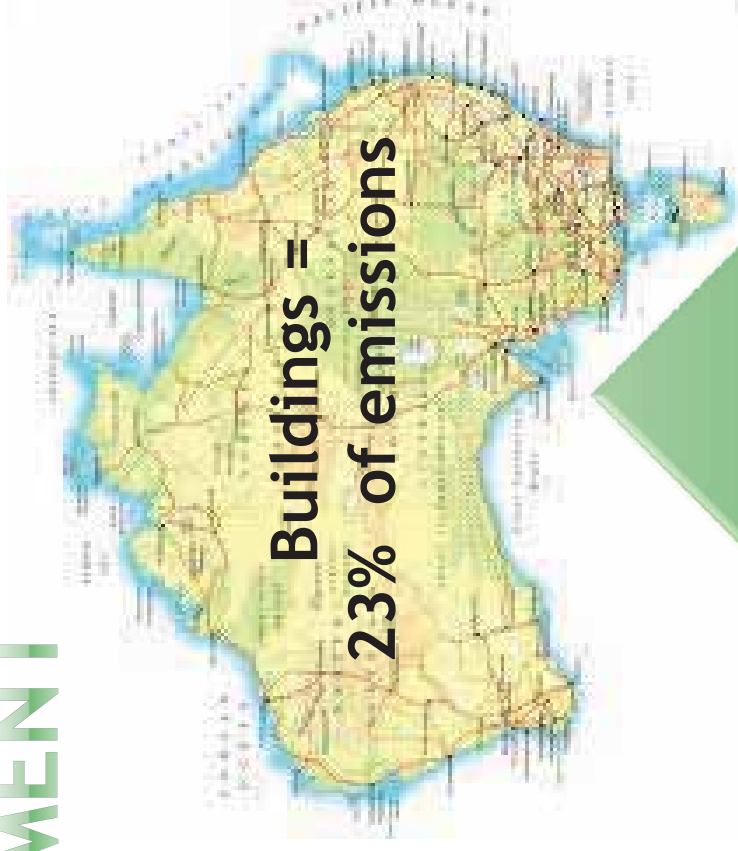


I.C.L.E.I.
Local
Governments
for Sustainability



DOMESTIC GOVERNMENT INITIATIVES

- **Federal**
 - Solar cities
 - \$80 million for low carbon communities
 - Carbon Trust
 - Energy Efficiency Trust
 - \$80 million funding
- **State**
 - ZEN – Zero Energy Neighbourhoods (VIC)
 - Living Smart
- **Local**
 - ICLEI – Carbon Neutral
 - Stirling City Redevelopment
 - Sydney Green Transformers



Abundant energy
efficient abatement
opportunities in built
environment

McKinsey & Co. 2008, ASBEC 2009, Climate Works 2010

PRECINCT SCALE THE FOCUS OF NEW TOOLS

◎ BREEAM COMMUNITIES

BRE Environmental Assessment Method UK

◎ LEED ND

Leadership in Energy & Environmental Design -
Neighbourhood Development USA

◎ GBCA COMMUNITIES

Green Building Council of Australia (under
development)



- CATSS report on community
scale sustainability tools



INTERNATIONAL FEDERATION
OF LANDSCAPE ARCHITECTS



Australian Institute
of Landscape Architects

CLIMATE ADAPTATION TOOLS FOR SUSTAINABLE SETTLEMENTS (CATSS) REPORT

An Australian Institute of Landscape Architects (AILA) project in consultation with:
the International Federation of Landscape Architects (IFLA),
and
Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia.

