

# What's the Secret to the UAE's Net Zero Buildings?

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The architects behind Masdar City in the UAE are seeking to create a blueprint for the city of the future. A key element of that plan is their work on net-zero buildings, three of which are currently under construction and one of which is set to open its doors later this year. But what is the secret to these visionary edifices of tomorrow?

In short, the UAE's net-zero building philosophy revolves around a holistic approach to the topic, in which the design of the structure, the materials which go into its construction and the fuel which powers it are all carefully selected with the environment in mind. In this manner, the Emirati government hope to curb both energy consumption and the emissions produced therein, as well as providing inspiration for other cities to follow.

## A design for life

Every aspect of the net-zero buildings' design has been painstakingly considered to ensure it works in harmony with its surroundings as best as possible. Of course, creating a comfortable environment in a desert climate is a difficult challenge, but the use of solid walls to insulate it against thermal conditions in lieu of glass, as well as creating airtight envelopes around the edifice to prevent cool air leakage, has helped in that respect.

Meanwhile, the orientation of the building can be optimised to ensure it receives as little direct sunlight as possible, while window ratios and shading features can also help to reduce overheating. Cumulatively, this can bring down the amount of energy needed to power and air condition the space, while the energy which is used is leveraged from renewable sources (such as solar) to minimise emissions as much as possible.

At the same time, those behind the buildings haven't neglected the construction phase, either. By favouring resources such as low-carbon cement, insulation and finishing materials, alongside recycled steel and aluminium, they can ensure that the carbon footprint of the actual building itself remains low.

## The magic number

The first of Masdar City's net-zero buildings – an office space named NZ1 – is currently in the process of receiving LEED accreditation and, if all goes to plan, will open its doors later this year. It will be closely followed by Masdar City Square's HQ building in 2024 and The Link's Co-Lab building in 2025, both of which will also be LEED certified and aim to boast impressive green credentials.

For example, the HQ edifice is mooted to reduce energy consumption by 102% compared to international baselines, with its canopy of more than one thousand solar panels generating 9% more energy than it needs. This will, of course, be fed back into the national grid. Similarly, the Co-Lab will slash consumption by 117% and should contribute some 233,969kWh of renewable energy to the national grid upon opening in 2025.

Of course, this trio of net-zero buildings are just the beginning. Masdar City has already brought down its consumption of both water and electricity by 40% through the deployment of smart technology and more net-zero buildings are anticipated to help the effort going forwards. Once the first phase of the City is finally completed, it will be home to around 16,000 people, the energy needs of whom will be met entirely by a 10MW solar farm that has been running since 2009 and is one of the largest of its kind in the region.