

Real Estate to go

*From the Covid-19 pandemic
to zero-carbon-ready buildings*



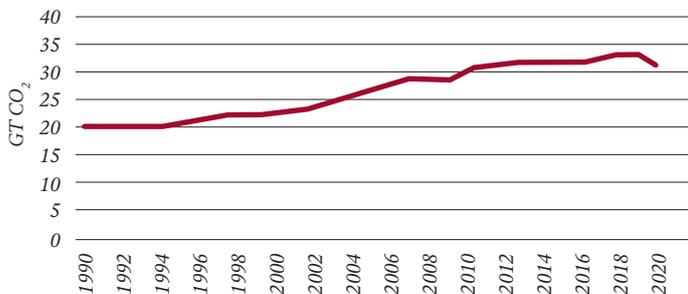
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From Covid-19 in 2020 to net zero emissions (NZE) by 2050

In 2020, global energy-related CO₂ emissions dropped by 5.8%, the largest fall since World War II: such a decline of 2,000 million tonnes is equivalent to the European Union's total emissions. The IEA released the study "Net Zero by 2050: a Roadmap for the Global Energy Sector", which is a flagship research report on energy data modelling to reach Net Zero Emissions (NZE) by 2050. Such a report is a pillar for research on all asset classes including real estate.

Global energy-related CO₂ emissions (Gt CO₂)

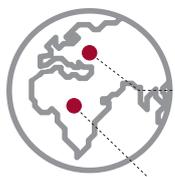


Source: IEA

Zero-carbon-ready buildings

To achieve net zero emissions, 85% of all buildings need to comply with zero-carbon-ready building energy codes by 2050. This can be achieved via 1) the energy use related to a building, 2) the energy supply to the building, 3) the building itself as a source of energy through power systems and 4) the material used in buildings. By 2030, mandatory zero-carbon-ready building energy codes are set to be introduced worldwide. On the existing stock, all retrofits are set to be implemented by 2050. Given differences in building lifetimes – they are shorter in emerging economies compared to more mature economies – the rate of retrofit will then differ across economies: 2% in mature economies versus 2.5% in emerging economies.

Retrofitting per year in countries up to 2030



10 million
apartments in developed markets

20 million
apartments in emerging markets

Source: IEA

The climate-friendly evolution of stock

Globally, floor area in the buildings sector is set to rise by 75% between 2020 and 2050, of which 80% is in emerging markets and developed economies. This is equivalent to the floor area of a city like Paris would be added to the existing stock, but without its Haussmann style! However, existing stock can be retrofitted to reach the net zero emissions target. By 2030, roughly half of the existing building stock in advanced economies will be retrofitted.

Annual additional floor area



Source: IEA

Two key drivers towards decarbonation

Energy efficiency and electrification are the two main decarbonation drivers for the building sector. New technologies across the value chain are key to enabling such a transformation: building design, building material & envelopes, heat pumps, energy efficiency as well as digitalisation and smart controls. The smart building and smart city approaches have paved the way to demonstrate how IoT and data analytics are key to decarbonising through the electricity supply. The shift to zero-carbon ready techs will decrease the share of fossil fuel energy demand from 30% in 2030 to 2% by 2050. Not surprisingly and despite all efforts, differences will remain in regions with strong heating needs. The good news? The use of energy codes is on a rising trend.

Energy codes for the construction industry



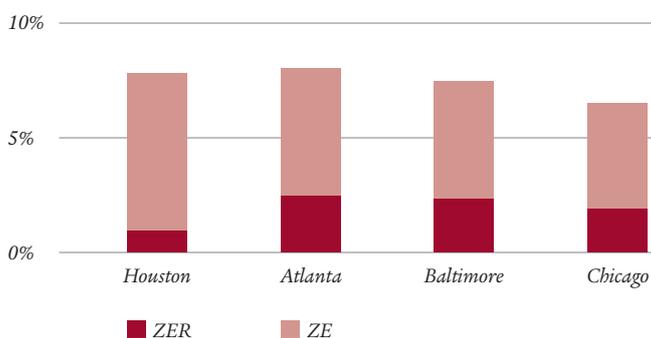
75
countries use energy codes,
of which 40 make these energy codes mandatory for both
residential and commercial properties.

Source: IEA

Zero homes: US example

Zero-energy (ZE) homes produce as much renewable energy as they consume annually while zero-energy ready (ZER) homes have similar levels of efficiency without onsite solar photovoltaics. In the US, ZE single homes and ZER single homes are rapidly increasing: 43% of new homes use air source heat pumps for heating and cooling compared to 10% in 2015. Luckily, a study by RMI suggests that the incremental costs to build a ZE or ZER home are relatively modest: between 6.7% to 8.1% for ZE homes and between 0.9% to 2.5% for ZER homes.

Additional costs for ZE and ZER buildings using the example of the US

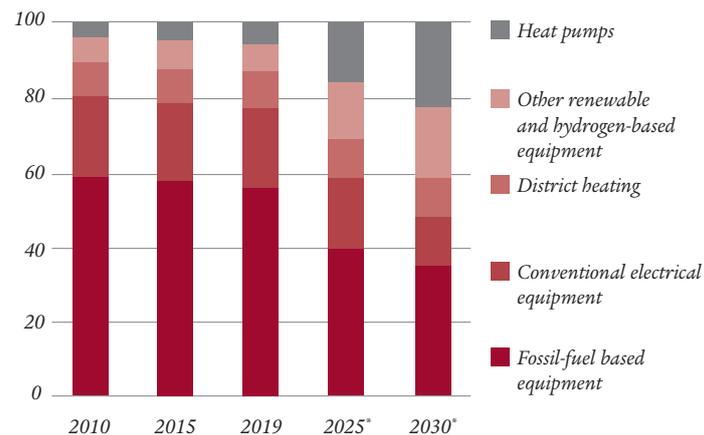


Source: RMI

Hot and cold

Heat pumps are a common technology in new buildings and help to reduce carbon emissions. Worldwide, heat pump installations per month should increase from 1.5 million today to around 5 million by 2030 and 10 million by 2050. Thus, residential heating by natural gas should decrease to 0.5% in 2050 from 30% in 2020. In the meantime, electricity for heating should rise to 55% in 2050 from 20% in 2020.

Heat pumps purchased by households (%) for heating and hot water



Sources: IEA

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