Green building interventions for social housing

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Purpose of the research report

• Link the social housing sector of countries with green building interventions
• Identify instruments for promoting greening of the social housing sector at legislative, institutional, financial and technical levels.
• Assess the current situation and practices
• Provide recommendations and inspiration for new countries to invest in green social housing programmes

Methodology adopted

• A critical review and systematic analysis of international literature
• Review of policy instruments on greening social housing sector.
• An analytical framework to assess and summarise best practice and less effective case studies of green social housing projects located in different countries in the world.
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Imperative for sustainable social housing

• Population growth and urbanisation is leading to housing shortage.

• Globally about 1.6 billion people live in substandard housing, of which 1 billion people live in urban slums.

• World’s most populous regions (developing nations) run the risk of locking their economies into inefficient building stock for decades.

• Solutions must address the crisis of affordable (social) housing which also acknowledges the parallel crisis of climate change.
Dynamic relation between people, buildings and climate?

Dynamic three-way interaction between climate, people and buildings dictates our energy needs in buildings.

(Source: Professor Fergus Nicol, 2008)
Green building technologies and practices

• Passive solar design
• User engagement
• Community participation
• Resource efficiency: local materials and methods of construction
• Cultural characteristics
  • Courtyards
  • Verandas
  • Semi-private spaces
• Flexibility and scalability of design
  • Designed for reuse
  • Recyclable materials
• Incorporation of renewables
## Policy instruments and barriers

<table>
<thead>
<tr>
<th>Barrier Category</th>
<th>Example policy Instruments as Remedies</th>
</tr>
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<tbody>
<tr>
<td>Economic Barriers</td>
<td><strong>Regulatory:</strong> Appliance standards, building codes, energy efficiency obligations, mandatory labelling, procurement regulation, DSM programs</td>
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<tr>
<td></td>
<td><strong>Fiscal instruments:</strong> Taxation, public benefit charges, tax exemptions, subsidies/ rebates/grants</td>
</tr>
<tr>
<td>Hidden Costs/ Benefits</td>
<td><strong>Support action:</strong> Public leadership programs</td>
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<tr>
<td></td>
<td><strong>Economic instruments:</strong> EPC/ESCOs,</td>
</tr>
<tr>
<td>Market Failures</td>
<td><strong>Economic instruments:</strong> EPC/ESCOs, cooperative procurement, energy efficiency certificates, Kyoto flexibility mechanisms</td>
</tr>
<tr>
<td>Cultural/ Behavioural Barriers</td>
<td><strong>Support / information / voluntary action:</strong> Voluntary labelling, voluntary agreement, public leadership programs, awareness raising, detailed billing</td>
</tr>
<tr>
<td>Information Barriers</td>
<td><strong>Support / information / voluntary action:</strong> Voluntary labelling, voluntary agreement, public leadership programs, awareness raising, detailed billing, mandatory labelling, procurement regulations, DSM programs, mandatory audits</td>
</tr>
<tr>
<td>Structural/Political</td>
<td><strong>Support action:</strong> Public leadership programs</td>
</tr>
</tbody>
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Ten case studies: Analytical framework

- New build or refurbishment
- Number of dwellings
- Dwelling size
- Cost for case study vs. business as usual
- Policy instruments involved in process
- Financial models
- Cost to residents
- Subsidies
- Sustainability innovations
- Behaviour change activities
- Community awareness and engagement
- Community interactions
- Post-construction evaluation
Learning from the case studies

- To ensure **successful passive design**, it is best to imagine the home will have no power. Understand the sun, wind and light of the site.

- If relocating, areas well-served by transportation are important for **access to potential work, schools, and healthcare**.

- Serious consideration for upgrades must be made when bringing occupants out of slums or conditions where they were **not previously responsible** for fuel, water or sewage bills.

- Unseen or unfashionable material or methods **require more effort** in convincing occupants of uptake or acceptance.

- **Demonstration or mock-ups** of housing units can be helpful in convincing residents **to accept new ideas**, and in assisting builders in understanding new construction methods or working with new materials.

- **Involvement of the future occupants** in the planning and building process has been shown to be crucial in the success of a number of projects:
  - Involvement gives occupants the sense of ownership, provides skills and ensures a level of understanding in what they will be receiving.
Causes for failure of some ‘sustainable’ social housing projects

• **Cost of living**: People living in slums do not have energy or water bills. Even if the new housing is provided for free, utility services such as electricity, gas, water or waste disposal can create financial problems for the occupants.

• **Location**: Social housing projects fail when they are built too far from town without regular and affordable transportation links.

• **Suitability**: Inappropriate design for climate or cultural expression can cause failure. Local understanding is essential.

• **Role of the government**: government can fail the social housing recipients by not asking about and not listening to the needs of the future occupants.

• **Multi-stakeholder approach**: Failure can occur by not involving local stakeholders in the process. Stakeholders such as, those in the private sector, NGOs and the recipients members, all have something to contribute to the longevity and success of a project.
Some key messages

• Keep the design simple but adaptable and flexible; mocks can help.
• Unseen or unfashionable material or methods require more effort in convincing occupants of uptake or acceptance.
• In growing urban locations, incentivise social housing development in areas of the city, well-served by transportation so that occupants can access work opportunities, schools, healthcare and other amenities.
• Planning and implementation of sustainable housing developments are significantly more effective when the communities are involved from inception through all phases.
• Adopt life cycle costs, not just the initial costs of construction.
• Monitoring and evaluation can provide confidence in the outcome and benefits of green social housing – this can help with scaling-up.
• For large multi-project developers, post-occupancy evaluation is important to understand how the building performs compared to expectations.
• Experiences should be disseminated and shared – both successes and failures are useful for collective learning.