



# Kinaxixi Luanda, Angola

## Introduction

In Luanda, Angola, the large Mixed Use Development Complex Kinaxixi is under construction. The complex is composed of a shopping mall on the lower levels with a residence and office tower placed on top. A building like this can influence the local environment negatively. The project team consisting of EnerOne, 3 drivers and ONE Simulations was asked to quantify these effects.

## Description

The influence of this MXD building on its surrounding environment is evaluated by ONE Simulations for three effects:

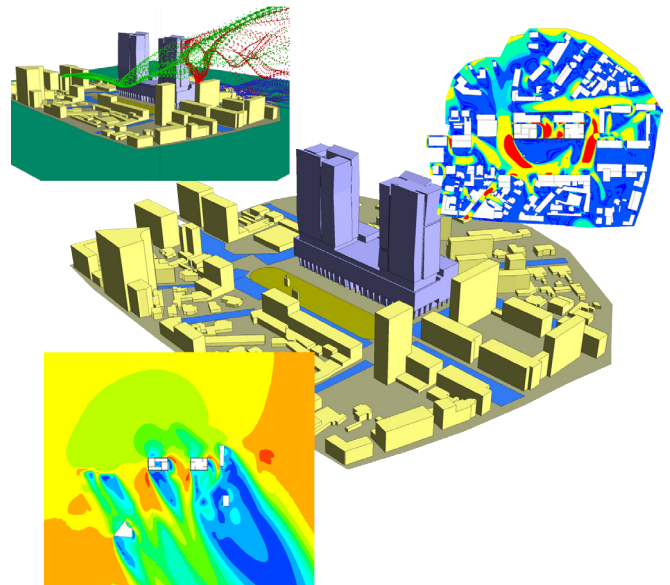
- Dispersion of diesel generators emissions
- Dispersion of water vapour emitted by cooling towers
- Wind comfort on the terrace and direct surroundings

Detailed spatial knowledge of the airflow, heat, humidity and emission dispersion in the surroundings is gained by CFD simulations. The surrounding buildings are included in the model, as shown in the figures on the right. Further surroundings (>300 meter radius) are modelled as terrain roughness to obtain the correct upstream flow pattern.

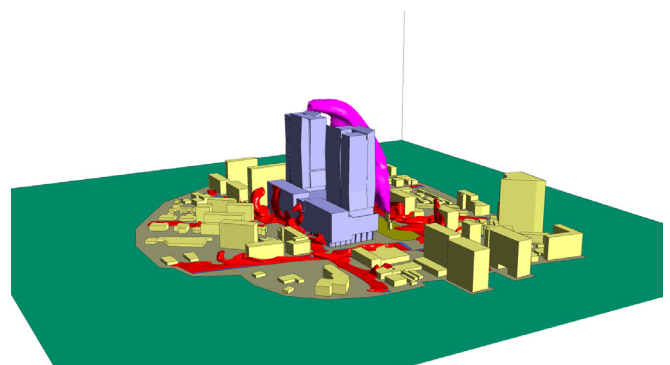
## Objective

The impact of the generator and cooling tower were investigated for 4 wind directions at low wind speed (0.5 m/s), since this is the most pessimistic scenario. In more than 80% of the time higher wind speeds will occur in Luanda. The resulting pollutant concentrations from the systems were compared with the resulting concentration from local traffic. The effect of the generator and cooling tower on the local air quality is about 100 times less than that of the high density traffic.

The impact of the building on the local wind climate is investigated for 2 wind directions with 2 m/s at 10 meter height. The results show where the local wind velocity exceeds the normal wind velocity. This analyses indicates the expected local wind climate. In general the wind climate on ground level is not changed too much by the new buildings. The wind climate on the terrace can be uncomfortable with stronger winds.



The simulation model with different types of result visualization.



3 dimensional visualization, in purple dispersion of emission from the diesel generator plant and in red from the traffic.