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Caring for Mother Earth

Sustainability with NetZero Buildings

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For the most part of the human history, we used stone wall dwellings, mud adobe huts, wooden houses, and thatched roofs, made up of mostly natural materials that required very little processing. Only in the last one century or so, we started using highly processed materials, specifically cement, steel, and glass.

Unfortunately, these materials require significant energy to produce. In addition, we are increasingly using heating, ventilation, and air conditioning (HVAC) systems to maintain comfortable room temperature regardless of the conditions outside. These systems and various household appliances, such as refrigerators, washer-dryers, ovens, and dishwashers, require even more energy!

So, the energy required to construct and operate modern buildings is adding significant amounts of carbon-based greenhouse gases, into the atmosphere causing global warming and climate change.

We ought to do something to about it.

We need to care for Mother Earth for the brighter future of humans and all other living organisms. Since buildings consume 40% of total energy production worldwide, NetZero buildings go a long way providing a solution.

Overview

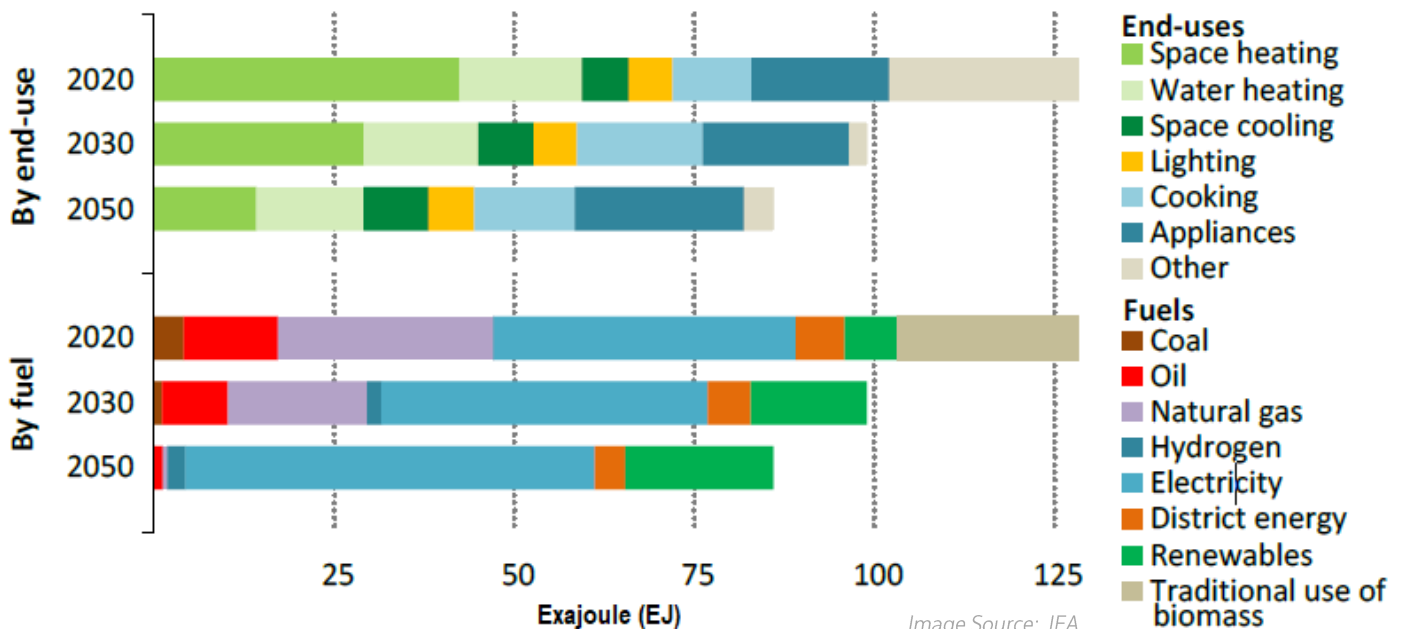
A NetZero building is an energy efficient building that fully balances its energy consumption and the renewable energy it produces on-site so that the net external energy demand of the building over a period of time (e.g., one year) is zero.

