

## ABSTRACT

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*Take care how you place your moccasins upon the earth, step with care, for the faces of the future generations are looking up from the earth waiting for their turn for life – Lyons, 1988*

Increasing levels of pollution and the increase in demand for water and other resources by industry led to a number of policies and regulations being developed and revised in South Africa. According to the Constitution of the Republic of South Africa (Act 108 of 1996), everyone has the right to an environment that is not harmful to health or wellbeing. In order to have the environment protected and sustained for future use, it became necessary to move away from the traditional fragmented approach to pollution and waste management and focus on an integrated strategy aimed at achieving a balance between ecological sustainability and socio-economic development.

In the Durban Metropolitan Area (DMA), the Durban Metropolitan Council (Metro) incorporated pollution prevention in their bylaws, which contained stringent discharge limits for heavy metal concentrations. This posed a potential problem for metal finishers who were concerned about complying with these discharge standards. In addition, the metal finishing industry was considered to be a significant contributor to the pollution load in the DMA, and therefore needed to find suitable solutions to dealing with environmental problems, especially waste management. Waste minimisation was believed to be a good tool for this industry to utilise in order to reduce its pollution load. It was seen from the literature and case studies from international initiatives that waste minimisation results in an improvement in process efficiency and reductions in production costs and environmental impacts, generally at minimal costs.

A waste minimisation club was initiated for the metal finishing industry in the DMA in June 1998. The club consisted of twenty-nine members of which the majority were small and medium sized companies. The club was run over a period of thirty months. A core group of sixteen companies actively participated in the activities of the club.

During the period of investigation, a total of 391 waste minimisation options were identified for club members and 147 of these options were implemented. This resulted in a total financial saving in excess of R 4 million for the duration of the club's existence. The saving represents combined savings in water, chemicals, metals, energy, effluent treatment, and waste disposal. Corresponding environmental benefits were achieved including a reduced demand for water, reduced toxicity of effluent from chemical and metal reduction, and a reduction in energy requirements.

Four companies were investigated in detail and presented as case studies. These companies showed that the payback on implementing waste minimisation options was mostly immediate. The size of the companies was not critical in determining the level of success from running waste minimisation programmes. Success depended mainly on commitment from companies and motivation of project champions.

It was found that the greatest barriers to implementing waste minimisation, as identified by companies, were a lack of time, resources, and commitment. Companies joined the club mainly for benefit of reducing costs and complying with legal standards.

Aside from successfully raising awareness and promoting the concept of waste minimisation, the waste minimisation club also resulted in an improvement in the relationship between the metal finishing industry and the Metro, and among club members.

Based on the results achieved by club members, and from managing the club, it was evident that the club was effective in promoting waste minimisation in industry. For the future running of clubs, it is recommended that waste minimisation assessment training be given to all employees of a company. It would also be more useful if companies reported savings on a more regular basis and more formally. In addition it is recommended that club membership should be limited to between ten and fifteen companies to facilitate improved management of the club.