STEP 1 CASE STUDY

PRIORITY SETTING WITH THE MFCA TOOL

A Moroccan company active in the food industry, produces biscuits. The main processes are: mixing, kneading, baking, shaping, cooling, and packaging. At the beginning of the project, the company had little understanding of its total environmental costs. It had initially wanted to focus its TEST project only on energy, as it considered this to be the main priority. Yet, after the MFCA assessment undertaken in step 1.4 of TEST, based on preliminary estimates and production and accounting data from the previous business year, the company's management realized that raw material losses also represented a significant cost.

The total NPO costs were estimated at € 4,450,000 , which represented 15.6% of total production costs. 31% of total NPO costs were due to raw material losses. To put in another way, 10.3% of the company's total sales were lost (not converted into the final product). The breakdown of NPO costs is shown in table 9 (as there was no environmental management system or formal waste management in place, there were no waste management, end-of-pipe, or MFCA system costs):

NON-PRODUCT OUTPUTS (NPO)	PERCENTAGE DISTRIBUTION %
1. Costs of Material and Energy Inputs	**100%**
1.1. Raw and Auxiliary Materials	31%
1.2. Packaging Materials	4%
1.3. Operating Materials	8%
1.4. Water	3%
1.5. Energy	54%
2. Waste Management/End of Pipe Costs	**0,0%**
2.1. Equipment Depreciation of End of Pipe Equipment	
2.2. Internal Personnel	
2.3. External Services	
2.4. Fees, Taxes and Permits	
2.5. Fines, Remediation and Compensation	
3. MFCA SYSTEM COSTS	**0,0%**
3.1. Equipment Depreciation	
3.2. Internal Personnel	
3.3. External Services	
3.4. Other costs	
TOTAL COSTS (1. + 2. + 3.)	**100.0%**
4. ENVIRONMENT-RELATED EARNINGS	**0.0%**
4.1. Other Earnings	
4.2. Subsidies	
TOTAL ENVIRONMENT-RELATED EARNINGS	**0,0%**
TOTAL NPO COSTS	**100.0%**

TABLE 1: NPO breakdown at a biscuit factory

Next, the team identified KPIs and related baselines for all flows with significant NPO costs. Based on high NPO costs and potential for savings / improvement, energy and raw materials were selected as priority flows for detailed analysis. This successfully concluded step 1.4. Moving on to step 1.5 of TEST, the team first distributed the total NPO costs to cost centers. This allowed the company to start identifying its focus areas.

COST CENTERS	% OF TOTAL NPO
Reception-Storage Raw Materials / Finished Products	0.21%
Biscuit B1	9.53%
Biscuit B2	9.53%
Biscuit B3-1	9.53%
Biscuit B3-2 – Momo & EYO'O	32.00%
Biscuit B3-2 – Cracks	11.37%
Wafer FM B1	5.40%
Wafer FM B2	5.49%
Wafer HAAS B1	5.40%
Wafer HAAS B2	5.48%
Sponge Cake »Génoise«	5,72%
Administration	5,72%

TABLE 2: Breakdown of NPO by cost centers for biscuits producers

Because the production line B3-2 alone was responsible for 32% of losses as shown in table 10, the team chose this as the focus area. An in-depth follow-up on this production line showed several critical points in which materials were being lost mainly because of the equipment's inefficiency. The TEST Team generated several recommendations for improvement. These were implemented in the follow up TEST steps. Operational Performance Indicators (OPIs) were identified, and monitoring was also installed at the level of focus areas. After having enough data on performance of specific OPIs the baselines were established.

The implementation of good housekeeping measures alone is expected to save € 665,514 per year with a payback equal to 0.7 years. The overall investments made by the company have been estimated at € 1,842,282. These investments will lead to savings of around € 780,677 per year. The investments and good housekeeping measures will reduce the consumption of water by 812 m^3/year, of energy by 3,981 MWh/year, including the equivalent of 155 t/year of propane, and of raw materials by 233 t/year. The emissions of CO_2, BOD_5 and COD will be reduced by 1,933 t/year. These convincing results were based on the solid results of a well done analysis, starting with the identification of priority flows in step 1.4.