# ENVIRONMENTAL BENCHMARKING FOR IPC INDUSTRIES

## SYNTHESIS REPORT

Prepared for the Environmental Protection Agency
by
Clean Technology Centre, Cork Institute of Technology

**Authors:**

**Noel Duffy, Colman M$^{c}$ Carthy and Matthias Zoehrer**

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**ENVIRONMENTAL PROTECTION AGENCY**
An Ghníomhaireacht um Chaomhnú Comhshaoil
PO Box 3000, Johnstown Castle, Co.Wexford, Ireland

Telephone: +353-53-60600 Fax: +353-53-60699
Email: info@epa.ie Website: www.epa.ie

# 1 Introduction

The introduction of Integrated Pollution Control Licensing (IPCL) of industry has resulted in the generation of significant amounts of environmentally related data within companies. Much of this must be publicly reported to the EPA where it may be used for compliance monitoring. The data also provides an opportunity for companies to identify and quantify their significant environmental aspects, thereby contributing to better management. This improved management can bring environmental and economic benefits. A potential use of the data is to assess performance trends internally within the company, and to allow the sharing of key performance indicators between companies. Both of these activities facilitate continuous improvement through a process of benchmarking.

This project had the goal of developing the specification for a software tool that could facilitate a process of benchmarking and internal development of an environmental management system among licensees, in addition to assisting electronic reporting, taking into account the needs of companies and the EPA, the scope for performance indicators and the reporting obligations.

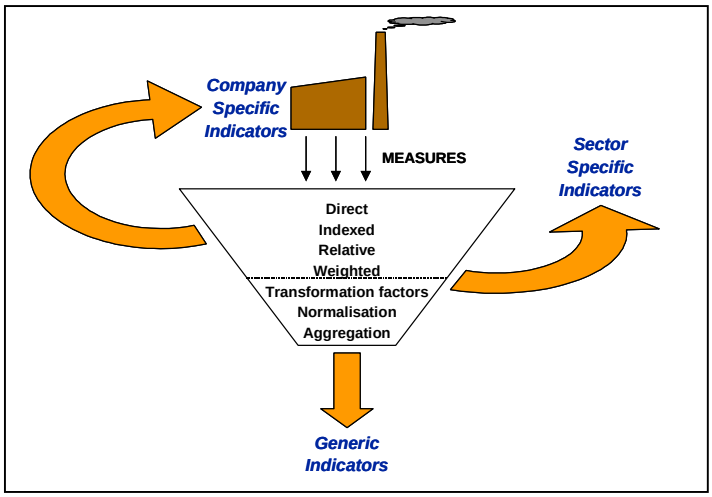
The project has been undertaken by the Clean Technology Centre, with the assistance of EMISoft A/S (Norway) and Valor & Tinge (Denmark). EMISoft provided support in relation to the software, and Valor & Tinge provided support in relation to the international applicability of environmental performance indicators.

Detailed reviews of published literature and current Irish industrial practice have been undertaken to assess the potential and desired scope for such a tool. Particular consideration has been given to the international development of environmental performance indicators, e.g. ISO 14031/2 and corporate environmental reporting initiatives, e.g. WBCSD, GRI and their relevance to benchmarking sectors and companies licensed in Ireland. Existing IPC licences, EMP reports, existing emissions self-monitoring reporting requirements, EPA monitoring regimes and the EPA Annual Environmental Report (AER) Guidelines were examined to develop a specification of EPA needs and wants. Available environmental management software was identified and its applicability examined. A survey of IPC licensees was carried out to establish a baseline on use of indicators, benchmarking, EMS and electronic reporting. A total of 186 responses were received, being 35% of the licensees at the time of the survey.

# 2 Findings

While sustainable development is accepted as requiring consideration of three dimensions: social, economic and environmental, most of the relevant literature and current industrial practice relates to examining economic and environmental performance. The International Standards Organisation (ISO) developed three categories of indicator, one for making operational decisions, a second for assessing the condition of the local, regional, national, or global environment, and the third for making management decisions. These three categories of Operational Performance Indicators (OPIs), Environmental Condition Indicators (ECIs), and Management Performance Indicators (MPIs) can be seen as a pressure-state-response model of business's impact on the environment – 'the *operations* of business impose *pressure* on the environment, which affect its *state* or *condition*, leading to a *response* through action by *management* to address the problem'.