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The Climate Adaptation Tools for Sustainable Settlements (CATSS) project,
2009-2010 has been assisted by
the Australian Government through
The Commonwealth Department of Climate Change and Energy Efficiency

“REPORT TO THE PRIME MINISTER TASK FORCE ON ENERGY EFFICIENCY”

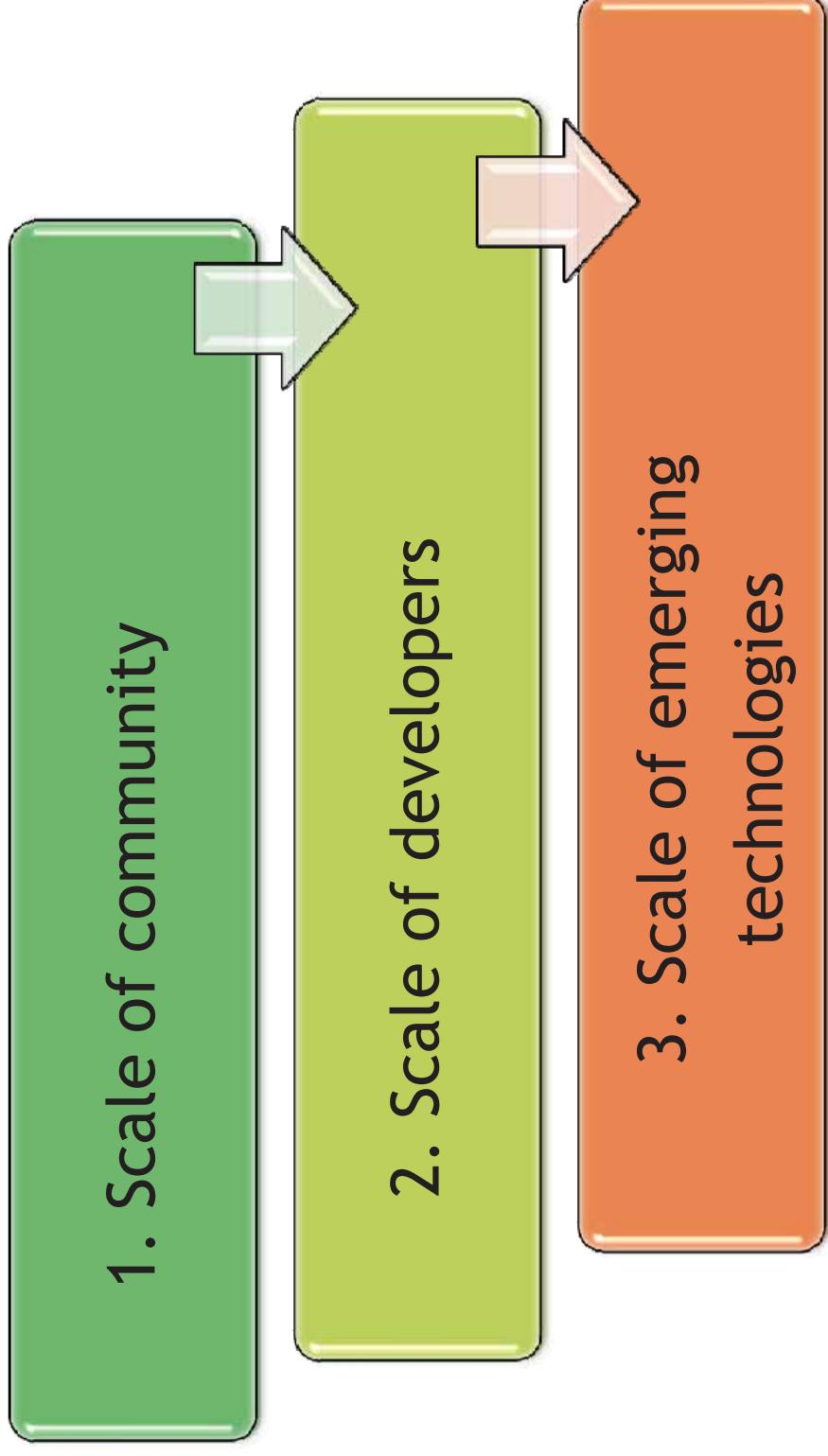


Identified the need for
“energy efficient
hubs”

Why this focus?



