STEP 1.6 CASE STUDY

Input-output imbalances

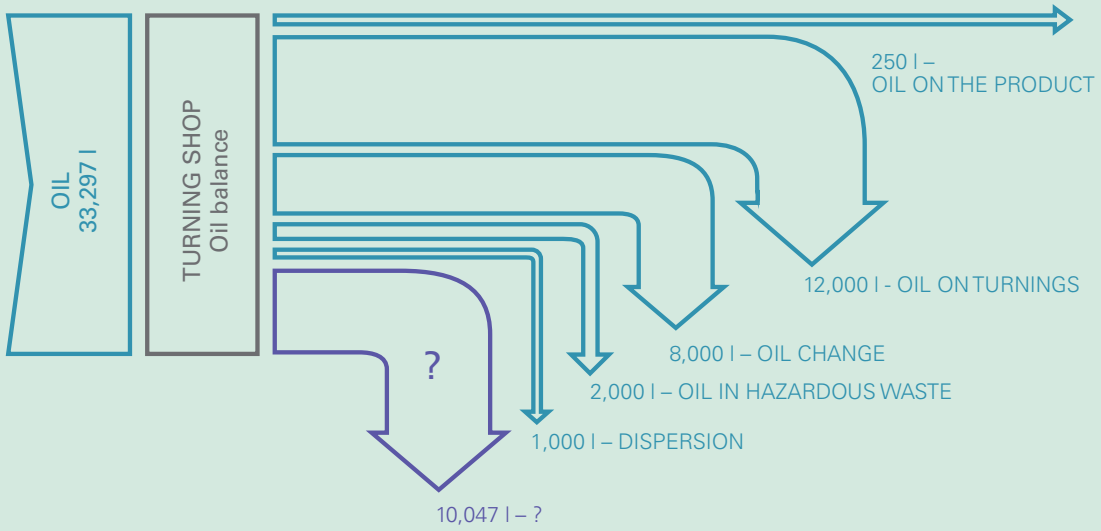

Figure 1

During step 1.4, an SME manufacturing ball bearings had identified cutting oils as one of the priority flows due to the associated high annual financial loss. During step 1.5 the turning shop had been identified as the cost centre with the highest NPO costs, and it was selected as a focus area. In step 1.6, the material flow balance for cutting oil was completed for the turning shop, using both measured and estimated data. The mass balance could not be closed as a significant amount of cutting oil, corresponding to approximately 30% of the total input, appeared to be lost "somewhere" in the company, as illustrated in the figure 1.

An on-site visit was implemented during the first working shift with the purpose of identifying the lost cutting oil flows. During the material analysis another material flow (wood chips), hitherto unrecorded, was identified. There was neither any record of the total amount of wood chips used in the turning shop, nor any data on the amount of wood chips in waste flows. Wooden chips were simply available in the turning shop for cleaning the floors with no record of use. However, its volume was estimated to be relatively low, which turned to be a mistake as showed later.

After repeated discussions with employees, it appeared that the lost oil flow was generated during the second working shift. It turned out that, due to a lack of regular supervision during the second shift, workers were keeping the covers of the turning machines open. A large amount of cutting oil was consequently spilling out onto the floor and employees were using wood chips to clean it up. They were then disposing the large amount of oily wood chips by mixing them with non-hazardous waste disposed of in plastic bags, and were apparently not aware of potential sanctions the company could be incurring for creating an environmental risk of this type. Particular turning machines were identified as the main source of the oil spillage (and the causes identified included not just the mode of operation but also the machine's design that allowed such wasteful operation). The method employed to handle the waste generated represented additional risks.

The detailed analysis at this step enabled the TEST Team to identify a set of resource efficiency measures. In addition to the obvious good housekeeping measures, new cleaning methods and procedures for recovering used oil from the turnings were also defined. Figure 2 shows the new complete balance.

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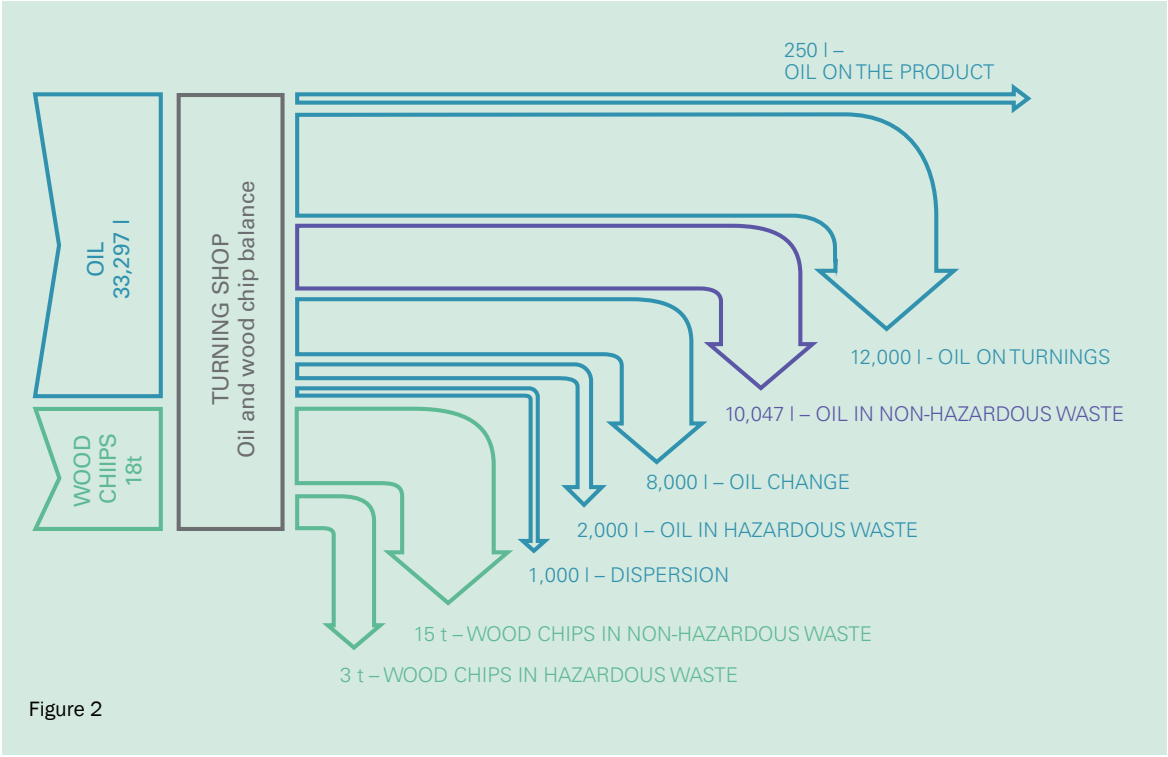

Figure 2