CASE STUDY

Segment: Smart City
Market: Middle East

Project: King Abdullah Financial District

About the project: KAFD is a smart city within a city, that is redefining Riyadh's skyline with outstanding buildings inspired by the native landscape. KAFD empowers businesses through access to advanced office infrastructure and sustainable smart city solutions.

OVERVIEW

King Abdullah Financial District (KAFD) is located in Riyadh, the capital of Saudi Arabia, and upon completion will be the largest real estate development project in the world. Promoted by the sovereign fund, KAFD will constitute a special economic zone that will increase the attractiveness of Saudi Arabia as a global destination for foreign investment and will make this financial district become the headquarters of numerous international companies.
The development has been designed by over 25 renowned global architects and extends over an area of 1.6 million square meters. The district will be comprised of 95 buildings, including 64 towers, intended for residential and commercial use.

Location: Riyadh, Saudi Arabia
Total area : 1,6 million square meters (sqm)
Certification: Largest LEED certified mix-use district in the world
Waste handling: Envac AWCS
Residential units: 5,000
Commercial area: 1 million sqm of Grade-A office space, 220,000 sqm of retail and F&B space and 110,000 sqm of entertainment space

Envac has been behind the waste strategy for the King Abdullah Financial District (KAFD) project. Unlike traditional waste management systems, where waste is manually collected and placed into a compactor and collected via trucks, Envac's flexible system will be connected to all areas in the district. The system will collect waste in an underground pipe network that connects to a single collection station, where the waste is then stored in sealed containers which are removed from the site once full.

How will the system work?
To drive up resource recovery rates, the project will adopt a two-fraction system, general and recyclable waste. Each waste fraction will be deposited into separate waste inlets, which will connect to multiple vertical gravity chutes.

The use of inlets will eliminate the possibility of overflowing waste, seen in traditional waste collection systems. The waste is temporarily stored at the valve until a collection cycle is activated by a level sensor or a timed sequence controlled by Envac's Automation Platform (EAP). The vacuum exhausters, located at the collection station, are energised and create a negative pressure within the pipe network. Once the required vacuum pressure is reached, EAP controls the valve openings to create a flow of air within the pipe network. The discharge valves then open to allow the waste to enter the system reaching speeds of 70 kilometers per hour. The air which carries the waste is consequently treated through a multistage filtering system, eliminating all potential odours. Each waste collection station in the Envac system is situated remotely or offsite,
removing the need for waste collection trucks to enter the development.

ENVAC

90%
lower carbon emission

System reduces carbon emissions from garbage collection trucks making city life greener, smarter, and more sustainable

160
inlets

21 kilometres of underground pipe network along with 16 extractors of 110 kW are part of the system

140
tonnes of waste per day

2 different fractions, general and recyclables, and waste from 16 litter bins located on the Wadi pedestrian boulevard

6
cyclones

Cyclone separates waste particles from the air for clean, efficient waste removal and reducing the risk of contamination

STATE-OF-THE-ART AUTOMATED WASTE COLLECTION SYSTEM AT KAFD

- Designed and built as the world's largest automated waste collection facility serving over 64 towers and a working population of around 12,000 inhabitants
- Envac's system reduces carbon emissions as a result of reduced waste vehicle traffic, reduced fuel emissions, and idling time for trucks, contributing to a safe environment
- Automated waste collection eliminates the smell, unsanitary conditions, and mess associated with traditional waste collection
- The underground system creates more space by replacing bulky recycling stations with lean waste inlets handling all sorts of recyclables and waste
- Recycling waste through clean separation leads the way in shaping a more sustainable future and a circular economy

"KAFD's commitment to sustainability is evident in its methodology of using clean energy, its environment-friendly designs, as well as its advanced automated system to collect and sort waste. Automated waste collection eliminates the entry of garbage trucks into KAFD and reduces carbon emissions.

ENVIRONMENTAL IMPACT

1. LEED platinum certified

Awarded the US Green Building Council (USGBC) Leadership Award in recognition of its sustainability initiatives and has also achieved the platinum certification from the Leadership in Energy and Environmental Design (LEED) program. These make this project an example of a sustainable city on a global scale.

2. Sustainable handprint & Vision 2030

The project has particularly managed to reduce energy consumption by 50%, uses recycled water to maintain greenification and Envac's automated system for waste collection that uses an underground pipeline to collect and segregate recyclable waste.

Tackling the impact of climate change in urban environments by developing heat resilience and sustainable cooling solutions. This will reduce temperatures throughout the district, reflecting the commitment to sustainable solutions. With 39 skybridges planned, there are many sustainable modes of transport available in the district that improves a lower-carbon lifestyle.

ENVAC