

# Centre for a Sustainable Built Environment

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Faculty of the Built Environment, The University of New South Wales

**Submission to the Discussion paper *Sustainable Cities 2025* for the House of Representatives Standing Committee on Environment and Heritage.**

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## CSBE Submission to the Discussion paper *Sustainable Cities 2025* for the House of Representatives Standing Committee on Environment and Heritage.

The Centre for a Sustainable Built Environment (CSBE), University of New South Wales welcomes the opportunity to comment on the *Sustainable Cities 2025* discussion paper. This submission deals specifically with sustainability objectives 2 and 6 as listed on page 4 of the discussion paper. We have recommended adding another objective, designated as objective 8 – Monitoring and Feedback. A description of this objective, questions for consideration and an example have been included in this submission.

### General Comments

The CSBE recognize the imperative to achieve sustainable cities. In saying this we consider there to be a need to present a vision for achieving this aim (presumably by 2025), which is integrated, that operates within a holistic understanding of the features of a sustainable city. Within the discussion paper there is a lack of integration between the terms of reference listed on page 3 and the “future vision” described by the boxed objectives on page 4. A unified framework for a policy is required.

The following comments relate to the vision of a sustainable city described on page 4 of the discussion paper.

- Sustainability is an emergent quality of a city. It is not a perfect future state. It is also an imperative. The ‘visionary objectives’ contained in the discussion paper represent a ‘weak-sustainability’ ideal. This is not consistent with what is possible given current levels of knowledge on urban and ecological sustainability. We can afford to be more visionary (and can’t afford not to be) than the discussion paper’s definition of a sustainable Australian city describes.
- That which requires sustaining must be made explicit. Sustaining the health of ecosystems, sustaining life-quality, sustaining favorable climatic conditions, sustaining availability of meaningful employment, sustaining access to health-care and education for example, are all important goals for sustainable cities.
- The scale of ‘city’ should be defined. A city of Melbourne or Sydney scale raises different issues to those raised by a city the size of Newcastle or Geelong. There are also cities within metropolitan areas that link urban and suburban scales.
- The location of a city is another key factor in determining what strategies and features will lead to sustainable cities. The bioregion, ecosystems and climate zone in which a city is located for example, create unique priorities for developing sustainability. Measures for developing sustainability must be relevant to local cultural, economic, social and ecological conditions.
- Change must be accepted as an organizing feature of sustainable cities. Environmental, social and economic conditions will change and cities must be adaptable in order to remain viable. A city must therefore sustain the quality of *resilience* by maintaining and fostering diversity and ensuring that self-organisation through feedback, learning and innovation is occurring.

- Feedback mechanisms such as indicators of sustainability, indicators of positive change, indicators of environmental performance, monitoring programs, performance assessments and reporting processes are essential strategies. We recommend adding 'Feedback Mechanisms' to the list of seven features of a sustainable city listed on page 4.

### ***Ensure equitable access to and efficient use of energy, including renewable energy sources.***

There is little doubt that there are significant concerns about the current energy supply options and the nature, mix and growth in demand for energy. Whereas it is easy to understand the reasons for the current mix of energy supply (based mainly on carbon intensive coal based forms) it is anything but clever to recognise its unsustainable attributes and not move quickly to more sustainable mix. In addition to environmental and social benefits of change there is good economic rationale as well.

Taking leadership in change provides immense opportunities for industry development, employment generation and export potential as well. On the demand side there is overwhelming evidence of inefficiency in most sectors but there is even greater concerns about increasing inefficiency in use as well as increasing per capita energy use in urban areas. Possible impact on local area transformer systems of uncontrolled increases will see the repeat of the recent New York power failures in western Sydney. Peak demand growth alone needs particular consideration. This is also a function of increasing house sizes and high use of mechanical systems for comfort rather than simple passive solar designs.