MOST OPPORTUNITIES AT PRECINCT LEVEL



DISTRIBUTED INFRASTRUCTURE

- Fewer/no transmission losses

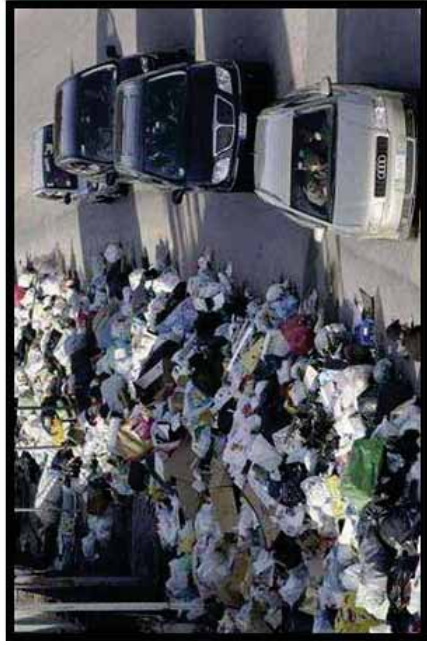
- Less demand on grid

- Reliability of supply

 - Diverse sources of power

- Greater efficiencies - when combined

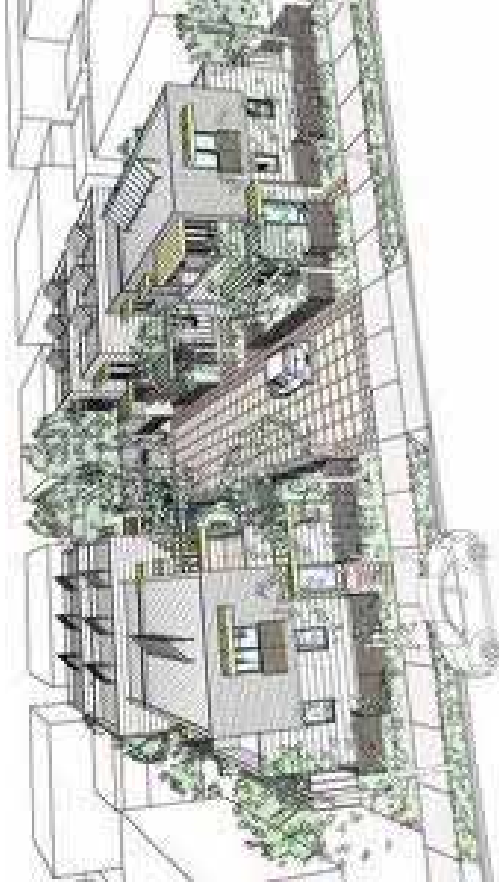
- Greater community awareness of resource consumption



CHARACTERISTICS OF A CARBON NEUTRAL PRECINCT...