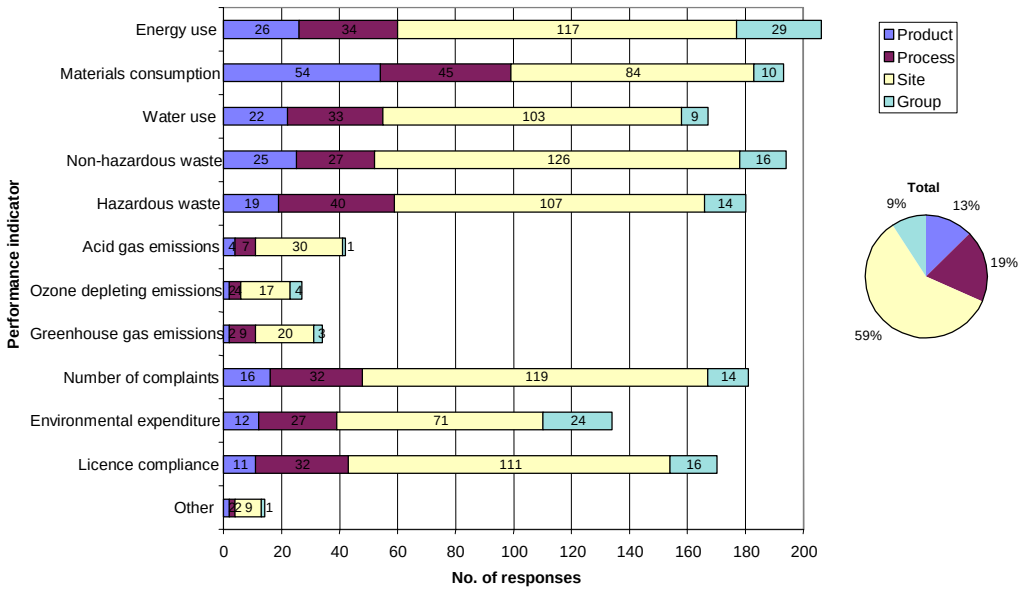
Data representing inputs: consumption of material and energy, or outputs: product / service and wastes / emissions may be reported as absolute values or transformed relative to other parameters such as time, impact or other inputs or outputs, leading to a wide range of environmental performance indicators. As the data is further refined, it is increasingly macroscopic in view and less useful for direct management.




In addition to ISO, organisations such as the World Business Council for Sustainable Development and the Global Reporting Initiative are tending to recognise a set of universal indicators. When the environmental parameters are combined with financial parameters: added-value or sales, eco-efficiency indicators are derived:

$$Eco-efficiency\ indicator = \frac{environmental\ \ performance\ indicator}{financial\ \ performance\ indicator}$$

Reviewing the results of the survey of Irish IPC licensees, it was found that the vast majority of licensees use environmental indicators and that the average number of




indicators used is six. These are generally the result of specification in the IPC licence and are used at a site-wide level, rather than process or product specific, and are not normalised for production. Many of the respondents interpreted "benchmarking" as an internal reflection process, without reference to other sites or companies. A small number of companies are or have engaged in structured

benchmarking. Hence one may conclude that the existing level of indicator use and benchmarking practice is relatively modest among licensees. This leads to a set of recommendations that may be considered "cautious".

# 3 Recommendations

There is merit in developing software to facilitate the mandatory reporting of data. This should be based on the model of a site tool for preparation of data to be subsequently uploaded to the EPA central system, to ensure licensee confidence in security, at the expense of more difficult software maintenance. The software should be relatively simple, to encourage rapid acceptance by licensees. Along with templates for environmental records and reporting an environmental management programme (EMP), there should be a scheduling tool and report generator. There is no benefit in developing extensive environmental management system support software. There are numerous commercial products available, yet the majority of licensees have installed or are maintaining a system without recourse to such software. A detailed software specification is provided. The cost of developing a prototype site-tool, from scratch, is estimated at 3115 hours, equivalent to €185,000, assuming certain software and hardware pre-conditions at the test site. Adaptation of an existing commercial system is likely to be less expensive and involve less risk. A more detailed estimate and specification of the software could be achieved at a cost of approximately €20,000.

A few generic Performance Indicators should be used across IPC industries:

| Operational | Management |
|---|---|
| ▪ Global warming contribution<br>▪ Contribution to ozone depletion<br>▪ Contribution to acidification<br>▪ Non-renewable primary energy input<br>▪ Total water use<br>▪ Total waste disposed of<br>The latter two indicators may be sub-categorised by water source and by waste classification. | ▪ Number of complaints on a particular aspect<br>▪ Percentage compliance with licence.<br>▪ Percentage of preventive projects to overall number of projects in the Environmental Management Programme (EMP).<br>▪ Number of EMP targets reached. |

In view of the existing level of indicator usage, these should be introduced on a site-wide basis rather than by process or product, though process or product-specific values are more useful for management. Licensees should be encouraged to combine these with economic values (added-value or sales) to derive eco-efficiencies. The existence of ISO 14031 should be promoted to licensees, to encourage them to determine other Management Performance Indicators relevant to their operations and to emphasise performance as well as conformance in their environmental management systems. If the use of indicators becomes more popular, and licensees demonstrate a willingness to share performance data, consideration should be given to introducing a benchmarking system based on experience with quality systems, e.g. a variant on New Mexico's Baldridge-based "Green Zia" categorisation system.