REDUCTION OF THE CO EMISSIONS OF A SHAFT KILN

Context

Our customer was operating a 80 tpd single shaft kiln equipped with central and lateral gas burners. The actual CO emissions of the kiln were by far exceeding the future EU threshold of 500 mg/Nm^3. It was thus necessary to find sustainable solutions to reduce those emissions.

Proposed solution

EESAC then proposed to lead at first a complete kiln audit, including a detailed analysis of the process parameters and a global heat and mass balance of the kiln. Then, based on the results of the kiln audit, EESAC proposed to lead short duration tests in order to assess the efficiency of the CO reduction levers identified before. Finally, once promising process conditions were identified, a second series of long duration tests were performed so as to monitor the long term behaviour of the kiln with the new process conditions.

Results

Thanks to the process optimisation, the CO emissions could be thus reduced by more than 90%. Figure 1 displays the kiln emissions with standard and optimised process conditions.

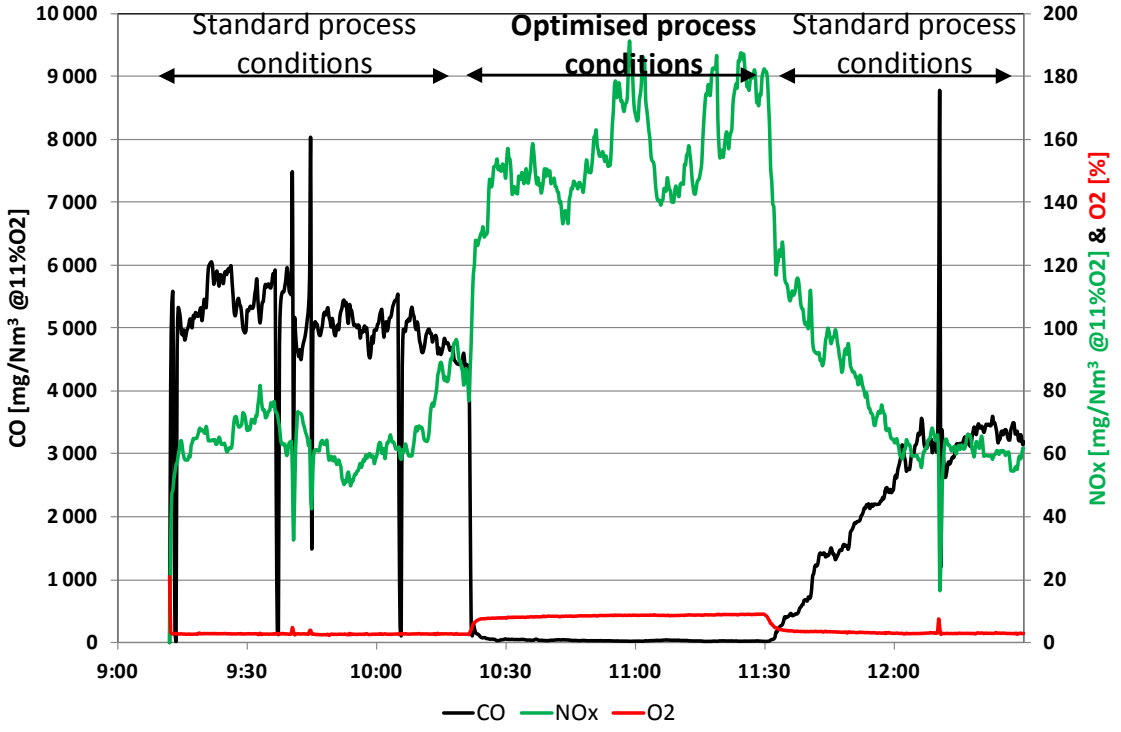

Figure 1: kiln emissions in standard and optimised process conditions

As indicated in Figure 1, with the optimised process conditions the CO level dropped from ± 5000 to 100 mg/Nm^3 (at 11% oxygen reference).

Besides, our customer noticed that in these conditions the homogeneity of the heat inside the kiln was significantly improved. As a result, an improvement of the lime quality (lime reactivity and concentration of residual CO_2 in the product) was measured.

The optimised process conditions are now fully implemented and will be soon transposed to the second kiln of the plant.