1. DENSE, MIXED & GOOD DESIGN

Green roofs & facades

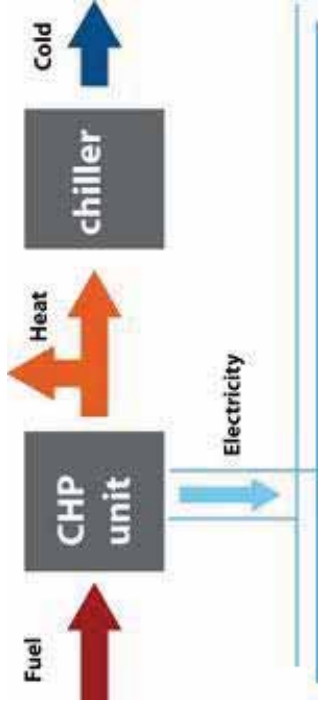


Solar orientation and walkable design



TOD Design - based around transport

2. DECENTRALISED SYSTEMS

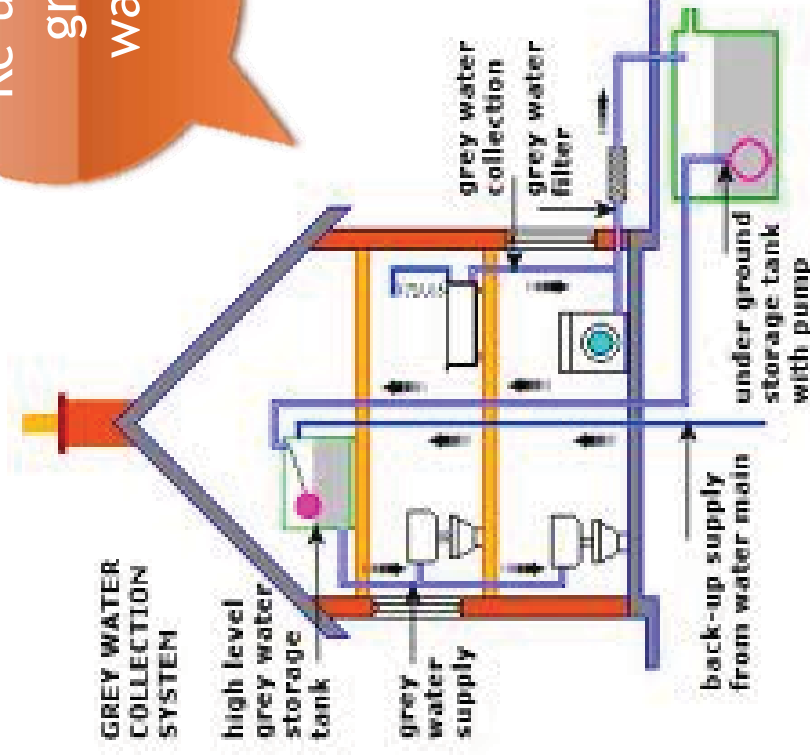


Medium to large scale co- & tri-generation - providing electricity, heating and cooling to local area



Small scale renewable energy

Re-use of grey water



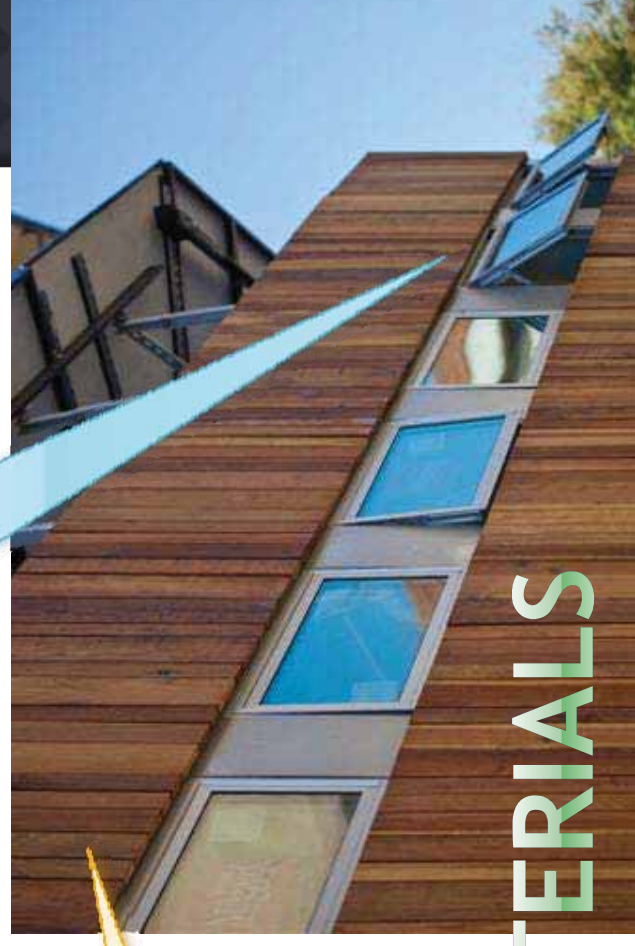
Recovery & utilization of waste to energy

3. SMART TECHNOLOGIES



Live energy monitoring, IHD's, smart meters & intelligent grids

Intelligent buildings - automatic functions



Recycled, re-used and renewable materials

4. LOW CARBON MATERIALS

IF WE KNOW HOW TO DO IT...

...Why aren't we doing it?

