

Background note

Decoupling Energy and Resource Use in the Building and Construction Sector

Preamble

India, at its present development stage is at a crucial juncture where it has to carefully strategize its development pathways while meeting the growing demands of a population of 1.2 billion (Census of India, 2011), growing at an average annual exponential growth rate of 1.64% (ibid). Having signed the Paris Climate Agreement, and determined to achieve the targets it has set for itself in its Intended Nationally Determined Contributions (INDCs), and formed the Indian Resource Panel (InRP) on Resource Efficiency, India realizes that with limited available natural resources there is a need to make significant efforts towards ensuring an environmentally sustainable growth trajectory. This would mean that India has to adopt a low carbon-resource efficient economy, where economic growth is decoupled from environmental degradation.

A popular approach developed for creating a low carbon-resource efficient economy is that of 'Decoupling'.

Decoupling in its formal sense means removing the link between any two variables. The International Resource Panel (IRP) launched by the United Nations Environment Programme distinguishes between two forms of decoupling namely, *resource* and *impact*.

The former discusses reducing the rate of use of (primary) resources per unit of economic activity i.e. efficient use of resources, while the latter illustrates raising economic output while reducing negative environmental impacts that arise from extraction, production, use, and post-use of resources.

In this regard, Development Alternatives Group, India and Wuppertal Institute for Climate, Environment and Energy, Germany have collaborated to establish knowledge on the policy environment and the stakeholders involved in ensuring decoupling in the building and construction sector and to identify the potential alternate material and technology interventions that can reduce the environmental impact and increase the efficiency of the use of resource and energy. As a result of this work, three policy briefs have been developed.

The proposed workshop will address the possibilities of both resource and impact decoupling in this sector and bring together key stakeholders in the private and public sectors to share perspectives and ideas on barriers and opportunities for delinking energy and resource use from economic growth and recommendations for achieving a resource efficient economy.

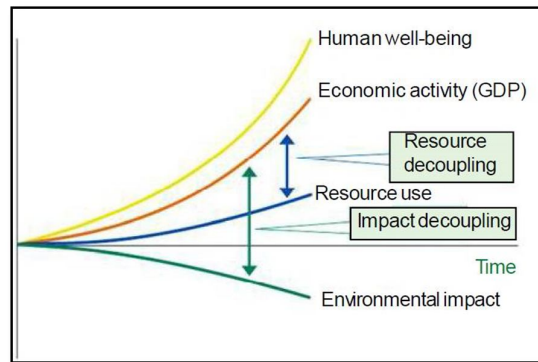


Figure 1: Decoupling Resource Use from Growth Source: UNEP IRP, 2011

Why Decoupling in the Building and Construction sector?

Construction in India is poised to become the world's third largest construction sector by 2018 (Global Construction Perspectives and Oxford Economics, 2013). However, this sector is highly resource and energy intensive thus putting tremendous pressure on the natural resources. Environmental impacts such as land degradation, waste generation and CO₂ emissions from transportation and production are proportional to the volume of extraction and use of resources. For

example, annually the Indian brick sector alone generates 66 million Tonnes of CO₂ and consumes 35 – 40 TCE (Tonnes of coal equivalent) of coal/biomass and 350 million Tonnes of top soil (livemint, 2015).

Buildings impose a burden on the environment by consuming a substantial amount of resources like fossil energy and raw materials. It was the second largest sector with regard to material consumption in 2007, accounting for around 20 % of all material demand, growing by over one billion tonnes from 1997 (SERI, 2012). It also uses 40 – 45 % of India's steel, 85 % of paint production, 65 – 70 % of glass, and significant portions of the output from automotive, mining and excavation equipment industries are used in the construction industry (Planning Commission, 2012). Soil and sand are amongst the most critical resources. This is primarily due to the conflict of use (for e.g. fertile top soil is needed for agriculture) and the large ecological footprint that is left behind in terms of the environmental degradation (i.e. habitat destruction, collapsing river banks, soil erosion, river flooding etc.) arising from excessive extraction of sand and soil.

Further in the specific case point of the building sector, of the total energy consumption in the country in the year 2013 – 2014, the residential sector and commercial sector consumed 22.5% and 8.7% of the total energy respectively (Central Statistics Office, 2015). The energy footprint of buildings includes embodied and operational energies. Embodied energy includes the energy consumed during extraction, production and transport and demolition of materials. The energy consumed during its operational phase accounts for 80 – 90 % of the total energy use by buildings (Ramesh et al., 2013). One needs to note that while access to energy has improved in India, there continues to be lack of planning in building designs that result in inefficient patterns of energy use.

The sector is hence estimated to face massive resource constraints in the future. This translates into an urgent call to decouple our growth in this sector from resource and energy use.

Potential for decoupling of Energy and Resource Use in the Building and Construction Sector

In the Indian scenario numerous policies and popular green building rating systems exist which have been key to minimize the environmental impact and resource consumption caused by the construction and the operation of buildings. They encourage the use of materials with low embodied energy and the reuse of industrial by-products in construction, and the use of energy efficient and renewable energy technologies. However, the ease of adaptability of these alternatives differs depending on various factors, e.g., cost of alternatives, policy support, awareness amongst the stakeholders etc.

Questions the workshop attempts to delve upon

The questions that need to be answered subsequently in relation to decoupling are:

1. What is the right mix for a holistic design approach in the building and construction sector to ensure India's transition towards a low carbon-resource efficient economy in the short and the long term?
2. From the perspective of individual stakeholders, what are the drivers and barriers for decoupling of resource and energy use?
3. What are the recommendations for ensuring decoupling of resource and energy use in the building and construction sector?