Why A New Business Model Is Required For Sustainable Tall Building Design

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Tall buildings are seen by many as an adaptation strategy in response to our growing population and urbanisation. Today more than 50% percent of the world’s population lives in cities. By 2050 the population is predicted to reach 9 billion of which an estimated 70% will be living in cities. In this scenario it seems that the only way is up while at the same time slowing population growth over time.

Broadening the technology focused approach

Skyscrapers resonate with many as romantic endeavours. Putting their undeniable romanticism to one side, tall buildings also represent an opportunity to mitigate the adverse effects of population growth on resource use and the impact of urbanisation on biodiversity. High-density developments make it easier, and cheaper, to provide efficient mass transport, energy and water infrastructure and waste management among others.

These obvious technical and environmental advantages come at the cost of the limitations of privacy, access to open spaces and daylight, to name just a few challenges. In densely populated cities quality of air may also take on added significance.

While constraining urban sprawl through high density living is desirable from the broad sustainability point of view, it is however only part of the story. Social equity and quality of living are equally as important in maintaining social cohesion and fostering vibrant and productive communities. It is at this junction that innovation, both technical and commercial, is needed more than ever to bring about the desired social and sustainability outcomes.

Current technology can provide technical solutions to many challenges of modern living, including sustainable living. However for it to work, the technology focused approach has to be broadened to include commercial solutions consistent with principles of social inclusion and equity.

Why current green building rating schemes are inadequate

Most green building rating schemes seem to promote buildings as self sufficient islands in an urban landscape. Buildings are rewarded for generating their own power, including power from renewable sources, providing water and waste treatment, composting facilities, worm farms and other similar functions. While appealing to some, this vision often runs into serious problems in the context of high density living.

The common problem is lack of economies of scale to support commercial outcomes. Most of the green building ratings systems include credit points for ecology, transport and waste management but often there is very little individual building owners or developers can do to effectively influence
outcomes in these important considerations. Some would argue this situation results in sometimes
cynical exploitation of rating systems and a tick-box approach to building design and token gestures,
with often limited sustainability outcomes. This is not a sustainable model for high density living.

Rather than self-sufficiency, shared infrastructure should be promoted. Tall buildings with their high
population density create economies of scale that allow for a much greater resource and capital
efficiency. The shared model also demands greater collaboration between developers, financial
markets and local communities in delivering equitable, inclusive and sustainable outcomes.

Combining traditional technology and shared infrastructure
Traditional approaches to building sustainability are obviously still valid. Good passive design is a
cornerstone of any best practice outcome. Tall buildings are no exception, although implementing
some of the principles requires advanced technological and construction strategies. Effective solar
gain control, insulation, air tightness, natural ventilation, water efficiency or renewable energy systems
are more critical on tall buildings. The old concept of activating building fabric as a thermal storage
may also find its application in tall buildings by providing a mechanism for improving thermal comfort,
reducing energy use and assisting in demand management. Vertical temperature gradient
encountered on tall buildings in hot climates, may offer another opportunity to reduce cooling energy
consumption.

What really changes things for tall buildings is the simple fact of increased resource use densities,
which require innovative and integrated supply side technologies and commercial solutions. This shift
in the scale and nature of demand opens opportunities for decoupling supply side sustainability
infrastructure from buildings. Sustainability outcomes become a shared concern of the building owner,
the infrastructure provider and local community which mandates prescribed sustainability outcomes.
An increase in scope and concentration of demand enables innovative technical integration in
providing sustainability infrastructure. Aggregation of infrastructure enabled by high density of
resource use also facilitates greater efficiency in sourcing and deploying capital.

A more commercially viable approach
Tall buildings with their high population density generate the critical mass required to make large scale
sustainability infrastructure commercially viable. Economies of scale are particularly significant when
developing capital intensive infrastructure, including energy, water, transport and waste management.
Such economies of scale may further foster integration of off-, or on-site renewable energy generation
through the development of innovative business models for sharing generation assets at a precinct
level.
A growing urban population, with its obvious challenges, forces us to rethink business models for sustainable tall buildings precincts to dramatically improve efficiency of resource utilisation and to limit the urban sprawl. These new business models will require partnerships between developers, financial markets and local communities to bring about equitable, inclusive and sustainable outcomes.

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