

# Academisch Medisch Centrum (AMC)

## Hospital

### Main CHP project indicators

Heat capacity (total) CHP (including LT) Including boilers	kW <sub>th</sub>	12.000 54.000
Electrical capacity (total)	kW <sub>el</sub>	12.150
Technology	Motor engine	
No. of units	3 + 1 optional	
Manufacturer	Wärtsilä 12V32DF	
Type of Fuel	Natural gas, Fuel oil	
Heat: yearly generation <sup>1</sup>	MWh	approx. 60.000
Electricity: yearly generation	MWh	approx. 66.000
Year of construction	2013	
Total investment costs	EUR	Undisclosed
Financing	Loans	
State support	None	
Return of investment (payback period)	Years	Approx. 5 years <sup>2</sup>
Location	Amsterdam, Netherlands	

### Success factors

The AMC has an almost constant high heat load in combination with a large demand for electricity. This makes AMC a very interesting case for CHP, as all electricity and heat produced is used.

The CHP units provide an optimal heat delivery by means of steam and hot water on two temperature levels. The engine lube oil heat is used for hot potable water heating; the lowest temperature level is used for heating the power station. Because of the low temperature level, the overall energy efficiency is very high.

As the installation is based on a dual fuel engine, it is also operates as a no-break emergency power supply.

### Main barriers

The technical, organizational and logistical complexity was the main barrier for this project. AMC need to have a reliable supply of electricity, emergency power, cold, heat, breathing air and various types of water during renovation project.

The AMC project study was conducted in 2008 when it was obvious to install CHP in the health sector. Because a declining interest in CHP in the Netherlands, this is not so obvious anymore nowadays. This decline is caused by low electricity prices in combination with a lack of government support.

### Picture



### General description of the case

In the period 2004 - 2013 the Academic Medical Centre (AMC) in Amsterdam did a total renovation of the energy plant. DWA did the design and management of the project. The old CHP units, with in total 230.000 running hours, are replaced by three new 4 MWe dual fuel internal combustion

CHPs. The CHP units can be used as backup power on oil fuel with autonomy of more than three days. The electricity production and distribution is fully redundant to increase the reliability.

<sup>1</sup> No yearly figures available; the plant is just in 2013 in full operation.

<sup>2</sup> Result of feasibility study. Due to spark spread this figure will be less positive yet.

### Comparison: before and after

Already for thirty years, the AMC has been receiving power and heat through CHP. The old power station was at the end of its technical lifetime. Over time, the need for power has increased and the environmental requirements became more stringent. The use of dual fuel engines which result in a higher reliability of power supply is innovative for the health sector. In addition, the new CHP plant delivers energy at an increased total efficiency.

### Conclusions

Despite important barriers for CHP in the Netherlands, it is still possible to install well commissioned CHP plants in certain sectors.