

# Environmental Impacts of Construction Projects

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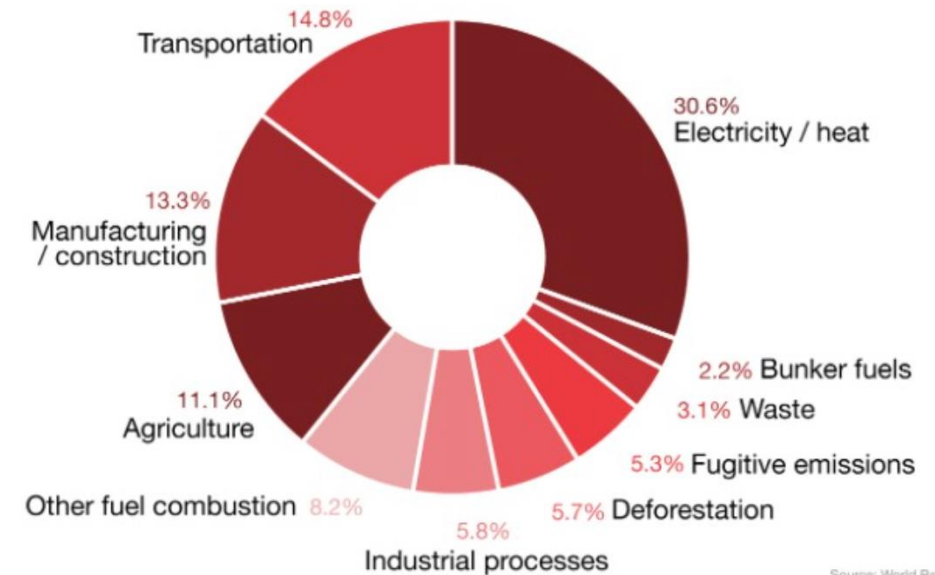
Construction projects around the world are responsible for about 50 % of human contribution to pollution, global warming and ozone layer depletion.

# Due to the use of:

- ▶ Large amounts of Energy Use
- ▶ Transportation of Materials
- ▶ Land Use- excavations, and deforestation
- ▶ Waste and Use of non-recyclable Materials & resources SUCH AS:
  - ▶ Glass (Windowpane glass )
  - ▶ Aluminum
  - ▶ Fossil fuels such as (Coal, Petroleum, Natural gas)
- ▶ Hazardous Substances & Greenhouse Gases, SUCH AS:
  - ▶ Methane
  - ▶ Carbon dioxide
  - ▶ nitrous oxide

## What's causing climate change?

Global greenhouse gas emissions by sector



Source: World Resources Institute

**Figure 1: Some interrelationships between the built environment and environmental issues**

ISSUE	Energy use, global warming and climate change	Resources, waste and recycling	Pollution and Hazardous substances	Internal environment
Planning, land-use and conservation	<ul style="list-style-type: none"> <li>• Transport implications</li> <li>• Sea level rise</li> <li>• Overheating</li> <li>• Increased UHI effect</li> <li>• Passive heating/cooling</li> <li>• Thermal standards for refurbished buildings</li> <li>• Urban form and configuration</li> <li>• Flooding</li> <li>• Biodiversity</li> <li>• Water quality</li> </ul>	<ul style="list-style-type: none"> <li>• Minerals extraction</li> <li>• Disposal of spoil</li> <li>• Recycling derelict land</li> <li>• Re-use of existing buildings</li> <li>• Resources used for major infrastructure projects</li> </ul>	<ul style="list-style-type: none"> <li>• Pollution effect of built environment</li> <li>• Waste disposal</li> <li>• Maintenance of environmental quality objectives</li> <li>• Ecosystem conservation</li> <li>• Biodiversity conservation</li> <li>• Contaminated land register</li> <li>• Estate maintenance</li> <li>• Pesticides etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Orientation daylight and passive heating</li> <li>• Rn-222</li> <li>• Electromagnetic radiation</li> </ul>
Internal environment	<ul style="list-style-type: none"> <li>• Energy use, heating, appliances etc.</li> <li>• Flooding</li> <li>• Thermal efficiency</li> <li>• Reduced ventilation rates/less occupant control</li> </ul>	<ul style="list-style-type: none"> <li>• Gas from recycled sites</li> <li>• Reduced off-gassing from recycled products</li> </ul>	<ul style="list-style-type: none"> <li>• Indoor pollution/ Off-gassing from materials</li> <li>• Effect on pollution levels of reduced ventilation rates</li> <li>• Smoking</li> <li>• Noise from external and Internal environment</li> <li>• External air quality</li> <li>• Rn-222 and landfill gases</li> </ul>	
Pollution and hazardous substances	<ul style="list-style-type: none"> <li>• Energy related greenhouse gases</li> <li>• Other greenhouse gases</li> <li>• Ozone depletion</li> <li>• Ozone creation</li> <li>• Acidification</li> <li>• Ecotoxicity</li> <li>• Wastes and pollution from power generation</li> </ul>	<ul style="list-style-type: none"> <li>• Pollution during manufacture</li> <li>• Waste production</li> <li>• Pollution of primary resource</li> <li>• Recycling contaminated land</li> </ul>		
Resources, waste and recycling	<ul style="list-style-type: none"> <li>• Energy in transport</li> <li>• Energy in recycling</li> <li>• Use of sustainable resources (e.g. timber)</li> </ul>			

# Solutions:

In order to avoid some of these issues and reduce the environmental impact of building construction, these regulations have been created by the building department.

- 1) LEED
- 2) Zoning Regulations
- 3) Environmental Friendly Building Adaptations

# LEED (Leadership on Energy and Environmental Design )

Is a green building system that helps to reduce pollution, the demand for potable water, waste & demand for virgin material minimize the environmental impact of new buildings by addressing 7 major areas of development .

Sustainable sites - reduces the pollution associated with construction activity by encouraging alternative modes of transportation to reduce the impact of automobile use.

Water efficiency- promotes reducing the demand for potable water and generation of waste water by using water conserving fixtures.

Energy and Atmosphere- reduces the environmental and economic impacts associated with fossil fuels energy use and minimizing the emission that contribute to ozone layer depletion and global warming.

Material and Resources - seeks to maximize the use of locally available, rapidly renewable and recycled materials.

Indoor Environmental Quality- focus on the comfort, productivity and well being of building occupants by improving indoor air quality.

Innovation in Design- rewards exceeding the requirements set by LEED

Regional Priority - provides incentives for practices that address geographically specific environmental priorities.

# Zoning Regulation:

- ▶ Around 1901 buildings were getting so tall that they would block the emission of sun light in some areas and blocking the view provided in other buildings which is why setbacks, rules to protect public health and welfare were established with the zoning resolution of 1916 and 1961 along with the division of NYC into residential, commercial and manufacturing areas.





## Environmental Friendly Building Innovations:

- ▶ Green roof
- ▶ Small gardens
- ▶ Green walls
- ▶ And many otherS



# References

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