Green Buildings and Greening Infrastructure; – a Shared Framework?

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Programme Manager; cidb
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Overview

• Policy assessment:
  – “from intent to action”

• Regulation, Codes, Standards, Measurement and Assessment Tools, Guidelines, ....:
  – “how green is my infrastructure”

• Green Buildings:
  – emerging policy framework
  – monitoring

• Towards a policy framework for green infrastructure

• Concluding comments
Policy Assessment

“from intent to action”
Regulatory instruments and control instruments, such as building codes and appliance standards, are both most effective and normally also most cost-effective.

## Policy Instruments

<table>
<thead>
<tr>
<th>Policy instrument</th>
<th>Emission Reduction Effectiveness</th>
<th>Cost-effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appliance standards</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Building codes</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Energy efficiency certificate schemes/white certificates</td>
<td>Medium</td>
<td>High/ Medium</td>
</tr>
<tr>
<td>Labeling and certification programs</td>
<td>Medium/ High</td>
<td>High</td>
</tr>
</tbody>
</table>
Regulation, Codes, Standards, Measurement and Assessment Tools, Guidelines, ....

“how green is my infrastructure?”
Green Regulations, Codes, Standards, .....
Green Rating, Labelling & Certification

Buildings
Green Rating, Labelling & Certification

- EU Union Directive 2002/91/EC for energy performance certificates for buildings provides for reference values such as current legal standards or other benchmarks

- Green buildings:
  - energy, GHG, water

- Green infrastructure:
  - impact vs consumption
  - range of metrics / benchmarks required
  - complex
Green Rating, Labelling & Certification

Buildings
Green Star SA Office

- Management
- IEQ
- Energy
- Transport
- Water
- Materials
- Land use & ecology
- Emissions
- Innovation
Green Rating, Labelling & Certification

Buildings

Infrastructure
• Mandatory requirements
• Environment & water
• Access & equity
• Construction activities
• Materials & resources
• Pavement technologies
• Custom credits
Green Rating, Labelling & Certification

Buildings

Infrastructure

Neighbourhoods
LEED - ND

- Smart location & linkages
- Neighbour pattern & design
- Green infrastructure & buildings:
  - construction activity pollution prevention
  - site disturbance
  - contaminant reduction
  - stormwater management
  - heat island reduction
  - on-site energy generation
  - on-site renewable energy sources
  - district heating & cooling
  - infrastructure energy efficiency
  - wastewater management
  - recycled content
  - ......
Green Guidelines, .......

Buildings

Infrastructure
Green Buildings;
An Emerging Policy Framework
An Emerging Strategy

• Stakeholder:
  – public
  – private
An Emerging Strategy

- **Stakeholder:**
  - public
  - private

- **Sector:**
  - non-residential
    - commercial, education, health, ....
  - residential
    - non-subsidy, subsidy
An Emerging Strategy

- **Stakeholder:**
  - public
  - private

- **Sector:**
  - non-residential
    - commercial, education, health, ....
  - residential
    - non-subsidy, subsidy

- **Stock:**
  - new (design)
  - existing (operation)
Emerging Strategy; Commercial Buildings
Emerging Strategy: Commercial Buildings

- Energy Efficiency
  - Regulations SANS 10400XA; Minimum Standard

Public Sector

Private Sector

New

Existing

New

Existing

Private Sector

Existing

New

Public Sector

New

Existing

Public Sector

New

Existing

SANS 10400-XA: 2011
SOUTH AFRICAN NATIONAL STANDARD

The application of the National Building Regulations
Part X: Environmental sustainability
Part XA: Energy usage in buildings
Emerging Strategy; Commercial Buildings

Public Sector

- Energy Efficiency Regulations SANS 10400XA; Minimum Standard

Private Sector

- Energy Efficiency Regulations SANS 10400XA; Minimum Standard

New

Existing
Emerging Strategy; Commercial Buildings

Public Sector
- Energy Efficiency Regulations SANS 10400XA; Minimum Standard
- 4Star Green Star SA Certification; Best Practice

Private Sector
- Energy Efficiency Regulations SANS 10400XA; Minimum Standard

New
Existing

Public Sector
Private Sector
Emerging Strategy; Commercial Buildings

- Energy Efficiency Regulations SANS 10400XA; Minimum Standard
- 4Star Green Star SA Certification; Best Practice

Public Sector

New

Leadership

Existing

Private Sector

- Energy Efficiency Regulations SANS 10400XA; Minimum Standard

Public Sector

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- Energy Efficiency Regulations SANS 10400XA; Minimum Standard
Emerging Strategy; Commercial Buildings

