



Tata Steel Europe has used advanced analytics to model the complex reactions inside a blast furnace, thus helping to improve its efficiency and reduce costs.

THE CONTEXT



The blast furnace is a highly complex process that runs counter-current -- when gases ascend, the ferrous materials and coke descend. It has been impossible to analyse all the reactions that take place during this process with conventional statistical methods because of the complexity of the process, the simultaneous impact of a large number of variables and the size of the dataset. No one has attempted to use multiple statistical models to determine the relationships between the variables. The Tata Steel Europe team decided to use advanced analytics to unlock previously unknown relationships within the blast furnace process in order to derive a more thorough analysis of its efficiency.

THE INNOVATION



The introduction of advanced analytics to evaluate the efficiency of the blast furnace unlocked the potential to analyse a large dataset with a large number of parameters and also try different models simultaneously. This enabled the team to dissect all the relationships occurring simultaneously between the parameters within the blast furnace process. The team highlighted seven parameters, which were linked to an improvement measure in either the blast furnace operations or the selection of raw materials. This helped in more focused decision-making for the blast furnace operations.

KEY CHALLENGE



TO IDENTIFY THE INDEPENDENT VARIABLES FOR THE DATA ANALYTICS THAT COULD BE TRANSLATED TO THE COMPLEX PHYSICAL BLAST FURNACE PROCESS

The company tackled this by forming a team of blast furnace experts and data scientists. They held wide-ranging discussions in order to make the best selection of variables for the data analysis. When an existing variable was not the right option to select, the team would work on a synthetic variable that could display the physical process in the best way possible.

THE IMPACT



The advanced analytics has helped Tata Steel Europe to improve its blast furnace's efficiency, which has resulted in cost savings of

€5 MN