Cities and all urban districts provide opportunities for integrated planning which deals with both demand side efficiencies and decreasing overall and peak load demands as well as decentralised integrated supply systems close to point of use and more in tune with nature of demand. There is clear need for a mix of strategies including education, regulation and incentives. There needs to be a commitment at all levels of government to policy which drives change at an accelerated pace and helps create a more sustainable society which values quality of life of this generation as well as future ones. Some work is evident at all levels of government but a lot more is needed.

*Some suggestions for governments include:*

Policy that promotes decentralised supply options such as photovoltaics, biogases, wind and fuel cells. These technologies are at early adoption stages and need levels of government subsidies that not only ensure faster adoption but industry development as well. Integration of photovoltaics alone would not only provide green electrons generated on site but would also have positive urban aesthetic impacts. Renewable options should be promoted for all sectors of the economy and all types of buildings and consumers and only selective targeting would not work - needs a whole of economy and holistic approaches.

Impediments to higher uptake of more sustainable energy options include inadequate government support for emerging technologies (lack of foresight), lack of end user education about triple bottom line benefits (TBL), lack of professional education on innovative use of such technologies and regulatory framework for implementation. All these need to be addressed and not just any one by itself. There are positive TBL impacts of rapid escalation in use of sustainable energy options.

Energy planning should look at both supply and demand side issues together rather than in the current disjointed manner. Higher efficiency standards should be mandated for all buildings. Great care needs to be taken in selecting tools for assessment of efficiency and targets for improvements as there are many in the market which have little to no scientific credibility but have been pushed by governments as measures. Inappropriate tools and standards often have negative impacts such as the lack of control on increasing house sizes while still conforming to a energy index based on 'per meter squared energy use'.

Sustainable transport is an integral part of sustainable energy policy. Policy that pushes manufacturers to improved efficiencies including lighter bodies and higher engine performance (Factor 4 opportunities) as well as fuel substitution is needed in the short term to accelerate improvements.

Change towards a more sustainable energy use can be demonstrated to have triple bottom line benefits that outweigh costs and over a life cycle basis is much superior pathway for Australia rather than a business-as-usual or small incremental change.

### ***Incorporate eco-efficiency principles into new buildings and housing***

Existing building stock accounts for most energy and resource consumption associated with the built environment. A sustainable city must have systems in place to monitor and improve the environmental performance of existing buildings as well as encouraging eco-innovation of new buildings. The guiding framework for improving new AND existing building and housing, should be sustainable design principles, rather than principles of eco-efficiency (refer to Table 1).

The construction industry is a major consumer of natural resources and therefore many of the initiatives pursued in order to create sustainable buildings are focusing on increasing the efficiency of resource use. The ways in which these efficiencies are sought are varied.

Examples range from the application of solar passive design, which aims to reduce the consumption of non-renewable resources for energy production, life-cycle design and design for deconstruction, minimising material wastage during the construction process, and providing opportunities for recycling and reuse of building materials and components.

However, resource depletion can only be slowed and never eliminated by resource efficiency. This has lead some theorists and researchers<sup>ii</sup> to consider resource efficiency a conservative response to environmental problems.

Eco-efficiency is a necessary step, but alone cannot lead to sustainable outcomes.

*"Eco-efficiency – doing more with less – is an outwardly admirable concept. But it works within the industrial system that originally caused the problem. It presents little more than an illusion of change."<sup>iii</sup>*

There is a need to have a larger goal. For example "a small ecological footprint for 2025 and onwards" of new and existing building stock. This would mean having strategies that deliver goods and services in line with earth's carrying capacity. Eco efficiency can then be deployed as a strategy (and not a vision) to progressively reduce impacts and resource intensity while bringing

about quality of life (and of-course with competitively and attractively priced amenities and goods - as per the definition by WBCSD, World Business Council for Sustainable Development)<sup>iv</sup>.