Buildings consume 40% of total energy production (22% by residential buildings and 18% by commercial buildings), most of which is produced using fossil and biomass fuel that increases carbon and greenhouse gases in the atmosphere. So, NetZero buildings will have a huge impact on reducing global warming.

The goals of International Energy Agency (IEA) are:

- By 2030, all new buildings will be NetZero buildings.
- By 2040, half of existing buildings will be retrofitted to be NetZero.
- By 2050, Over 85% of all buildings will be NetZero or even better to reach overall net zero energy consumption by buildings.

With the movement towards NetZero buildings, according to IEA, the global energy consumption in buildings is expected to change as per the chart below.



According to IMARC Group, the global NetZero buildings market size reached US\$ 27.8 Billion in 2022 and it is expected to reach US\$ 103.9 Billion by 2028, at a CAGR of 21.8%.

India Story

India has a lot gain from NetZero buildings. Among the top 15 most-polluted cities in the world in 2022, 10 cities were Indian cities according to [IQAir](#). Since India is rapidly growing economically, building infrastructure has become a key priority adding to the country's long-term energy needs and resulting pollution.

The Indian Bureau of Energy Efficiency has developed [Energy Conservation Building Code](#) (ECBC) for commercial buildings. The ECBC is expected to prevent 1,065 tons of CO₂ emission by 2030. Compared to conventional buildings,

- ECBC compliant buildings have 25% savings,
- ECBC+ compliant buildings have 35% savings, and
- Super ECBC compliant buildings have 50% or more savings.

In addition, [Indian Green Building Council](#) (IGBC) launched the 'IGBC Net Zero Energy Buildings Rating System' in 2018 for new constructions, as well as existing buildings.

[Indira Paryavaran Bhavan](#)



The office of the Ministry of Environment and Forest in New Delhi is considered to be India's first modern NetZero Building. It uses 70% less energy and includes various sustainable features/technologies, such as solar panels, unique landscape, rainwater harvesting, and energy-efficient lighting.

[The Infosys Experience](#)



Image Source: Infosys

India's leading global IT services company, Infosys, has pioneered NetZero buildings on its campuses. For new buildings, the designs are maximizing natural light, minimizing heat gain, and using renewable sources for building's power requirements. Additionally, it is retrofitting its existing buildings. It has received the highest level of certifications from IGBC, LEED and GRIHA. Despite an increase in the headcount from 2008 to 2020 by 166%, its electricity consumption increased by only 20%.