High capital cost
(long payback
periods)

Energy market
barriers

Split incentives



Barriers to carbon neutral communities

Lack of
information

First mover
disadvantage

Policy & pricing
uncertainty

Longer approvals
process

OPTIONS TO OVERCOME BARRIERS



Helps reduce risk to developer & ensure desired outcomes are achieved

- Government to lead
- Energy Service Companies (ESCO's) to manage systems
- Property Assessed Clean Energy (PACE) financing
- Deregulate the energy market
- Reward early mover - provide incentives...
 - “Green door” - fast track approvals process
 - Land Tax exemptions

PACE FINANCING

“Property assessed
Clean Energy”
Financing

ESCO identifies energy efficiency opportunities within a precinct

Apply for approval to local council

If approved, ESCO applies for funding through financier with payback being provided through increased land rates for owners

Allows upfront capital costs to be spread over 20 years or so with investment costs being attached to property rather than to a person

GOVERNMENT FRAMEWORK

- ◉ Innovations require a government framework
- ◉ Deals without substance lead to credibility issues

ACCREDITING INNOVATIVE DEVELOPMENT



...So if developments can achieve/demonstrate innovation, can it be recognised?

CURRENT ACCREDITATION

- Green Star Communities (under development)
- Envirodevelopment (UDIA)
- SPEAR (ARUP)
- LESS (Hassell)
- ISAP (CSIRO)
- SSIM (AECOM)
- PRECINX (Landcom)

Great for rating **sustainability!** - but few actually measure the specific carbon content or emission savings

The need for a quantitative carbon assessment
framework...

CATSS REPORT

“A significant area of concern which has emerged from this analysis is the general lack of robust indices for measuring urban environment’ performance as a key infrastructure’ performance as a key component of overall urban sustainability.”

GREEN BUILDING COUNCIL OF AUSTRALIA (GBCA)

“What is the national standard for calculating greenhouse gas emissions in development projects? It doesn’t exist.”

Adam Beck, 2010

BROOKFIELD MULTIPLEX

The need to align carbon emission data collection for comparability

“What is that data? Who reports it and what’s the comparability? That’s the problem in industry right now... There’s not an international standard. It doesn’t mean a lot if somebody else is doing it completely different...that’s what business really needs”

Lauren Haas, 2010

No universal comprehensive
framework for calculating GHG
emissions associated with urban
development...



LACK OF FRAMEWORK = SCEPTICISM AND “GREENWASH”

And a crack down by
the ACCC!

- Developments around world claiming all sorts of things...
 - most commonly ‘carbon neutrality’
- But what emissions are calculated?
 - Operational emissions?
 - Full life cycle?



NPQ - a prime example of the need for a framework for calculating emissions

ARC LINKAGE PROJECT DECARBONISING CITIES AND REGIONS

Aim: To develop a national carbon neutral accreditation scheme for urban and regional land development, which can be used to influence policy decisions and assist Australia in the transition to a low carbon future

PROJECT AREAS



- 1. Urban Redevelopment & Subdivisions
- 2. Urban New Development




- 3. Remote Aboriginal Communities
- 4. Mining Camps



5. Accreditation, Policy & Governance

DEFINING THE BOUNDARY:

