

Further information  
Skanska AB  
www.skanska.com

**Contact**  
Noel Morrin,  
SVP Sustainability &  
Green Construction  
noel.morrin@skanska.se

## Atrium City, Poland

### Case Study 58

Atrium City is an energy efficient class A office building in central Warsaw, Poland, that was the first Polish commercial building to be certified according to the EU GreenBuilding programme.

### Aspects of Sustainability

This project highlights the following:

#### Social Aspects

Human Resources  
Corporate Community Involvement  
Business Ethics  
Health and Safety

#### Environmental Aspects

Energy and Climate  
Materials  
Ecosystems  
Local Impacts

#### Economic Aspects

Project Selection  
Supply Chain  
Value Added



### Project Introduction

Atrium City is a stylish and modern office building with a glazed atrium that runs through the heart of the building. The northern part of the development is fourteen-storeys in height, whilst the southern section is eight-storeys high. Atrium City was inspired by Scandinavian architecture, and features an elegant glazed curtain wall facade with glass panoramic lifts. The building's main tenants include a global professional services company, an international property consultants and a major global bank.

Skanska Property Poland developed the US\$ 100 million Atrium City project that was completed in May 2009. The building has 18,586 m<sup>2</sup> of leasable office space and 1,090 m<sup>2</sup> of space for 7 ground floor commercial units, including a restaurant, caf and kiosk. The development also includes three levels of underground parking for up to 218

vehicles. Atrium City is a continuation of the successful Atrium Complex, developed by Skanska adjacent to Jana Pawla II Avenue, and the building has been designed to be consistent with the surrounding developments. Skanska sold the Atrium City building to the German investment fund DEKA in September 2008 for approximately US\$ 150 million, and is planning to expand the Atrium Complex with two further office developments.

Atrium City was the first Polish commercial building to be certified according to the EU GreenBuilding programme, a voluntary initiative aimed at improving the energy efficiency of non-residential buildings in Europe. A building must consume at least 25 percent less energy than the national standards demand in order to be certified according to the programme. Skanska Property Poland is a member of the GreenBuilding Programme.



Skanska is in the process of applying for Leadership in Energy and Environmental Design (LEED) certification for its own office within the building, which is expected to be confirmed in the second half of 2009. (Additionally, fellow Atrium City tenant, Deutsche Bank is applying for LEED certification of its office, independently.) LEED is a voluntary U.S. GreenBuilding Council certification intended to encourage and guide the construction of more sustainable and energy efficient buildings.

## Contributing Toward Sustainable Development

Atrium City is an energy efficient class A office building that provides healthy working environments for tenants. The building is designed to be functional and flexible to promote a long building life span. Atrium City also contributes to sustainable urban planning as it reused a brownfield site within central Warsaw. During construction, environmental impacts were avoided and construction waste was recycled off-site. Environmentally responsible construction materials that met the highest Polish standards were used on the project. Local workers, subcontractors and construction materials were prioritised to benefit the regional economy and Atrium City has helped to ease the chronic shortage of high quality office space in central Warsaw.

## Social Aspects

### Occupational health and safety

There were four minor incidents during the construction of Atrium City and the Lost Time Accident Rate was 4.5 per million hours worked. Special safety measures to avoid serious accidents included the compulsory use of safety belts for all workers and subcontractors working at height.

### Learning from previous Atrium Complex projects

Atrium City is the seventh phase of the Atrium Complex to have been developed since 1995. Skanska has integrated the latest construction techniques into each project and built on the experience of previous Atrium Complex developments. For example, the advanced spatial and structural techniques to allow greater ceiling heights in the Atrium City project evolved from earlier Atrium Complex projects.



## Healthy office environment

Atrium City was designed to create high quality and healthy working environments for tenants. Large sections of the facade, including the high section of the building, are glazed and large windows have been used to ensure that natural light penetrates the open planned floors. The central glazed atrium also ensures that the core of the building is lit with natural light. Low-VOC materials were used on the project and all materials comply with Skanska's environmental policy to promote healthy indoor environments. The ventilation system uses chilled beams that distribute air evenly and are hygienic, as they do not allow moisture, dust and dirt to collect on the ventilation coil, and the surfaces of the beams are flat and easy to clean. The ventilation system is also quiet and emits less than 27 dB of noise. Individuals can control and customise the climatic conditions in the office to suit personal comfort and Atrium City has an outdoor terrace on level 8 where tenants can relax.

## Functional and flexible building

Atrium City has been designed to be as functional as possible, with modern electrical and telecommunications infrastructure, 6 high-speed elevators and a freight elevator, and a Building Management System that controls the building's mechanical and electrical equipment. The building is also designed to be flexible to promote a long useful life span. The office spaces are open planned without internal columns to accommodate a range of office styles and layouts that can meet the unique needs of present and future tenants. The office spaces are fitted with 80 mm raised-floor systems that allow concealed under-floor cable distribution and do not compromise the flexibility of the space. Atrium



City has various sized offices from 337 m<sup>2</sup> to 1,849 m<sup>2</sup> in area, to accommodate different client requirements.