Enabling Technologies

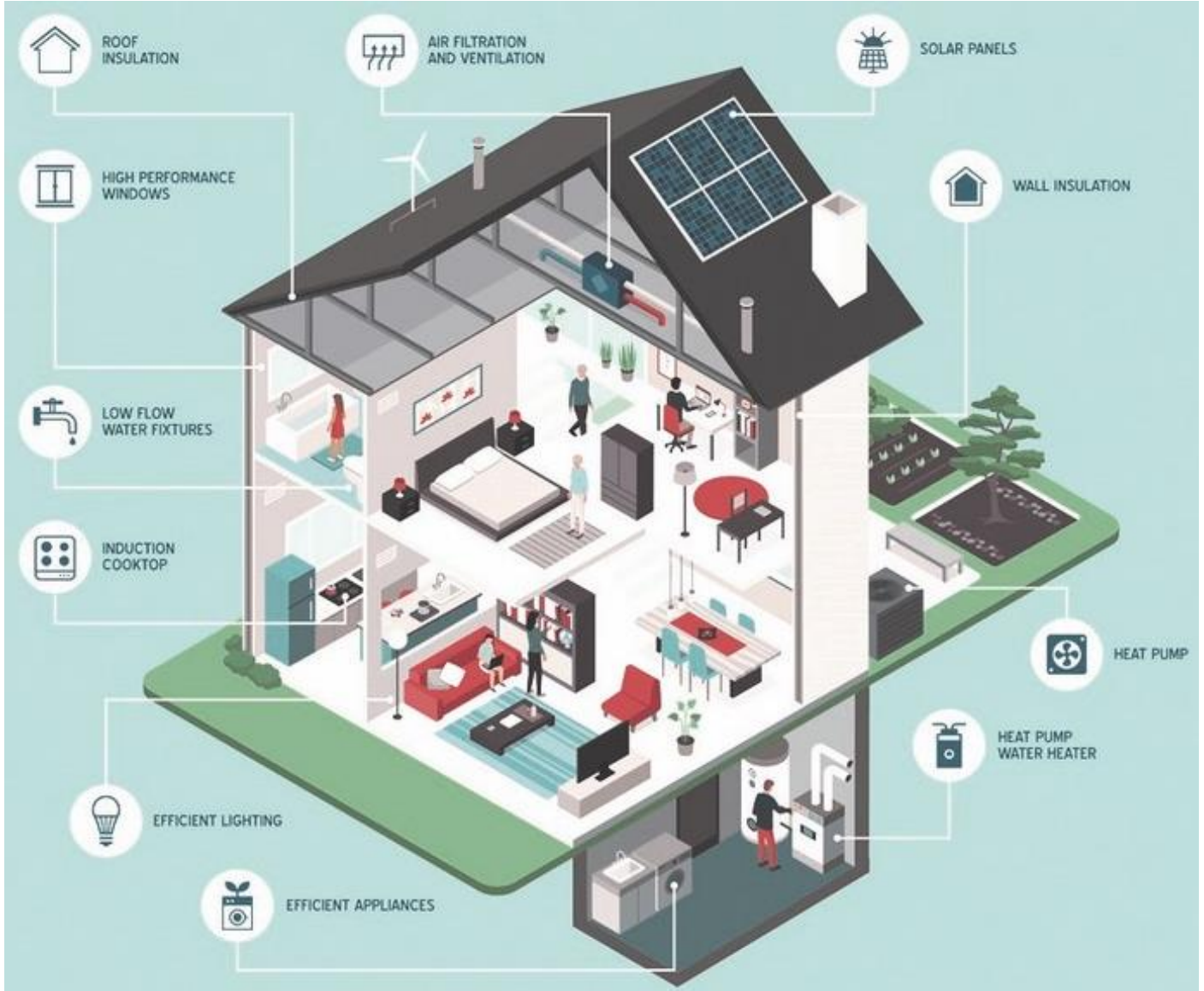


Image Source: Rethinking The Future

NetZero buildings require many technologies to achieve the balance between the energy supply and the energy use. These technologies are broadly grouped into two types: Technologies for both local generation of renewable energy; and technologies for efficient use of energy.

Local Generation of Renewable Energy

- *Solar Photovoltaic Panels:* Photovoltaic (PV) solar panels are placed on rooftops or other appropriate surfaces to harness solar energy and generate electricity.
- *Geothermal Heat Pumps:* Ground-source heat pumps can exploit the underground and atmospheric temperature differences to heat and cool the building.
- *Wind Turbines:* Rooftop small wind turbines can generate electricity in high-wind locations, such as hilltops and seashores.

Efficient Use of Energy

- *Energy-Efficient Lighting:* Energy-efficient LED-based lighting systems.
- *High Performance Windows and Doors:* Reducing heat loss and gain while allowing sunlight to enter the building, and providing cross ventilation for efficient air circulation.
- *Advanced Insulation and Glazing:* Minimizing heat transfer across the building walls.
- *Rainwater Harvesting:* Collecting, storing, and using rainwater.
- *Green Roof Technology:* A roofing system that incorporates vegetation and a growing substrate on the rooftop for natural insulation.
- *Glue Laminated Timber:* Replacing concrete and steel, thereby reducing the overall weight of the structure and enhancing resilience in the event of natural disasters.
- *Intelligent Building Systems:* Building Energy Management Systems (BEMS) oversee HVAC, lighting, occupancy-detection sensors, and real-time monitoring of and adjusting the energy usage.
- *Grid Connectivity:* Net metering allows surplus energy produced to be supplied back to the grid providing energy credits.

