

STEP 1.8 CASE STUDY

Setting up an action plan for resource efficiency in a plastic recycling company



An Egyptian plastics recycling company decided to implement a TEST project with the aim of reducing its production costs using Resource Efficient and Cleaner Production techniques. At the project's start, the company was mainly focused on water and energy savings, since management knew that its consumption of these was above the industrial sector average. However, after the TEST "Priority Flow analysis" using the MFCA tool the TEST Team obtained an indication of the NPO costs and management realized that most of their losses came from a low yield in material processing. Because of this thorough analysis, the focus shifted to reducing losses of raw materials.

Once the savings catalogue was finalized, the TEST Team and its consultants organized a meeting with the company's Board of Managers to present the result of the analysis and a draft of the action plan to implement their recommended measures. The board of managers quickly approved the implementation of easy-to-implement, no/low cost measures, which included changing the size of the mesh in the sieve screens to reduce the possibility of rejecting properly sized flakes, shifting the supply of raw material to a higher grade, and reducing the percentage of rejected material.

One of the suggested measures consisted in reducing the operating temperature of the polymerization stage. The TEST Team estimated that the savings from this would be consistent. The management decided to further analyze this option by consulting with the technology supplier to jointly verify whether a lower temperature could affect the polymerization process or not.

Another measure addressed installing an automatic sorting machine to return the good bottles from the rejected stream back to the production. Whilst the company decided to accept the concept behind the measure, it decided to hire manual sorters instead of buying an automatic sorting machine that would entail high investment.

On the other hand, the company challenged the Team's recommendation to add a vacuum filter to the line processing the high grade raw material. Based on the consultants' analysis, the Team said that this measure would have reduced water consumption, whilst the board of managers believed that it would only enhance the quality in production. The Team argued that the filter would remove contaminants from the wash water. Thus, the cleaned water could be reused in the washing process, with a clear saving in water consumption. This measure was retained for further study.

Two measures listed in the savings catalogue were eventually discarded for technical reasons. The first discarded solution required the company to work with the suppliers of plastic waste bales, to receive better sorted material with lower percentages of reject materials such as cardboard and paper; unfortunately, the suppliers could not fulfil the request. The second discarded solution aimed at increasing the quality of sorting to reduce the quantity of recyclable flakes ending up in the rejects. This option could not be implemented due to the type the existing filters.

At the end of the meeting, the board of managers approved the action plan as illustrated in the table 1.

No	Objective	Title of the Action	Responsible ⁹	Budget (EUR)	Category	Target / indicator	Accepted	Discarded	Retained for study
1	Secondary raw material supply	Import better quality PET bottles bales from Europe	Procurement & Quality	0	No cost	To increase ratio of good quality PET bottles to 50%	x		
2	Optimization of PET washing line bottle pre-treatment	Check efficiency of de-labeler/labels separator	Production	100,000	Investment	Reduce the loss of material after bottle sorting by 1%	x		
3		Reset the bottle sorters and set up new process parameters	Production	5,000	Medium cost	Reduce the loss of input material by 0.7%	x		
4		Install an automatic third bottle sorting machine	Management, Operations & Technical office teams	80,000	Investment	Save 1% of the input material			x
5		Contact with bales supplier to eliminate cardboard sheet	Procurement	0	No cost	Eliminate cardboard waste			
6		Restart the vacuum filter when processing European bales of bottles	Maintenance	0	No cost	Reduce water consumption by 1 m ³ /ton product			x
7	Optimization of PET washing line flakes production	Adjust air flow of vertical air stream separator	Production	0	No cost	Reduce loss of good flakes from the air stream separator by 0.5%	x		
8		Check the size of the mesh of the sieve screen	Production	3,000	Medium cost	Reduce loss of good quality material from the sieving table by 0.5%	x		
9		Install a re-sort channel on the Sortex flakes sorter	Operations & Technical office teams	20,000	Medium cost	Reduce loss of good quality material from the sorter by 1%		x	
10		Improve the separation of oil from the process water	Technical office team	150,000	Investment	Water savings by 2.5m ³ /ton product Energy savings by 7%		x	
11	Adjusting the set points of the Solid State Polycondensation production line	Adjust the Polycondensation process temperature at recommended values. Combined with putting the vacuum pump of the degassing in function.	Maintenance	0	No cost		x		

TABLE 8: TEST Action Plan for a plastic company