Eco-efficient Buildings:-	Sustainable Buildings:-
Do more with less Minimise waste Minimise pollution Reduce, Reuse, recycle	Turn waste into resources Are life-cycle designed Protect and enhance biodiversity Consume within ecological carrying capacities Encourage learning & innovation Easily adapt to change Respond to their context

**Table 1:** *Examples of the difference between eco-efficient principles and sustainable design principles. Sustainable buildings are designed to eliminate waste and pollution rather than just minimize them. Sustainable buildings allow people to learn from, adapt and affect positive change, rather than only aiming to reduce rates of negative change.*

The standing committee should focus on a whole-of-industry response, recognizing that the vast majority of construction activity is small to medium-sized and conducted by small firms. There should be varied sustainability goals to reflect the difference in priorities and contextual settings of buildings, while contributing to the overall vision for sustainable Australian cities.

The following could facilitate developing and implementing building practices that contribute to sustainability:

*Regulation:*

Work toward Building Code of Australia amendments that extend minimum performance standards for buildings beyond energy performance towards more holistic consideration of environmental performance. Industry precedents that could be used as starting points for BCA amendments include the Australian Green Building Council 'Green Star' scheme for new commercial buildings, Planning NSW BASIX rating for new residential buildings, and Melbourne Docklands authority's ESD checklists.

The process of 'Greening' NATSPEC should continue to be supported. In addition there is a need to establish third-party certified eco-labeling for building materials and products. The timber industry in Australia for example, needs support to establish chain-of custody and sustainability certification for timber building materials and products, particularly sawn timber. The lack of third-party certification is beginning to reduce the confidence of specifiers to select timber. This is reflected in material choice criteria used in new Building rating schemes such as 'Green Star' and NABERS to award materials credits only to buildings that use certified sustainable timber (which currently must be imported because Australia does not yet have an accepted certification program) or soft-wood plantation timbers.

Sustainability goals embodied in planning requirements should be able to reflect local government, community and environmental priorities. However, the process of gaining approval, including

establishing minimum benchmarks for building performance should be established. Increasing the understanding of planning approval requirements for sustainability will reduce the perceived risks associated with innovative design.

In addition planning and building approval should be based on achieving a five-star life-cycle design rating ensuring that all new building has considered:

- Design for deconstruction
- Materials cycles planning
- Modular design & dimensions
- Avoidance of composite materials
- Specification of salvaged materials
- Specification of materials with recycled content
- Specification of reusable or recyclable material
- Specification of materials with low ecological rucksack
- Construction site waste minimisation plan integrated into an environmental management plan.

#### *Carrots:*

Provide financial incentives for positive change. For example, encouraging local governments to expedite planning and building applications and provide discounts on fees for buildings that contribute to sustainability.

Tie first-home buyer/builder grants to the purchase or construction of sustainable buildings.

Encourage financial institutions to provide 'green' finance for building developments that contribute to sustainability. Environmentally high performance buildings can be less expensive to run and to maintain. These types of buildings are potentially carry less financial risk, and greater potential for profitability.

Encourage the development of markets for salvaged building materials. Sustainable design principles should become prequalification requirements for all government projects.

Encourage demand for sustainable building by promoting benefits such as increased amenity, lower operating costs, increased health and well-being. Media campaigns and industry awards can be affective.

#### *Sticks:*

Increasing the costs associated with un-sustainable practice such as land-fill dumping of construction and demolition waste is an effective measure. The Netherlands for example passed legislation in April 1997, banning the dumping of reusable building waste. This has contributed to ensuring about 80% of materials in the construction and demolition (C&D) waste stream are reused in construction<sup>v</sup>. In Australia the construction industry directly reuses approximately 10% of all C&D waste. About a third of all C&D waste is dumped in land-fill, while approximately 60% is reprocessed for raw-materials in construction and other industries<sup>vi</sup>.

### *Research and Education:*

Education providers have a major role to play in creating environmentally literate building professionals. Infiltration of sustainability practices into work culture is also required. It is essential that building professionals and trades learn how to develop and use tools and methods for sustainable building.