Who Would be Interested?

NetZero buildings not only reduce the carbon footprint and contribute to reducing climate change, they also significantly reduce energy costs of operating buildings.

Construction Industry

- Residential housing
- Office spaces
- Industrial complexes
- Hotels
- Private hospitals

Building Material Providers

- Green cement and alternate cements
- Eco-friendly paints
- Energy efficient, reflective glass
- Solar electric panels
- Solar water heaters

Retail Sector

- Shopping malls
- Retail store complexes

Logistics Sector

- Warehouses
- Transport depots
- Railway stations
- Airports and SeaPorts

Manufacturing Plants

- Factories
- Material and finished goods storage spaces
- Administrative buildings

Local Governments

- Government buildings
- Hospitals
- Industrial parks
- Convention centers
- Educational institutes
- Smart cities



Key Considerations

The Paris Climate Agreement, a legally binding international treaty on climate change, was adopted by 196 countries at the UN Climate Change Conference (COP21) in Paris, France, on 12 Dec 2015. It entered into force on 4 November 2016 and set the targets of 45% reduction in global emissions by 2030 and complete net zero emissions by 2050.

Further building on the foundations of COP21, the 26th Conference of the Parties (COP26) of the United Nations Framework Convention held in Glasgow aimed to limit the global temperature rise to 1.5 degrees Celsius.

Recently, COP28 was held in Dubai, where UAE Consensus was adopted. It became the first COP conference in which the phasing out of fossil fuels was explicitly mentioned.

Therefore, all industries must move towards incorporating energy efficiency in one way or another. All these international treaties are now driving countries to develop and modify their environmental laws and regulations facilitating NetZero buildings.

Legal and Regulatory Aspects

- They pertain to the stringent compliance required with building codes and regulations governing energy efficiency and emissions reduction.
- Special permits and zoning considerations might be required for installations of certain net zero technologies.

Energy Performance Certifications (EPCs)

- Additional standards and certifications like [Leadership in Energy and Environmental Design \(LEED\)](#) by the US Green Building Council and [Certifications](#) by Passive House Institute are also proposed for the designs, building material and operational efficiencies of NetZero buildings.
- Many regions also require minimum EPC ratings to qualify for certain incentive schemes.

Financing and Incentives

- Governments play a pivotal role in promoting NetZero transition. They, in partnerships with private sector entities and non-governmental organizations, can incentivize the growth of net zero technologies and projects through financing options and incentives, such as:



- Subsidies and post-purchase rebates for purchasing equipment,
- Grants for research and development,
- Bridge loans and credit guarantees,
- Low-interest, sustainability-linked loans,
- Green bonds and blended finance
- Extension of tax offsets, and
- Tax credits.

Ethical Considerations

- They revolve around transparency, necessitating the provision of comprehensive information about a building's carbon footprint and ensuring that Net Zero Buildings maintain long-term sustainability with respect to environmental performance, adapting to evolving technologies, stands as an ethical obligation in honoring environmental commitments.
- We are seeing the increasing number of accusations of lip service and “greenwashing.” Some examples include:
 - Misleading labeling of products
 - Vague or exaggerated claims
 - Deceitful advertising
 - Incomplete information or half-truth.
 - Incorrect association through imagery or symbols
 - False certifications
 - Token efforts just for the show

Generation Gap in Acceptance

- A survey by McKinsey & Co found that younger people are more willing to pay more for environmentally friendly products.

