

# Finding energy-efficient properties

A property with greater operational flexibility can be more energy efficient than one with more efficient equipment but limited controls

By Sougata Nandi  
**Special to PW**

Energy efficiency is an outcome of a combination of two things: how well a property has been designed to meet low energy consumption requirements and efficient operation and maintenance. One without the other will invariably result in relatively higher energy consumption and greater carbon footprint. Before moving into a property, it is possible to check for both components to avoid being saddled with an inefficient property and having to

live with high energy costs in perpetuity.

Depending on whether the proposed property is a villa, an office or an apartment in a tower, specific features can be checked with relative ease. Of course, all energy efficiency specifications may not be verifiable without checking specifications sheets of the building material and heating, ventilating and air conditioning (HVAC) equipment.

Abu Dhabi's Estidama and Dubai Municipality's green building code ensure new buildings are compliant with energy efficiency

requirements. However, a large proportion of buildings were constructed prior to these regulations and thus they present a challenge to regulators.

## Smart use of glass

The relative proportion of glass (or glazing) to the overall façade is the first sign of a building's efficient design, particularly that on the south and west façades, from where the biggest heat gain happens. If a building's south and west façades have a relatively small proportion of glazing, less than 10-20 per cent of the total façade area,

✦ An aerial view of Dubai Marina, one of the city's popular neighbourhoods. A tenant must consider a building's energy efficiency before moving in



Pictures: Shutterstock, supplied and GN Archives

the building can be considered relatively energy efficient compared with equivalent buildings.

Simultaneously, the glazing on the north and east façades could be relatively higher to allow daylight utilisation without sunlight loading the HVAC system.

On the same subject, if the windows are recessed within the façade, then more daylight will be allowed in the building, which reduces lighting requirement, and sunlight will be blocked, reducing heat load on the HVAC system.

Al Bahar Twin Towers in Abu Dhabi has an external responsive façade shading the building, except in the north direction. This responsive façade opens and closes depending on the orientation of the sun, effectively blocking direct sunlight from entering the building through the glazing.

By dynamically changing through the day, the responsive façade allows daylight usage and reduces heat load on the HVAC system, leading to a significantly lower energy consumption compared with similar buildings.

When the landscape around a building, particularly for villas, largely comprises trees with significant foliage, such as gulmoohar, frangipani and ghaf, this essentially blocks direct exposure of the building façade to sunlight.

Additionally, landscape also reduces the heat island effect, unlike hardscape surfaces that tend to absorb and retain heat from the day's exposure to sunlight, ensuring significant heat load on

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the building at night as well, thereby leading to higher energy consumption.

## Green roof

If the property is on the top floor of the building, it may be worthwhile to check the roof. Ideally a green roof is the best energy efficient feature that reduces heat load on the property significantly. Unfortunately, green roofs are few and far between and chances are roofs are covered with stones. Stones tend to absorb and retain heat from sunlight through the day, not allowing the building to cool off after sunset, leading to higher energy costs. With Dewa's Shams solar photovoltaic programme gaining momentum, it is expected that more properties may have integrated solar panels as part of the building architecture. This will enable properties to have reduced conventional energy costs by shifting part of the electricity supply to free solar.

For standalone properties with their own HVAC systems, it will be worthwhile to inspect the equipment specifications as well as their physical condition and age. Since January 2012, room air conditioners (RACs) must have an

The higher the star label, the more efficient the system is. In the absence of the Esma star label, the Seasonal Energy Efficiency Ratio needs to be 13 or more for split ACs and single packaged ACs to be qualified as energy efficient. The condensing units of HVAC equipment in villas are usually located on the roof.

Physical inspection will reveal if the condensing fins are covered by sand or dirt, which causes the equipment to consume higher energy. This is also a sign that maintenance is not being carried out timely or effectively. However, this issue can be readily resolved with a systematic maintenance regime.

Keeping the condensing fins clean throughout the year is the easiest and most effective energy efficiency measure a property owner can adopt to reduce energy consumption. Such inspections may not be possible for properties located in towers.

## Operational efficiency

A property may be designed for energy-efficient functioning and may also have the most energy-efficient equipment installed,

but this does not necessarily ensure that the property will operate efficiently.

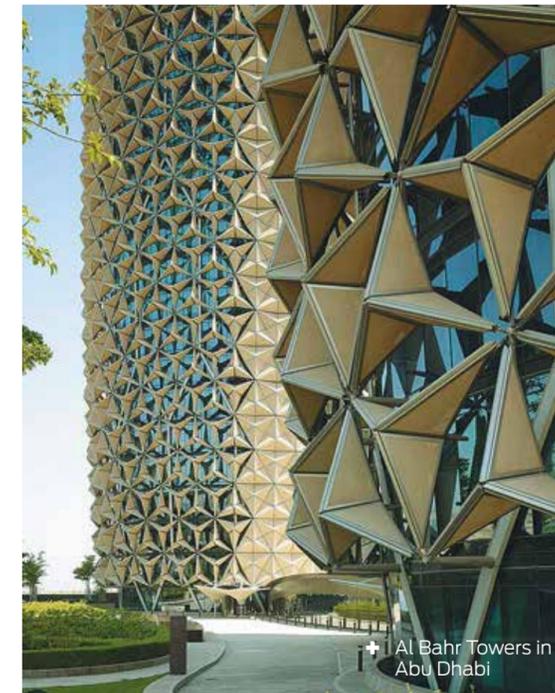
For a property to be truly energy efficient, it is imperative that adequate controls are in place for flexibility of operation, essentially enabling the occupant to consume energy when it is needed and where it is needed.

For example, if the entire ground floor in a villa is controlled by one thermostat, the entire space will be cooled even when only one person is present in any one room of the floor, thereby wasting cooling energy. A villa with one thermostat for each room has sufficient flexibility of control leading to low energy costs.

A properly functioning home automation system will be a great asset.

The same principle applies to a property in a tower — the more the number of thermostats, the lower the expected energy consumption. This analogy can be extended to the number of lighting switches as well.

Finally, if one were to choose flexibility of control over efficient equipment, it is perhaps preferable to go for operational flexibility. ■



✦ Al Bahar Towers in Abu Dhabi

✦ Sougata Nandi developed and implemented the region's first sustainable development policy for Tecom Investments. He set up the Emirates Energy Star programme in 2011 and other energy and water conservation projects across the UAE.



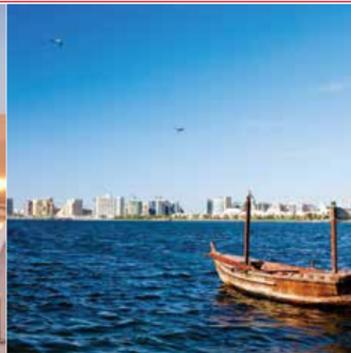
✦ The Change Initiative building in Dubai features solar panels and heat-reflective paint

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