



International
Resource
Panel

THE WEIGHT OF CITIES: RESOURCE REQUIREMENTS OF FUTURE URBANIZATION

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1. CHALLENGES OF THE FUTURE

- ▶ The proportion of the global population living in cities and towns is expected to rise from 54 percent in 2015 to 66 percent by 2050. Most of this transition will take place in the Global South, especially in Asia and Africa, and will require a **significant expansion of existing cities, as well as the construction of new cities.**
- ▶ Business as usual could result in the annual resource requirements of urban areas growing from 40 billion tonnes in 2010 to nearly 90 billion tonnes by 2050. The high demand for such raw materials will far exceed what the planet can sustainably provide. **Resources should now become a central policy concern**, in addition to concerns over CO₂, which are now well recognized.
- ▶ In addition, the long-term historic **sprawl of cities by 2 percent per year** threatens to increase global urban land use from just below 1 million km² to over 2.5 million km² by 2050, **putting agricultural land and food supplies at risk** (see IRP report on *Food Systems and Natural Resources*, 2015).
- ▶ Cities that become more resource-efficient in transport, commercial buildings, and building heating/cooling could achieve **reductions of between 36 to**

54 percent in energy use, GHG emissions, metals, land and water use.

2. RETHINKING URBANIZATION: RECOMMENDATIONS FOR POLICYMAKERS

A transition towards low-carbon, resource-efficient and socially just cities is crucial to advance towards the Sustainability Development Goals and the New Urban Agenda. The concept of **'urban metabolism' (the flow of resources through a city)** can be used to frame thinking about how cities can improve citizens' access to essential services (a focus on well-being for all) while managing their resources wisely and producing minimal waste. This transition could be achieved through the following approaches:

- 1. Urban metabolisms must shift from 'linear' to 'circular':** This implies new ways of managing the movement of resources through the city. Businesses and cities will have to focus on offering high value services rather than selling artefacts; providing heat instead of heaters, mobility instead of highways and cars, light instead of light bulbs. Concepts such as 'urban mining', 'resource cascading' and 'industrial symbiosis' and the various manifestations of the 're-economy' (reduce, reuse, recycle) will define the new urbanism.



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2. Urban metabolisms must be monitored to assist strategic planning at local government level:

Local governments must understand cities' inputs (e.g. biomaterials) and outputs (e.g. waste and emissions), using these to develop resource efficiency strategies.¹ In addition, the relationship between gross domestic product (GDP)² and material flows, global land use and GHG emissions must be measured, and targets must be set. The negative externalities of various resource uses must be priced in to provide economic incentives for behavioural change.

3. City planning 'defaults' must be changed:

Cityscapes need to be designed for people rather than cars, and must allow the poor, in particular, to access the opportunities on offer in the city and prevent uncontrolled sprawl:

- ▶ **Create compact urban growth:** a network of high-density nodes of people, jobs and amenities (approximately 15,000 people per km²) that are connected by efficient and affordable mass transit systems (e.g. light rail, rail, bus rapid transit) and are surrounded by medium-density areas (7,500 to 10,000 people per km²). Transit-oriented development (TOD) and area development should be approached as integrated portfolios.
- ▶ **Human-scale sustainable design** that creates conditions for liveable functionally and socially mixed-use neighbourhoods, with options for soft mobility (e.g. walking, cycling) and 'passive' heating, cooling and lighting at the building level.
- ▶ **Resource-efficient urban components**, such as vehicle sharing, electric vehicles and charging point networks, efficient energy, waste and water systems, smart grids, cycle paths, energy-efficient buildings, new heating, cooling and lighting technology, etc.

- ▶ **Urban infrastructure planning for cross-sector efficiency**, such as using waste heat in district energy systems and waste materials in construction, such as fly-ash bricks.

- ▶ **Promotion of sustainable behaviours**, such as reducing and/or separating waste at source for recycling, using public transport, walking or cycling, enjoying public spaces, etc.

4. A new governance model and politics of new imaginative business propositions and experimentation can provide hope for a better future:

An 'entrepreneurial urban governance' is proposed, which envisages an active and goal-setting role for the State, but in ways that allows broader coalitions of urban 'agents of change' to emerge. This would foster new imaginative business propositions to guide strategic planning for vibrant, green and socially inclusive cities and promote experimentation. It would also connect to global city networks and 'twin town' or 'sister city' initiatives to foster systemic learning between cities. Concepts such as 'living labs', city deals, innovation hubs and special zones indicate that cities are now thinking much more in terms of 'learning by doing'. Experimentation needs to result in a contextually appropriate balance between economic, social, technological and sustainable development.

5. Higher levels of government must support city-level innovation for resource efficiency:

Collaboration with higher levels of government is essential if cities are to overcome regulatory barriers and access funding for innovation. It is crucial that existing infrastructure budgets are channelled in new directions. A low-carbon scenario would require adding only 5 percent to infrastructure spending (Global Commission on the Economy and Climate, 2014).

¹ Resource efficiency strategies use fewer resources to achieve the same level of output or use the same amount of resources to achieve a greater output.

² There is a need to move beyond GDP as the only measurement of progress, and to shift to a system that assesses well-being.



For more information please contact the Secretariat of the International Resource Panel at:
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The full report and Summary for Policymakers can be downloaded at:
<http://www.resourcepanel.org/reports/weight-cities>