Research funding for life-cycles of building materials and buildings in operation is required. There is a severe lack of current Australian building performance data. Case studies of the design and construction of Australian buildings in all locations and climate zones are also necessary. Case studies and integrated data gathering and analysis facilitated by tools such as the National Building Environmental Rating Scheme (NABERS) is essential. Research is also required to identify existing market and institutional barriers to sustainable building.

### ***Monitoring and Feedback***

**Monitor progress in constructing sustainable cities in Australia using a set of indicators reflecting the three domains of human interaction - environment, economy and place.**

Sustainability requires a constant reflection or feedback loop that supports decision-making. This feedback uses indicators to monitor the state and direction of the overall approach. Indicators are quantitative or qualitative information presented in a formalized way, often as a program or suite of indicators. Indicators are the only systematic way of tracking conditions and monitoring progress. There is nothing new about indicators – they have been used for decades to inform people and support policy change. Gross national product, cost of living, and employment statistics are three of the more common national indicators used in many countries.

Indicators provide representation given the scale of their application. Representation is enhanced with innovative approaches to application that incorporate quantitative and qualitative components of development. Currently, this innovation relates to the way suites of indicators are used in programs to monitor global, national, and community conditions. As a result of the Rio Declaration<sup>vii</sup> and commitments to Agenda 21 several European countries, Canada, and Japan are using sets of indicators at a national scale. Efforts to monitor global conditions have existed for several years as well. The United Nations coordinates the measurement of global problems like greenhouse gas accumulation and ozone depletion, whilst also constructing macro-indicator programs, such as the Human Development Index<sup>viii</sup>. Private organizations like *The Economist* (London) and The World-watch Institute are also important producers of composite indicators and data.

Alternatively, there has been a proliferation of community-based indicator programs in Australia through State of the Environment (SOE) reporting. SOEs are predominantly focused on physical processes within the natural environment. In the United States suites of indicators have been collected into community indicator programs (CIPs) that are used to monitor economic and environmental trends and also social well-being<sup>ix</sup>. CIPs are a particularly tangible way of measuring performance of community goals and represent a potential step towards tracking quality of life issues. Many researchers have commented on the ability of CIPs to heighten public awareness about community issues and on their value in helping to manage the policy process<sup>x</sup>.

If policy makers are serious about achieving the seven visionary objectives, they must be monitored. Monitoring is vital in assessing outcomes and is a tool that provides greater engagement for policy decision makers in the implementation process. However, it is also an effective engagement tool for community participation. Communities can support the implementation process through active participation in monitoring. A distributed network that facilitates monitoring by communities and non-government organizations would provide opportunities for capacity building within communities. Engagement in the planning and implementation process may act to strengthen the level of community ownership of planning outcomes.

### *Questions for consideration*

- Across all scales, what suitable indicators could be selected to represent the three areas of human interaction?
- How can a monitoring framework be used as a tool for education and capacity building for engaging the wider community?
- What scale or size should an indicator program be to provide adequate representation of all areas of human interaction?
- How can a program with a suite of indicators be best utilised as a monitoring tool, or used in association with tangible goals as a policy formulation tool?
- Should monitoring be conducted as a snapshot, or part of a continuously active evaluation process?
- What are the data implications for gathering information across larger scales?
- What is the relevance of SOE reporting in developing an inclusive and representative community monitoring framework?
- What initiatives can assist in engaging individuals in community based monitoring?



## Case study: Newcastle City Council's Sustainable Community Indicators

Newcastle City Council (NCC) is actively monitoring and providing policy feedback on the city's progress towards sustainability, through a community indicator program developed in conjunction with The Australia Institute.