Public Sector

New

• Energy Efficiency Regulations SANS 10400XA; Minimum Standard

• 4Star Green Star SA Certification; Best Practice

Existing

• Energy & Water Performance Certificates

Private Sector

• Energy Efficiency Regulations SANS 10400XA; Minimum Standard
### Emerging Strategy; Commercial Buildings

<table>
<thead>
<tr>
<th>Public Sector</th>
<th>Private Sector</th>
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<tr>
<td><strong>New</strong></td>
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<td>- Mandatory retrofitting below thresholds?</td>
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### Emerging Strategy; Commercial Buildings

#### Public Sector

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#### Private Sector

- • Energy Efficiency Regulations SANS 10400XA; Minimum Standard

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**Source:** cidb development through partnership
### Emerging Strategy; Residential

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<th>Non-Subsidy Sector</th>
<th>Subsidy Sector</th>
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[Image: cidb development through partnership]
Green Buildings; Monitoring
Monitoring


http://www.cidb.org.za
http://www.unep.org/sbci
UNSP-SBCI SB Index

• ... a globally consistent framework to understand, measure and report the influence of the performance of the building stock on core sustainability issues

• .... a tool to support the generating of annual reports on progress made by jurisdictions in improving the sustainability of building stock
## UNSP-SBCI SB Index (Draft)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Measure</th>
<th>Policy Instrument</th>
<th>Scope</th>
</tr>
</thead>
</table>
| GHG Emissions; Building Operations            | **Minimum requirement:** • kg/CO$_2$e/yr  
   • Optional requirement: • kg/CO$_2$e/UNIT/yr, where UNIT = • per area • per capita • per economic unit | **Mandatory policy instruments with a likely substantive impact**                                      | • GHG emissions arising from the building operations .....  
   • Policy and regulatory impacts on GHG emissions arising from the building operations |


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<td>Water Use; Building Operations</td>
<td>Minimum requirement:</td>
<td>Mandatory policy instruments with a likely substantive impact</td>
<td>All water used within the building systems ......</td>
</tr>
<tr>
<td></td>
<td>• kl/yr or tonne/yr</td>
<td></td>
<td>• Policy and regulatory impacts on water use arising from the building operations</td>
</tr>
<tr>
<td></td>
<td>Optional requirement:</td>
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<td>• per capita</td>
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<td>• per economic unit</td>
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Green Infrastructure; Towards a Policy Framework
Green Infrastructure; Class

- **Public:**
  - transport
    - road, rail, port
  - water
    - storage, bulk supply
  - energy
    - generation, distribution
  - waste
  - ...

- **Private:**
  - manufacturing
  - mining
  - telecoms
  - commercial
  - ....
Green Instruments / Tools

- Regulation, Codes, Standards:
  - impact: EIA, pollution, waste, recycling, noise, ...
  - design / operation: ?

- Measurement and Assessment Tools:
  - rating: Greenroads, LEED ND, AGIC, ....
  - labelling & certification: ?

- Guidelines:
  - FIDIC PSM, .....
Towards a Regulatory Framework

• **Stakeholder:**
  – public
  – private

• **Sector:**
  – transport, water, energy, waste, ...
  – manufacturing, mining, telecoms, commercial, ....

• **Stock:**
  – new (design)
  – existing (operation)
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<td>• Minimum requirements</td>
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<tr>
<td></td>
<td>• Best practices</td>
<td></td>
</tr>
<tr>
<td>Existing</td>
<td>• Minimum standards / benchmarks:</td>
<td>• Minimum standards / benchmarks:</td>
</tr>
<tr>
<td></td>
<td>• impact?</td>
<td>• impact?</td>
</tr>
<tr>
<td></td>
<td>• consumption?</td>
<td></td>
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Towards a Regulatory Framework

• For each infrastructure class
Monitoring

Stone, sand and gravel extraction: construction output and extraction of construction materials, 1990 to 2008

What are the metrics?

Measuring progress
Sustainable development indicators 2010
Concluding Comments
Concluding Comments (i)

• Regulation & control is a key driver
• Instruments & tools are being developed:
  – regulation, codes, standards, ..
  – measurement and assessment tools
    • complex for green infrastructure
  – guidelines
• Green building framework is developing:
  – complex for green infrastructure
    • stakeholder, infrastructure class, new/existing
• Green building monitoring systems developing:
  • complex for green infrastructure
    – what are the metrics
Concluding Comments (ii)

• Incremental approach is required for green infrastructure:
  • stakeholder, infrastructure class, new/existing
Thank You