



↑ A new urban district is being created in the heart of Milan – Porta Nuova. 20 high-rise buildings, parks, underground car parks and a metro station are currently being built here in accordance with stringent sustainability criteria.

# Milan's new skyline

Porta Nuova, Milan, Italy

**A district with a completely new design is currently being created in Milan: Porta Nuova. By the year 2015, this area will be home to 20 high-rise buildings, parks, a new metro station and underground car parks. Thanks to its rigorous sustainability concept, Porta Nuova could serve as a model for future urban development projects. The new district contains a host of prestigious buildings, including UniCredit Tower and the two "Bosco Verticale" residential towers. As with all the projects constructed in the new district, both of these structures also meet the stringent requirements of LEED certification.**

Milan, the second-largest city in Italy, was the country's main industrial center for many years. Heavy industry has since moved elsewhere, and the Milan of today has long since transformed into a financial and services center. From an urban development perspective, Milan is therefore faced with the challenge of reusing large derelict areas of land. It is not a question of simply creating high-quality residential and office buildings, but also infrastructures that provide a groundbreaking answer to the changed economic, urban development and environmental conditions prevalent today in densely populated metropolises throughout the world.

In Milan, this problem is being addressed in an area measuring 290,000 square meters around the Garibaldi railway station. For 50 years, people in the city had been discussing what to do with the district located right in the heart of Milan that borders the exuberant artistic and cultural district of Brera. Thanks to the financial backing of the international real estate firm Hines – and with Expo 2015 in Milan in mind – an ambitious concept (entitled "Porta Nuova") was developed

for the redesign of the Garibaldi district, which was then divided up into three areas: Porta Nuova Garibaldi, Porta Nuova Varesine and Porta Nuova Isola. Thanks to its rigorous landscape and sustainability concept, the Porta Nuova project could serve as a model for future urban development projects.

#### **Sustainable district**

Construction work began in 2008. 20 high-rise buildings, parks, cultural centers, a new metro station and underground car parks are under ongoing construction in the three project areas. Around 360,000 square meters will then be available for new offices, apartments and commercial premises. Internationally renowned architects such as Cesar Pelli, Nicholas Grimshaw, Stefano Boeri and Kohn Pedersen Fox were commissioned to design the new high-rise buildings.

One of the project's first completed buildings is the UniCredit Tower high-rise complex in Porta Nuova Garibaldi, designed by Cesar Pelli. The bank headquarters is constructed from glass and steel and comprises



↑ Already completed is the 231-meter-high UniCredit Tower designed by Cesar Pelli, a high-rise complex that towers over all the other buildings.

**UniCredit Tower, Porta Nuova Garibaldi, Milan (IT)**  
 Building owner: Hines Italia, Milan (IT)  
 Architects: Pelli Clarke Pelli Architects, New Haven (USA)  
 Completion: 12/2012  
 Plumber: Cefla Impianti Group, Milan (IT)  
**Geberit know-how**  
 Sigma concealed cisterns 12 cm (UP300)  
 PE piping systems  
 PE Solvent fittings d110  
 → Green building: LEED Gold certification

a total of three towers, the largest of which stands at 231 meters. The complex is therefore currently the tallest building in Italy. The impressive structure is also the first green building in Porta Nuova to be completed and LEED-certified. The structure accommodates 4,000 employees and should reduce its CO<sub>2</sub> emissions by around 30 percent. Among other things, this considerable resource efficiency includes low energy and water consumption, the use of rainwater and the use of recycled materials during construction. Furthermore, the design of the interior and work areas is based on innovative office concepts that aim to improve communication and teamwork. Around 80 trees between three and eight meters in height were planted in the open spaces inside the building reserved for recreation and business meetings, ensuring that a feeling of nature is also experienced in the building during breaks, meetings



↑ The two "Bosco Verticale" residential towers will feature a living area of 50,000 square meters and 10,000 square meters of forest.

