



Photo by Jerry Ferguson

Cities and Energy

Cities are energy and carbon intensive. The concentrations of population, industries, transport systems and consumption generate high CO₂ emissions, with over 70% of greenhouse gas (GHG) emissions stemming from cities.

Cities carry the legacy of inherited building stock, often designed and constructed prior to the recognition of climate change. To create the built environment, the construction sector uses energy intensive building materials (such as cement, steel, aluminium, glass and bricks) and methods of building construction.

Cities are vulnerable to both climate change and energy resource scarcity. Building urban resilience requires addressing both problems and other complex and interrelated issues.

City level interventions need to aim at building resilience to face changes in climate and sustained high energy prices. Cities need to consume less energy to reduce emissions. A priority is to reduce the energy consumption of current building stock. This requires a full range of energy saving measures that include:

- Retrofitting buildings to ensure that they are well insulated and do not require heating or cooling.
- Smart metering to reduce household energy consumption.
- Design and development of energy efficient household appliances.

Any new buildings need to be designed and built using energy efficient methods and materials. Through good design and thoughtful construction methods buildings can consume 5% of that of legacy structures. This requires a massive re-education of design and construction professionals and a re-writing of building codes.

Cities and their populations are also the largest consumers of food and food production is highly dependent on oil. 95% of the world's food production is reliant on oil because agriculture is highly mechanised.

This series of city related policy and information briefs draws on lessons learned from cities and infrastructure work carried out by Triple Line over the past five years. It is intended to contribute to more sustainable, inclusive and climate-resilient cities that generate equitable economic growth opportunities for all by identifying market-driven solutions to urbanisation challenges and strengthening democracy and decentralisation processes through capacity building of government agencies at national, regional and city levels.

City economies need to be restructured to make them less reliant on long supply chains. This needs to be tackled on a sector-by-sector basis. Changes to climate and the costs of energy will require a new phase of evolution that will see some sectors survive, new sectors emerge, and others will die if they are unable to adapt to changed conditions.

Urban transport systems will need to be rethought, restructured, and adapted to reduce the use of private transport. Urban transport systems need to be designed to reduce journey lengths and to include non-motorised forms of transport while requiring new competencies in urban design. Old neighbourhoods might need to be restructured to enable people to live, work, have access to social, educational, medical, and other services by walking or cycling within a 15-minute radius. New neighbourhoods need to ensure that residents can survive with low energy inputs and less reliance on long food miles. New systems of urban agriculture need to be developed to enable people to grow their own food on rooftops, on unused or derelict urban land and in their homes using limited space.

Cities produce complex streams of waste that derive from urban lifestyles. Waste tends to be dealt with by committing it to landfills. Waste harms the environment by contaminating water-tables, by leaching harmful chemicals and by occupying valuable urban land. Urban waste could almost entirely be done away with if a waste “economy” is developed and waste products from one process become inputs to another complementary process thus creating a cyclical system where all waste has value and is re-integrated back into production.

Which are the most vulnerable sectors?

Many cities are vulnerable to both the impact of climate and energy scarcity. All countries have a threshold price for energy that their economies can bear. Countries with high levels of dependence on imported energy are most vulnerable. Countries with high levels of debt are also vulnerable and will face balance of payments problems as energy prices rise. Sectors with high energy inputs are particularly vulnerable to increases in energy prices.

Which countries should be prioritised?

Countries that should be targeted are those with high climate and energy vulnerabilities. Economic growth is highly correlated with energy consumption so if these growth rates are sustained, higher energy prices will likely follow and will affect economies.

What challenges do we face?

A focus on cities requires an approach that incorporates both national level and local level actors. Within the OECD there is recognition that a multi-level governance framework is required to link and coordinate policies between national, regional, and local levels.

What should cities do?

- Turn every available rooftop into a vegetable garden or a decentralised solar power plant
- Make sure any wasted urban space is used for urban agriculture
- Ensure that all publicly funded infrastructure is carbon neutral or, better still, carbon negative
- Create stringent building regulations that require all new buildings to be carbon neutral and retrofitting of existing buildings
- Ensure rigid enforcement of these rules through a well-paid and well-trained inspectorate

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