

# Significant Savings Through Optimized Heat & Power Generation

Industrial & Commercial

## At A Glance

Application:  
Electricity and Direct Drying

Output:  
Electricity: 1.8 MWe  
Hot Air: 8.7 kg/s at 575°C

Benefits:  
88% Total Efficiency  
600 k€ Saved Per Year

## The Challenge

The gypsum board production process at SINIAT requires a continuous supply of 5.8 MWth heat and 1.8 MW electric power. SINIAT operated a radial gas turbine of old technology with low electrical efficiency 14%, delivering only 1.1 MW electricity. They wanted higher electrical efficiency along with high temperature heat. SINIAT wanted to install the gas turbine in the same area as the existing old radial gas turbine within just two weeks.

## The Results

Part of the gas turbine exhaust is ducted to two calciners. As the temperature requirement of the calciners is higher than the exhaust gas temperature, post-firing is applied. As the exhaust gases still have around 15% O<sub>2</sub>, post-firing is possible without additional ambient air blending. The remaining part of the exhaust is ducted to the board dryers, where a lower temperature but higher flow rate is required for the desired drying effect. Exhaust gases are blended with ambient air and post-firing is applied as necessary to control the temperature.



## SUCCESS STORY



Installation:  
1 X OP16-3A  
July 2014

Location:  
Delfzijl, Netherlands.

Customer:  
SINIAT BV

## The Solution

In 2013, SINIAT discovered the state-of-the-art, highly developed, all radial OP16-3A Gas Turbine which has an electrical efficiency of 26%. In a joint study OPRA Turbines and SINIAT assessed the feasibility of replacing the old cogeneration plant to be powered by the OP16 Gas Turbine. It was planned to use the OP16 Gas Turbine in island mode, delivering all the power output to the SINIAT plant. 8.7 kg/sec of exhaust gases leaving the turbine at 575 °C are ducted directly to the dryers and calciners. As the exhaust gases still contain 15% O<sub>2</sub>, post-firing can be applied at the dryer inlets when more thermal power is required.

As a result, the total electrical and thermal efficiency of the OP16 Gas Turbine exceeds 85%. This high total efficiency, combined with the low maintenance cost of the OP16 Gas Turbine, brings significant financial savings to SINIAT while reducing the CO<sub>2</sub> emissions. As the plant's production is dependent on the cogeneration system and there is only a short summer outage, the old gas turbine had to be replaced with the new OP16-3A gas turbine within just two weeks.

30%

Reduction  
of Emissions

28%

Saving of  
Energy Costs

40%

Low Annual  
Maintenance Activities

2  
Weeks

To Install  
the Unit



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