1. Construction
2. Embodied energy in materials
3. Operational energy
4. Water
5. Waste
6. Transport
7. Decommissioning?



Distributed
infrastructure versus
conventional supply

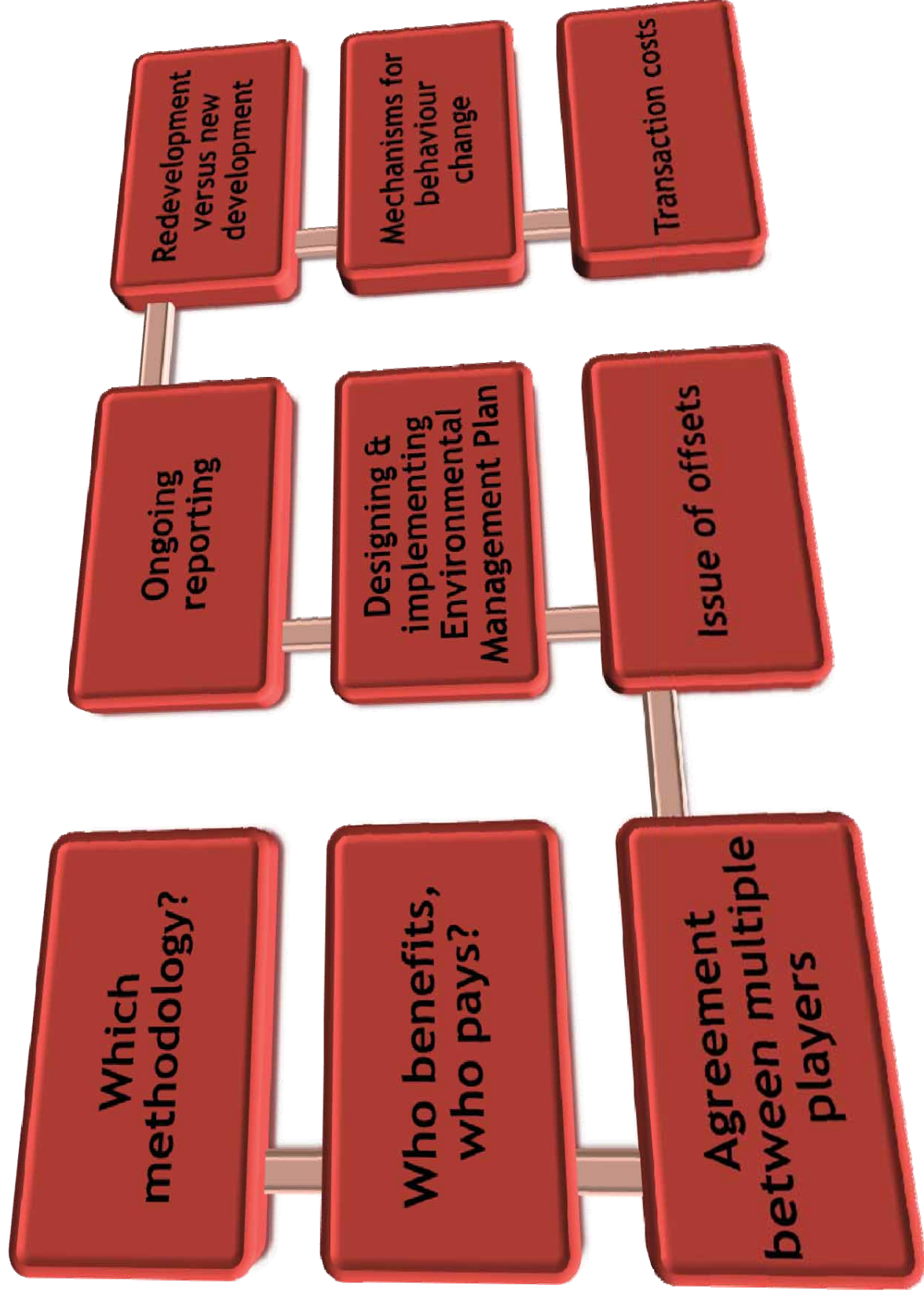
NCOS & THE CNPG

- ◉ *National Carbon Offset Standard and the Carbon Neutral Program Guidelines*
- ◉ Replaced Greenhouse Friendly
- ◉ Largely based on the CPRS
- ◉ Brings credibility to concept
- ◉ General steps in gaining certification
 - Measure emissions
 - Write an EMP outlining reductions
 - Offset emissions etc
- ◉ 5 year accreditation period