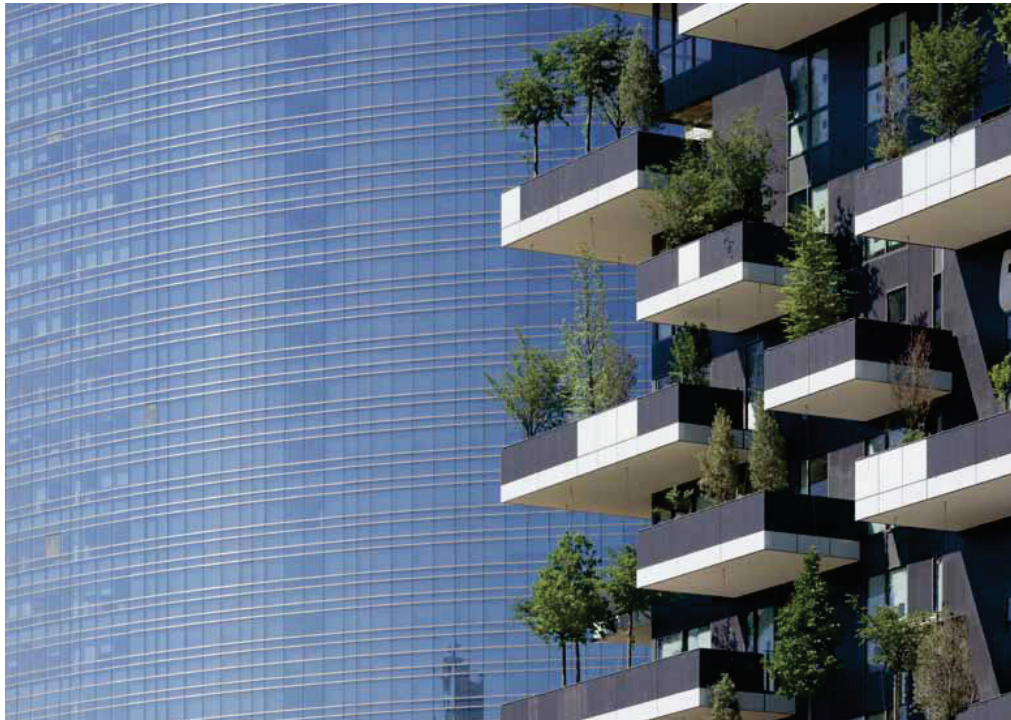
and conferences. 30 percent of the total office space is reserved for these open spaces.

Like UniCredit Tower, all of the other high-rise projects must also meet the stringent requirements of LEED certification. However, environmental friendliness is not just limited to the buildings themselves – the entire Porta Nuova district is traversed by a network of bike lanes. The center of the newly designed district features a large park around which the high-rise buildings are being built. This park constitutes the heart of Porta Nuova, where people can travel from one area to the next without needing to cross a road. Milan-based architect Stefano Boeri, who also designed the much-discussed "Bosco Verticale" project, was responsible for the design competition for the park.

**Living in a vertical forest**

Just under five minutes away from UniCredit Tower are the two "Bosco Verticale" residential towers, which are currently being completed. This project is part of "biomilano", a manifesto written by Boeri on the sustainable urban development of Milan. According to Boeri, the idea for the green residential towers came to him during a visit to Dubai in 2007, where he realized the explosive rate at which environmentally inefficient high-rises are being thrown up around the world. This situation prompted him to think about realistic sustainable alternatives in the area of high-rise construction. His solution came in the form of green, organic facades, which became an integral part of the "Bosco Verticale" project that he designed for the Porta Nuova Isola area. The innovative residential buildings are a prime example of a sustainable building system of the future.

**Bosco Verticale, Porta Nuova Isola, Milan (IT)**  
 Building owner: Hines Italia, Milan (IT)  
 Architects: Stefano Boeri Architetti, Milan (IT)  
 Completion: end of 2013  
 Plumber: COIMA, Milan (IT)  
**Geberit know-how**  
 Sigma concealed cisterns 12 cm (UP300)  
 Actuator plates Bolero  
 Mepla piping systems  
 PE piping systems  
 PE Solvent fittings d110  
 → Green building: nominated for LEED Gold certification



↑ The first mini forests are already growing on the balconies. In the background, the glazed facade of UniCredit Tower.