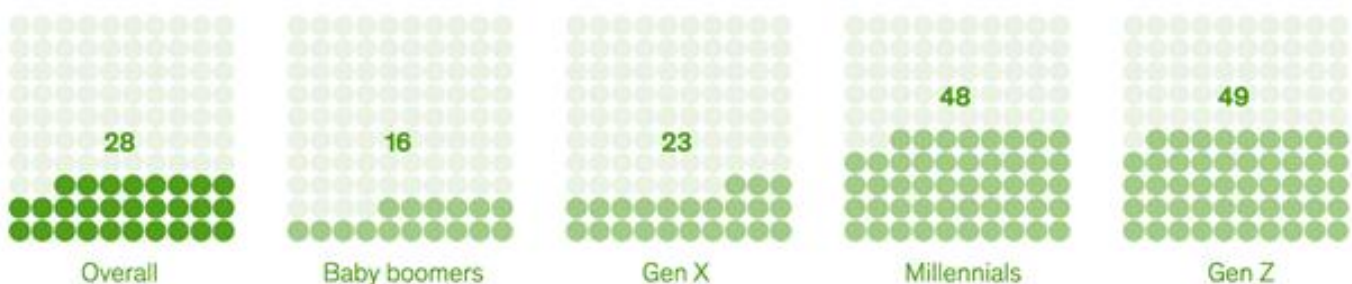


Image Source: McKinsey & Co

Key Considerations for India

There is no statutory requirement for setting up NetZero Buildings, though active efforts are made to promote them.

- The Ministry of Housing and Urban Affairs is working on making net zero waste mandatory for upcoming housing societies and commercial complexes.
- Presently, most of the efforts for reducing the environmental impact of buildings are being spearheaded by the Indian Ministry of Power, which focuses on energy efficiency. There are limited efforts towards sustainable use of water and other resources.

Shunya Labelling Programme

- The Shunya scheme was introduced in 2021 to promote NetZero buildings. The BEE awards a “Shunya” label to NetZero buildings, and a “Shunya+” label to Net Positive Energy Buildings, which produce more energy than it requires and supplies the excess electricity to the grid.
- The *Shunya* and *Shunya+* Labels have a validity of three years, after which they may be renewed.

Commercial Buildings

- The Indian Bureau of Energy Efficiency (BEE) has most recently launched the Energy Conservation Building Code 2017 (“ECBC”) to promote energy efficiency in the commercial building sector. It recognizes three levels of energy performance standards i.e., ECBC (25% savings), ECBC Plus (35% savings), Super ECBC (50+% savings), based on power savings compared to conventional buildings.
- To aid the enforcement of the ECBC, in February 2018, the Ministry of Power released the Energy Conservation Building Code Rules, 2018 (“ECBC Rules”) under the ECA.

Residential Buildings

- The ‘Eco-Niwas Samhita’ was developed as a code that focuses on improving energy efficiency of residential buildings. Part I focuses on the Building Envelope, and Part II focuses on Electro-Mechanical and Renewable Energy Systems.
- The BEE has introduced the ‘Energy Efficiency Label for Residential Buildings’ with the objective of promoting energy efficiency in residential buildings and facilitating the implementation of the Eco-Niwas Samhita.

Sources and Further Reading

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About US

We are an India-centric, research-based global law firm (www.nishithdesai.com) with five offices in India (Mumbai, Bangalore, New Delhi, Mumbai BKC, and GIFT City) and with license to practice Indian law from our international offices in Silicon Valley, New York, Singapore, Munich, and Amsterdam. Over 70% of our clients are foreign multinationals and institutional investors and over 84.5% are repeat clients.

We are a firm of specialists and the go-to firm for companies that want to conduct business in India, navigate its complex business regulations, and grow. We are known for handling complex, high-value transactions and cross-border dispute resolution (see [Annexure A](#)). And that prestige extends to our engagement with and mentoring the start-up community that bring about industry-changing innovations.

Dedicated to shaping the future of law & society, we have set up a first-of-its kind IOT-driven Blue Sky Thinking & Research Campus named *Imaginarium AliGunjan* (see [Annexure B](#)) near Mumbai. Our ability to anticipate and address challenges from a strategic, legal and tax perspective in an integrated way (see [Annexure C](#)) have won recognitions globally from not just our clients but also government ministries.

For any help or assistance, please contact

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