### **Sustainable urban planning and public transport**

Atrium City was constructed on a brownfield site in central Warsaw, close to a range of services and amenities. The development has good access to public transport with 15 bus routes and 5 tramlines serving the immediate surrounding area. Atrium City is also a 5-minute walk to the Warsaw Central Railway Station and 3 minutes from the nearest underground station. Warsaw Airport can be reached from Atrium City in around 25 minutes.

### **Economic Aspects**

#### **Local employment, subcontractors and construction materials**

There were more than 500 workers on site at the peak of construction, of which a third were from Warsaw. Skanska drew on its established network of local subcontractors and suppliers and the most common construction materials were sourced locally, including mortar, flooring and roof insulation. Almost all construction materials were sourced within Poland, although the elevation stone for the project was sourced from Italy via a local supplier.

#### **Efficiency savings for tenants**

Atrium City consumes around a third less energy per area than the Polish energy standards. Tenants can consequently expect to have relatively low energy costs and individual energy meters promote

further tenant savings. Specific features that reduce operational costs include a “free” cooling system that uses naturally cold outdoor air to cool the building. The chilled beam air conditioning system also has maintenance costs that are typically 90 percent lower than a fan-coil ventilation system, as it has no moving parts and does not require replacement filters.

#### **Local economic development**

Atrium City is a continuation of the successful Atrium Complex, located along one of Warsaw’s most popular business streets, Jana Pawla II Avenue, and will allow more businesses to locate their offices in central Warsaw. There is a chronic shortage of high quality office space in central Warsaw, which the development will help to alleviate.

### **Environmental Aspects**

#### **Minimising environmental impacts during construction**

Detailed site environmental inspections were conducted twice a month in accordance with the





project plan. The only recorded environmental issue on site was a small oil leak from a faulty pipe, which was immediately cleaned up with emergency equipment and resulted in no permanent environmental damage. The project plan also prohibited site activities before 6 am and after 10 pm to avoid disturbing nearby apartment blocks.

### **Waste management**

Almost 60 percent of the project construction waste was segregated on site and recycled at off-site facilities. Sections of the building were prefabricated off-site, which reduced the amount of site construction waste generated and the number of deliveries to and from the project.

### **Environmentally responsible construction materials**

All materials and finishes used in the Atrium City building were in accordance with Skanska's Environmental Policy and the highest Polish environmental standards. Environmentally responsible materials included low-VOC (Volatile Organic Compound) paints, cement mortar and self-levelling flooring. Natural stone was used on the project, such as for the atrium flooring. The stone was locally sourced and hewed before delivery to the site. Many building materials used in the construction of Atrium City are fully recyclable, such as the natural stone, aluminium, steel and glass.

### **Energy efficiency**

An external auditor confirmed that Atrium City's energy consumption is 32.5 percent lower than required by the Polish energy standards for commercial buildings. The office and garage levels are designed to annually consume 87 kWh/m<sup>2</sup>, and the ground floor retail spaces 158 kWh/m<sup>2</sup>. Atrium City has a compact form, a high level of airtightness and thicker insulation than required by the Polish building regulations to reduce energy loss. The ratio of glazed to insulated fa ades was designed to be 60 percent in order to optimise energy efficiency by avoiding excessive heat loss

or solar heat gain. The glazing is also tinted and insulated with argon gas to provide a low g-value of 0.28, which further reduces excessive solar gain or heat loss, and the need for space heating or cooling. The glazed fa ades and windows have low u-values of 1.1 W/m<sup>2</sup>K and 1.4 W/m<sup>2</sup>K respectively, which helps to insulate the building. According to an analysis by the Warsaw University of Technology, low u-values and reduced passive solar gain decrease the energy consumption for heating and cooling by around 30 percent and the total energy consumption of the building by around 15 percent.

The energy efficient cooling and under floor heating systems were designed in consideration of natural convection to minimise the amount of energy required to circulate air in the office spaces. The chilled beam air conditioning system, for example, has a low air velocity between 0.2 and 0.25 m/s. The cooling system can also use naturally cool outdoor air when the outside temperature falls below 5 degrees Celsius, which reduces the building's cooling load without consuming energy for cooling. The Atrium City heat recovery system recycles an average of 60 percent of the heat from the office exhaust air, and the remaining air is used to heat the central atrium and the underground parking levels. The parking levels consequently require no additional heat source. The extensive use of natural light and efficient T5 fluorescent lighting systems reduce the energy consumption from artificial lighting. All common area lighting is controlled by the Building Management System, which adjusts the intensity according to time channels.

### **Learning From Good Practice**

The EU GreenBuilding programme provided the Atrium City project with a useful energy efficiency benchmark to exceed. The Atrium City project was also guided by tenant requirements for flexible and healthy working environments.