*"Over the past decade Newcastle City Council has been actively involved in developing innovative responses to the challenge of sustainability. Sustainability incorporates economic, social and environmental attributes of the City as they affect the eco system's health and quality of life of community members. This project, to develop and report on Indicators of a Sustainable Community, has evolved from the sustainability management and community involvement objectives of Council and constitutes a critical stage in the process of clarifying, articulating and measuring the quality of life in Newcastle. The project affords an opportunity to encourage participation from a wide range of community stakeholders whose activities contribute to achieving an improved quality of life in the City. Community indicators are measuring systems developed, maintained and researched by community members. They provide communities with the economic, social and environmental information they require to inform them how they are progressing towards becoming a sustainable community."*<sup>xi</sup>

- The cleanliness of our beaches
- The quality of our community spaces
- The quality of our air
- The range of appropriate educational opportunities for all
- The unemployment level
- The availability of appropriate transport
- Conservation of local native plants and animals
- Availability of appropriate housing for all
- Community participation in decision-making
- The strength of our social support networks
- The community perception of safety
- Income levels
- Diversity of employment and industry sectors
- Cultural Robustness

**Table 2:** *Indicators used to reflect the quality of life in Newcastle, Australia.*

**Source:** Newcastle City Council 2003. *Sustainable Indicators Report*. Newcastle.

## Conclusion

The House of Representatives Standing Committee on Environment and Heritage is to be commended for their undertaking *Sustainable Cities 2025*. It is indeed a crucial time to reflect on this vision, and timely given the focus for 2004 as the Year of the Built Environment. The focus on the spaces we live in, and the interactions that comprise them, are intricately linked to the overall 'liveability' of our cities and settlements. 'Liveability' implies a consideration of the interaction between physical process and human decision-making. Planning for enhanced liveability and lifestyle opportunities are considered to be key components of a sustainable Australian city of the future. The key recommendations of this submission is to integrate the current vision with a holistic vision of sustainability and expanding the objectives to address the need for monitoring and evaluating the progress of implementation.

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## References

<sup>i</sup> Ernst von Weizsacker, Amory B Lovins and L Hunter Lovins (1997) *Factor 4 doubling wealth - halving resources use*. Allen & Unwin, Sydney

<sup>ii</sup> Eg; McDonough, B. & Braungart, (1998) "The Next Industrial Revolution" *The Atlantic Monthly* October and; Hawkin, P. (1993) *The Ecology of Commerce* Harper Collins New York, U.S.A..

<sup>iii</sup> McDonough, B. & Braungart, (1998) Op.Cit. p62

<sup>iv</sup> WBCSD, Eco-efficiency: Creating More Value with Less Impact, OCT 2000, WBCSD  
<http://www.wbcds.ch/DocRoot/02w8IK14V8E3HMlIFyue/EEcreating.pdf>

<sup>v</sup>Kibert, C.J. (2000) Deconstruction as an essential component of sustainable construction. In Boonstra, C., Rovers, R. & Pauwels, S. (eds) *International conference sustainable building 2000 proceedings*. 22-25 October, Maastricht, the Netherlands, AEnas Technical publishers. p89.

<sup>vi</sup> Tucker, S.N. Salomonsson, G.D. and MacSporran, C. (1994) *The Environmental Impact of Energy Embodied in Construction*. Second Report for the Research Institute of Innovative Technology for the Earth. CSIRO Division of Building, Construction and Engineering. Highette, Australia.

<sup>vii</sup> United Nations Conference on Environment and Development 1993.

<sup>viii</sup> Macro-indicator programs include those that describe 'North' and 'South' processes; whereas the Human Development Index aggregates a number of separate indicators into a composite measure.

<sup>ix</sup> Innes, J. E., and Booher, D., 1999. *Indicators for Sustainable Communities: A Strategy Building on Complexity Theory and Distributed Intelligence*. Working Paper 99-04, University of California, Berkeley, CA.

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<sup>x</sup> Reid, David 1995. *Sustainable Development: An Introductory Guide*. Earthscan Publications, London.

<sup>xi</sup> Newcastle City Council 2003. *Sustainable Indicators Report*. Newcastle.