STEP 3 CASE STUDY

Operating an information system on resource efficiency

We continue here the case study of the dairy company presented in step 1.6 about introducing the results of an information system on resource efficiency. As already described there, the company's information system had helped the TEST Team to identify sources and causes of losses Here, we will show how the information system can be used to continuously manage priority flows and, simultaneously, monitor the benefits of the measures which have already been implemented.

28 measuring points were established in the information system for the monitoring energy efficiency in the steam and chilled water systems. Data from these monitoring devices started to be collected on daily basis as of July 4 2016, early on in the TEST project. Data was also gathered on daily production levels, expressed as weight of milk processed, and a record kept of the type of products made.

In April-May 2017, the company implemented a set of measures to increase the efficiency of the steam system, such as upgrading the piping and insulation and improving load matching. The company also refurbished the chilled water system, replacing all piping insulation, brushing and cleaning the condenser fins, insulating the ice bank tank and, in order to improve heat transfer, changing the configuration of the chilled water piping inside the ice tank.

As the steam system represented about 70% of the company's energy demand, significant savings were brought about after the implementation of the above-mentioned measures. For instance, the specific energy consumption of the plant dropped from 0.45 KWh/kg of milk processed in February 2017 to 0.36 KWh/kg milk a year later, representing a 20% improvement in one year. These improvements could be measured thanks to existence of the information system, the baselines calculated in step 1.6, the monitoring plan designed in step 1.8 and step 2, as well as to the monitoring done during step 3.

Figure 1 below shows the actual vs predicted energy demand for the steam boilers from July 2016 to February 2018.

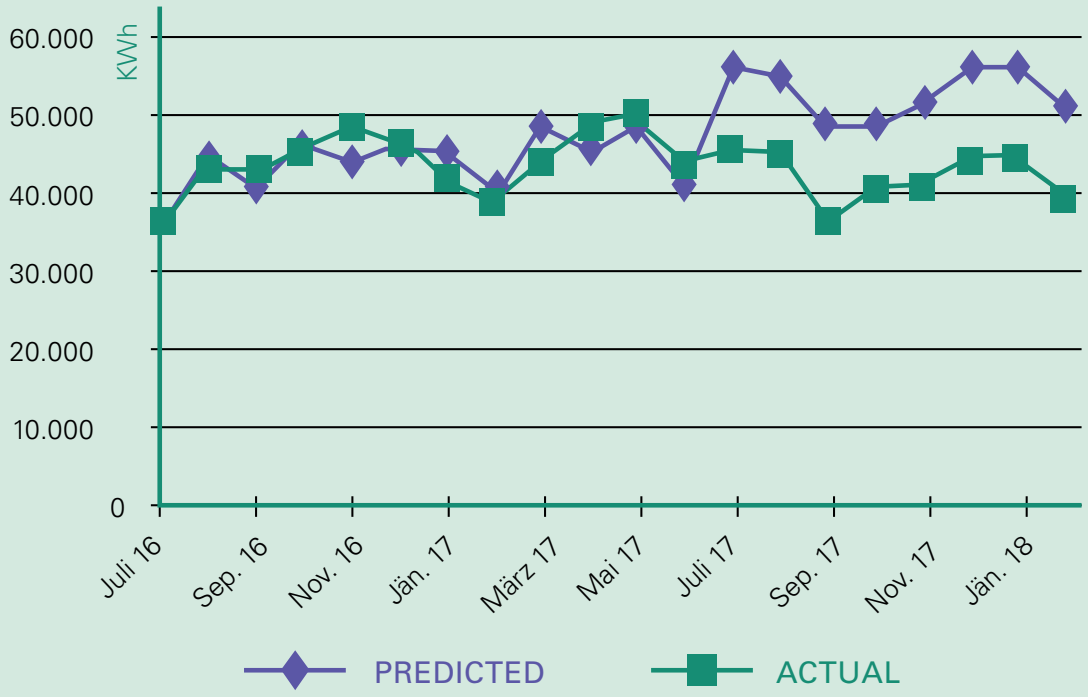

Figure 1 Predicted versus actual energy consumption within the steam system

The blue line represents the baseline generated using the initial set of data and the consequent initial regression analysis (theoretical consumption calculated utilizing the baseline). In other words, it represents the consumption the company would have had if the TEST project had not been introduced. The red line, on the other hand, represents the actual readings of energy consumption. Until June 2017 the two lines are well synchronized, showing that the baseline for original performance was well set up before improvement measures began to be implemented. However, after June 2017 a visible variation appears between the predicted consumption (calculated based on the original baseline) and actual consumption based on monitoring of actual performance; the difference represents the savings achieved as a consequence of the measures implemented in the steam system.

Figure 2 shows the cumulative savings over the 8 months which followed the implementation of the improvement measures.

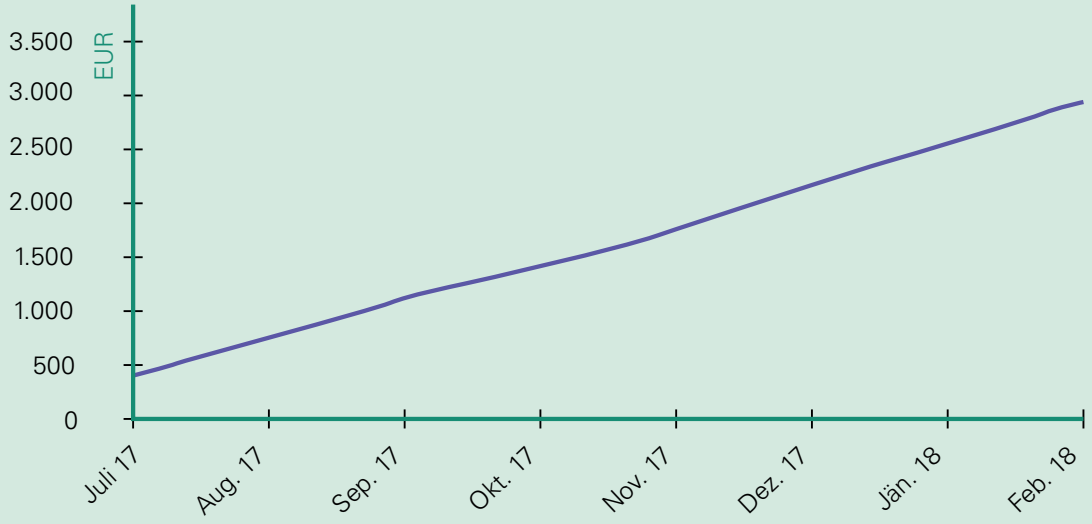

Figure 2 Cumulative money savings for steam system

The savings amounted to 7 tons of diesel fuel with a value of around € 3,000 (the margin of error in these estimates is +/- 15% considering the magnitude of the correlation coefficient); the actual payback period for improving the steam system turned out to be around 1.3 years compared to the initial estimate of 2 years (in other words, real energy savings were higher than had been predicted).

The programme of regular monitoring based on the established RECP information system also quickly revealed a hidden leakage of cooling water, as it highlighted a sudden and significant decrease of energy efficiency in the chilled water system. The company, thanks to monitoring, was then able to fix the leak immediately.

Today the board of managers appreciates its new RECP information system as an essential tool for running its operations.