

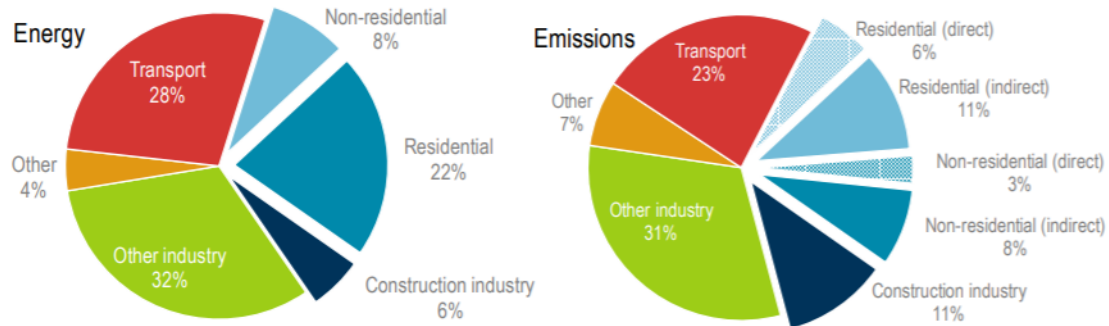
Construction and Climate Change

With time Construction practices have changed drastically where materials and methods have evolved into what has turned out to be extremely harmful for the environment. Cities and towns are growing leading to an ever-expanding Construction Sector not only in terms of buildings like houses, schools, hospitals etc. but roads and highways too. There are various interconnected impacts that the construction sector has on the environment. To list a few, deforestation, air pollution, water pollution, landfill waste, heavy energy consumption, high carbon emission and many underlying factors related to activities like manufacturing of materials, transportation etc. To put into perspective these irreversible impacts with numbers,

According to a recent study by Bimhow, the construction sector is responsible for 23% air pollution, 40% of drinking water pollution, 50% climate change and 50% landfill waste. Another research by US Green Building Council (USGBG) pointed out that construction sector is responsible for about 40% of the world's energy use. The council estimated that the emissions from buildings (commercial) will increase by 1.8% by the year 2030.

How significant a part Construction is of these interconnected phases contributing to climate change often goes unnoticed. To put into rough viewpoint, I have tried to state a rather generic timeline accompanied by statistics for a better understanding and to emphasize on the scale of damage.

Figure 2 • Global share of buildings and construction final energy and emissions, 2018



IEA (2019). All rights reserved.

Notes: *Construction industry* is the portion (estimated) of overall industry devoted to manufacturing building construction materials such as steel, cement and glass. Indirect emissions are emissions from power generation for electricity and commercial heat.

Sources: Adapted from IEA (2019a), *World Energy Statistics and Balances* (database), www.iea.org/statistics and IEA (2019b), *Energy Technology Perspectives*, buildings model, www.iea.org/buildings.

Key message • The buildings and construction sector should be a primary target for GHG emissions mitigation efforts, as it accounted for 36% of final energy use and 39% of energy- and process-related emissions in 2018.

Cities and towns are growing constantly which clearly involves more deforestation every day. Around 2.47 million trees are cut down every day globally which equates to about 900 million trees annually (for a lot more than just clearing land for construction). This cleared land for cities is leading to an ever-growing construction sector which uses almost 400 million tons of construction material very year, most with harmful bearings on the environment. The extraction or manufacturing of these materials requires massive amounts of energy consumption. According to the *2019 Global Status Report for Buildings and Construction*, “The buildings and construction sector accounted for 36% of final energy use and 39% of energy and process-related carbon dioxide (CO₂) emissions in 2018, 11% of which resulted from manufacturing building materials and products such as steel, cement and glass.”

Apart from the energy consumption, these materials (like steel, cement and glass) also make the buildings in simplest of words 'climate unfriendly' which leads to inevitable installations of Air conditioners or heaters which only adds to carbon emissions, all of which could have been avoided by choosing better alternatives of not only materials but designs too. There have been slight improvements in reducing the heating and cooling demands in our buildings, but about 30% of the greenhouse gases are just the embodied energy and greenhouse gases in the material that we build with. Michael Green talks about why wood is the only buildable resource that will actually contain the carbon that would otherwise go back into the environment, solving, according to him the two main aspects of climate change, lowering emissions and storing carbon unlike materials like steel and concrete which contribute to 5-8% and 4% of global carbon emissions respectively. After transportation and energy, cement production is the third biggest source of carbon dioxide emissions and the Construction industry has a big hand in them all.

Apart from cement, water is another core ingredient used throughout the construction process. So not only does construction use excessive water but it also leads to water pollution. The Construction Industry causes more water pollution than any other industry. It is estimated that 10-30% of wastes disposed off in landfills originates from construction and demolition activities. Silt and soil that runs into natural waterways turns them turbid which restricts sunlight filtration and destroys aquatic life. In Asia alone, this happens in 54% lakes. In 2010, approximately 8 million metric tons of plastic waste went into the ocean, most of which came from landfills and construction sites. Even the maintenance or renovation processes generate great quantities of waste.

Atmospheric and land pollution is also contributed to when asphalt, bricks, wood, glass, concrete, metals etc. are wasted and then disposed off in incinerators and landfills. The transportation used in the process also has a negative impact of construction on environment.

The list of negative impacts goes on and on. According to the 2019 Global Status Report for Buildings and Construction, “Although most countries (that is 136 out of 184) mention buildings in their NDCs, few detail explicit actions to address emissions within the buildings sector.” The construction related sector is not getting the kind of attention it needs from policy makers and people in power. Not only is there limited progress in new policies but preexisting policies aren’t implemented with the efficiency that the environment desperately requires now. The report also states,

By 2020, countries are requested to communicate their new or updated nationally determined contributions (NDCs) setting out their efforts to reduce national emissions and adapt to the impacts of climate change. 2020 is therefore a key year for countries to enhance their NDCs and commit to more aspirational targets”

NDCs is an international process in which countries announce their national-level commitments to reduce emissions.

I think there is only so much we can do about the bigger picture when people in power are ignorant. In context of policies and laws, I think scientists and other experts need to be given more say in the decisions making process. But on comparatively smaller scales, there too is a lot that can be done. Most places have local historical architectural practices which incorporated designs keeping in mind the local materials and weather which is the epitome of sustainable buildings and needs to be investigated in more depth. Hemp, natural lumber, clay plaster, straw bales etc. are a few more examples of comparatively sustainable substitutes. Keeping aside natural substitutes, recycled materials, specially recycled plastic can be used to make roads and bricks. Using recycled aggregates including recycled concrete from old demolished buildings is a possible substitute for cement. There is so much potential in the construction sector. Multiple solutions already exist, only the implementation on large scales is absent.