The "vertical forest" – as "Bosco Verticale" translates in English – aims to actively contribute to the regeneration of the environment and increasing biodiversity in major cities. With his unusual project, Stefano Boeri intends to help greatly improve the well-being of people in today's densely populated metropolises. Measuring 80 and 112 meters, the two towers feature a living area of 50,000 square meters and an additional 10,000 square meters of forest, with 730 trees, 5,000 shrubs and 11,000 perennials and groundcover on the building facades. Each of the apartments in the two residential towers comes with a spacious balcony with its very own mini forest that offers protection from the sun, noise and the polluted urban air. The balconies extend 3.35 meters from the apartments on all four sides of the building. Their irregular arrangement was de-

signed to create a natural effect, while also providing sufficient room for the plants.

Before construction got underway, complex and lengthy studies first had to be carried out, for which Boeri assembled an interdisciplinary team of architects, structural engineers and botanists from the Faculty of Agricultural and Food Sciences at the University of Milan. They investigated which trees are suited for the project based on their resistance to cold, wind and drought. Structural and safety aspects had to be clarified and the right location had to be found for each tree in terms of sunlight, wind and humidity. The ideal plants were cultivated in a greenhouse two years before construction got underway.



Other Porta Nuova projects in which Geberit is represented with its products:

- 1 UniCredit Tower
- 2 Bosco Verticale
- 3 Diamond Tower, Kohn Pedersen Fox Architects, in collaboration with Jacobs Italy (completion end of 2013): PE-HD piping systems, PE Sovent d110
- 4 Porta Nuova Offices, Kohn Pedersen Fox Architects, in collaboration with Jacobs Italia (completion end of 2013): PE-HD piping systems
- 5 Palazzo Lombardia government building, Pei Cobb Freed & Partners (completed in 2011): PE-HD piping systems, Pluvia roof drainage systems
- 6 Building E1-E2, +Arch- (completion end of 2013): PE-HD piping systems, Pluvia roof drainage systems



Geberit PE Sovent d110 – a sustainable solution for high-rises

The flow-optimized Geberit PE Sovent fittings facilitate an optimal layout of waste water discharge stacks in high-rises. They prevent hydraulic closures in the discharge stacks, which on the one hand increases the capacity of this pipe by up to four times and also makes the installation of a separate ventilation pipe unnecessary. Unlike with roof drainage systems, for instance, negative pressure in a building's discharge pipes is to be avoided. This essentially clears out the traps, making them ineffective. For this reason, conventional discharge stacks without Geberit Sovent are equipped with an air bleed. With the Geberit PE Sovent d110, hydraulic know-how from Geberit is now also available for discharge stacks with a diameter of 110 mm. This discharge stack size enables the drainage of waste water from up to 66 residential units and is primarily installed in high-rise hotels, residential and office buildings, such as in the 231-meter UniCredit Tower and the two "Bosco Verticale" residential towers.

With products such as the PE Sovent fittings d110, Geberit also helps with the implementation of green building concepts and standards such as LEED. During the development process, all Geberit products are optimized in terms of their environmental friendliness, resource efficiency and durability and are comprehensively aligned towards sustainability in eco-design workshops. PE pipes from Geberit perform very well from an ecological perspective. They are durable, made of unproblematic materials and distinguished by their minor environmental impact during their usage phase. The environmental impact associated with production has been significantly reduced, and these products can be recycled 100%.

"The two residential towers create a pleasant microclimate, with the high density of plants filtering dust particles from the air," explains Boeri. The specific selection and variety of trees and shrubs ensures that the right level of humidity is created and CO<sub>2</sub> is absorbed. Plant irrigation is mostly taken care of through the use of gray water, while power is supplied by wind and solar energy systems installed on the buildings. "Bosco Verticale" therefore not only improves the quality of life of its residents, it also reduces their ecological footprint.

Construction work is still underway in Porta Nuova. All the high-rises are to be completed and LEED-certified by 2015, at the latest. ←

→ [www.porta-nuova.com](http://www.porta-nuova.com)