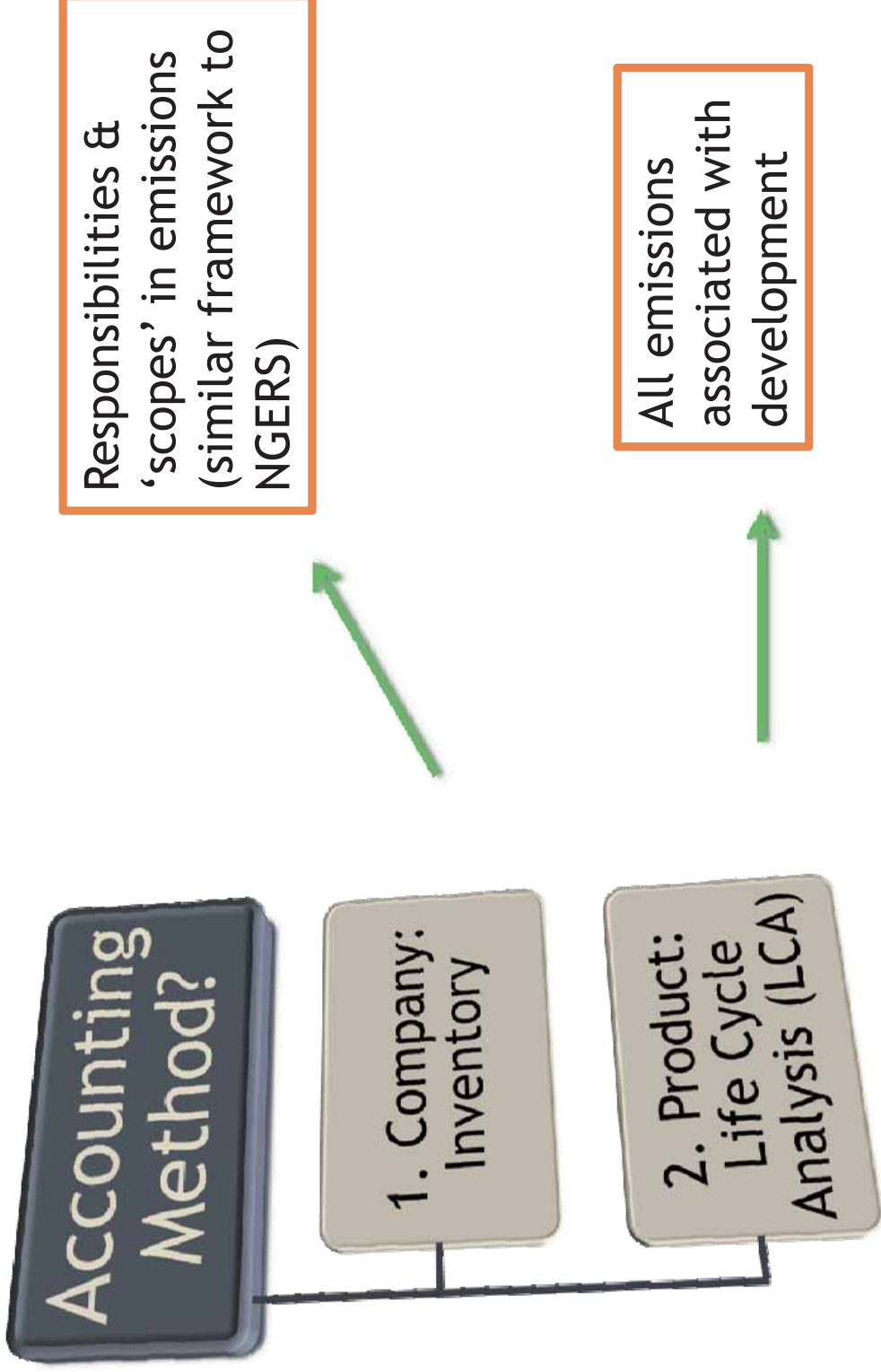


...But not completely relevant and applicable for land development

ISSUES FOR LAND DEVELOPMENT UNDER NCOS...



ACCREDITATION - WHICH METHOD?



CARBON NEUTRALITY:

Panacea or over the top?

- ◉ Regardless of carbon neutrality, still need decarb framework...
- ◉ A framework & methodology can:
 1. *Help to assess decarbonisation measures*
 2. *Help to compare carbon claims - ACCC*
 3. *Allow for incentives/rewards*
 4. *Provide basis for future carbon/energy efficiency trading schemes*
 5. *Allows sector targets to be developed*
- ◉ Ongoing reporting critical to determine success of measures

FURTHER RESEARCH

- Investigate who should be responsible for accreditation & ongoing reporting
- Develop specific:
 - **Methodology** for assessing/calculating emissions and;
 - **Guidelines** and tips including:
 - *Financing options*
 - *How to encourage collaboration between multiple players*
 - *Owner/occupier arrangements*
 - *Incentives for low carbon developments*
- Investigate carbon trading opportunities for the built environment

Thank you!

Questions?

