

## Dubai Sustainable City: Shaping Future Cities



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The Sustainable City is a modern application of social, economic and environmental sustainability in the built environment. As the first operational Net Zero Energy development in Dubai, the project is an international showcase for sustainable living, work, education, and recreation.

Located in Dubailand and spanning over 460 ha, The Sustainable City provides a complete suite of social amenities and environmental features. Completed in 2016, the first phase of the project is comprised 500 villas grouped into five residential clusters, a mosque, a kindergarten, a 15,000m<sup>2</sup> mixed-use facility, a farm, public amenities, and the equestrian centre. Phase 2 will comprise the Hotel Indigo, a comprehensive rehabilitation hospital, an international school, as well as Diamond Innovation Center.



## Environmental Sustainability

### Energy

For starters, the villas are north-oriented to avoid the sun. The narrow streets (called “sikkas”) inside the clusters maximize shading and reduce physical exposure. A suite of active design features including cutting-edge insulation, UV-reflective paint, energy-efficient air conditioning, LED lighting, solar water heaters, and energy-rated appliances, help reduce electricity consumption by up to 50% compared to conventional villas in Dubai.

The Sustainable City is installing 10MWp of solar panels. Solar rooftop panels in villas further reduce electricity imports by up to 30 percent annually. The combination of demand management and solar rooftop significantly reduce electricity bills, to levels not seen before for comparable buildings. Solar shaded parking bays produce additional electricity which supply common areas including street lights, bio domes, water features, wind towers (called “barajeel”), and public amenities.

### Water

The Sustainable City’s water strategy includes water saving devices and appliances, greywater treatment and reuse in productive landscaping, and blackwater treatment and reuse in non-productive landscaping. Villas consume up to 40 percent less freshwater compared to conventional villas, thereby reducing demand for desalinated water and corresponding

greenhouse gas emissions. The Sustainable City’s topography drains storm water into an intricate network of bioswales and a traditional ‘falaj’ system that help replenish groundwater reserves.

### Waste

The Sustainable City aims to achieve 100 percent waste sorting at source. Disposal bins are conveniently located in each cluster to encourage residents to separate their waste at source into five waste streams. The waste is collected by electric vehicles and sent to Tadweer (Dubai’s largest materials recovery facility), where the waste is recycled and traded. Green waste is composted on site and transformed into compost for public landscaping. Other waste streams are collected and treated separately – for example, used cooking oil from villas and restaurants are sent to a bio diesel production facility in Dubai.

### Air Quality

A number of ‘barajeel’ wind towers are strategically placed within each residential cluster, channelling cooler and less humid air into the plazas. A 30-meter green belt surrounds the development and provides an important ecological habitat for birds and reptiles. This greenbelt also helps reduce air and noise pollution, and provides shade on the cycling and horse tracks.



## Products

The villas were built using precast wall panels and easy-to-install construction elements which helped achieve time-saving and energy-efficient targets. Cut and fill operations were optimized to eliminate the import and export of aggregates further reducing carbon emissions from off-site transport. The street lights use laminated timber from sustainable forests and the rubberized tracks use crumb rubber from used tires. Light-coloured paving materials create a cooler micro-climate. In Phase 2, materials will be selected based on their Life Cycle Assessment.

## Mobility

The Sustainable City's transportation strategy encourages residents to rely less on motorized transport and more on walking and bicycling. The clusters are car-free zones and therefore only accessible on foot or by electric buggies through the sikkas that link the city together. Electric charging stations are available to Electric Vehicle owners, free of charge. The Sustainable City will soon launch an EV car sharing program to encourage its residents to discover solar-powered electric mobility and to forego their second family car.

## Urban Farming

The Sustainable City's central urban farm comprises 11 temperature-controlled bio domes. Residents can grow their own herbs and vegetables inside these bio domes or along the 'falaj' system. The Sustainable City is self-sufficient in herbs and leafy vegetables and has started to grow a selection of other vegetables including zucchini, eggplant, sweet

corn, and tomatoes. Date palms along the ring road and the central farm produce 40-50 tonnes of dates annually. Overall, the city's urban farm and productive landscapes reduce the carbon footprint of the residents by eliminating transportation and storage needs.

## Social Sustainability

The Sustainable City is more than engineering and technology. The project promotes a vibrant culture of sustainability among its residents, staff, and visitors. The infrastructure in The Sustainable City supports cultural events, sports, and recreation through ample outdoor spaces such as playgrounds and plazas. Sports amenities including courts, a community pool, cycling tracks, outdoor fitness stations and an equestrian club help residents to maintain a healthy lifestyle. In addition, The Sustainable City hosts a variety of events throughout the year (such as meet & greets, environmental celebrations, and seminars) to create a cohesive community that advocates tolerance, respect and engagement with people from different cultures, background and beliefs.

Diamond Square will offer cutting-edge healthcare service for adults, and children, including children with special needs. An international school will set a new standard for world-class education, integrating sustainability throughout the learning journey, while delivering high academic standards and innovative teaching practices. For the younger ones, CreaKids nursery offers an international childcare and

educational brand. The curricula in the nursery (and the school) will complement the progressive-minded sustainable model of The Sustainable City, and help shape a new generation of compassionate problem solvers.

## Economic Sustainability

The Sustainable City is demonstrating that environmentally sustainable building is also economically sustainable. During construction, sustainability related investments have been more than compensated by costs savings resulting from sustainable design. Residents benefit from greatly reduced energy and water bills, without paying a premium for their home. Residents also benefit from zero net service and maintenance fees as a result of the unique revenue sharing scheme from mixed-use facilities.

