

Ecomapping

A visual, simple and practical tool to analyse and manage the environmental performance SMEs and micro-enterprises

- ➔ An easy, creative and systematic method of obtaining environmental data
- ➔ An awareness-raising and learning tool based on the physical reality of your company
- ➔ A practical communication tool, accessible to all employees
- ➔ A free do-it-yourself management tool for EMAS and ISO 14001 in a visual format
- ➔ A dynamic inventory of the changes in the environmental behaviour of your company

«One little picture says more than a long speech!»

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SMEs, micro-enterprises and environmental management tools

Environmental management poses specific problems for SMEs and micro-enterprises

Several millions of Small and Medium-sized Enterprises (SMEs) and micro-enterprises have concrete problems managing the environmental impact of their activities.

They do not have the necessary tools and resources.

The greatest problem is however one of awareness and behavioural change.

Markets are taking environmental issues into account and are demanding EMAS and ISO 14001

Soon even the smallest companies will have to show customers, public administrations, non governmental organisations, insurance companies, neighbours and professional associations, that they have implemented environmental management.

Tools exist but they are often over-complicated

The range of tools to help SMEs is constantly growing but a lot of these tools are considered to be too heavy and complicated by smaller companies and micro-enterprises. They are seen to represent a growing threat of bureaucratisation. To conform with or to use environmental management standards which are becoming prevalent throughout Europe at the moment, such as ISO 14001, or the EMAS regulation scares small companies.

Visual, simple and practical tools are needed

Small structures function by adjusting as need demands and on the basis of an oral culture. The greatly varying and sometimes low levels of training within such structures and the existence of a visual culture with little emphasis on documentation must be taken into consideration. There is a need for appropriate tools and support. If you bring together and question employees of a site, a shop floor, a workshop, etc. and ask for and use their knowledge, intuition and experience, they can give you an immediate picture of the environmental management within your company.

The results of a quick and visual environmental review can be the equivalent of expensive scientific studies conducted by consultants. Ecomaps, which do not cost anything, are the Polaroid photograph of your environmental management - a scientific study provides the high-resolution image. Both will enable you to take positive action.

The road map does not make up the whole country!

Ecomapping is a visual and easy-to-use tool which enables employees to get involved in environmental management. It is a road map of a site, a shop floor, a workshop, etc., which can lead to improved environmental management and which can provide a solid basis for a more formal environmental management system according to ISO or EMAS.

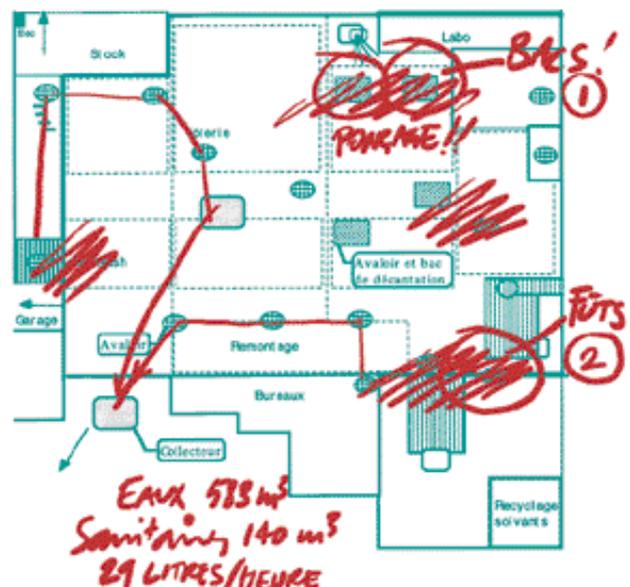
What is ecomapping?

Ecomapping is an original and simple tool that helps small companies when implementing environmental management

- an inventory of practices and problems
- a systematic method of conducting an on-site environmental review
- a collection of information which shows the current situation using pictures
- a working and awareness-raising tool
- a do-it-yourself tool for SMEs
- a tool which allows employees' involvement and participation

Ecomapping is environmental management «light»

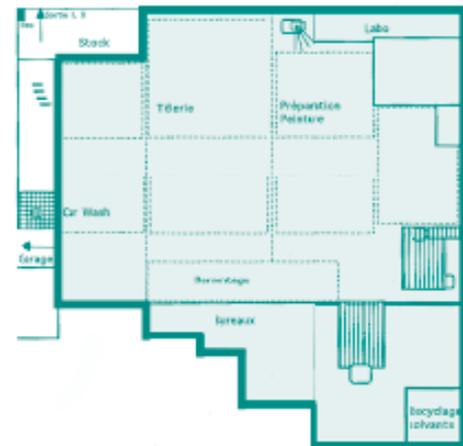
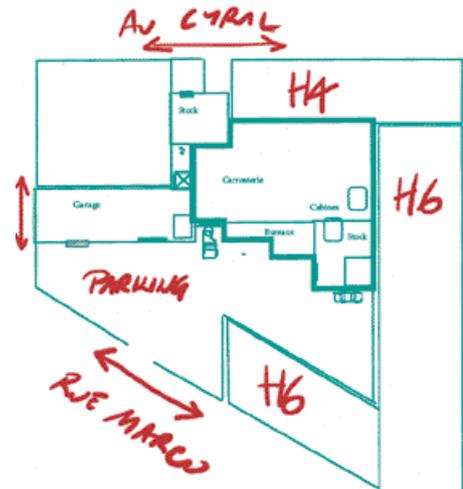
- a practical method for conducting an environmental review
- a support for training and communication
- the basis of environmental documentation for your company
- which helps in learning about and collecting data
- a method which allows your company to define and prioritise problems
- everyone in your company can use it as a support for their work and training
- everyone in your company can participate without having written procedures and instructions
- useful for all stakeholders



The development of ecomaps on water, soil, air, waste management, etc. is not a goal in itself. The main interest lies in the fact that it is a process which accompanies a review of environmental performance, and in the positive actions which result.

How to use ecomaps

- Indispensable materials
A4-sized paper and a photocoppy machine
- Time needed
Less than one hour of work for each map
- When to do it?
After the end of the accounting year
- How often should they be updated?
Once a year, or if you renovate the site, or extend your activities, etc.
- Filing
With documentation for your environmental management system, with your annual accounts
- Who can use them?
The maps can be used by many different types of companies: from small manufacturing and service companies to large structures and local authorities



How to draw your ecomaps?

1• Map of the urban situation

Make a map of the site, seen from above, including car parks, access areas, roads and the surrounding environment. It should show the real situation.(2 copies)

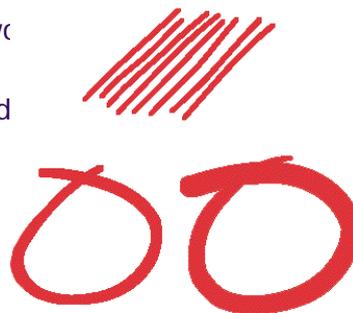
2• Map of the site

Draw the outline of the site using a scale and showing the interior spaces. This map should be copied (6 times) and will be the basis for the work to be done. The maps should show the real situation - they should be simple, recognisable and in proportion. They should have a date, a name and a reference. You will have to integrate one or two significant objects which will enable you to orient yourself straight away in the site (e.g. machines, boilers, etc.). If your site covers very different areas, you can do a map of each area and then bring them altogether.

3• Symbols

Develop your own symbols, but use at least two

- Hatched lines: small problem
(area to be monitored, problem to be studied)
 - Circle: large problem
(Stop, corrective action)
- The more serious the problem, the thicker the circle.



In order to improve the quality of your ecomaps, you can use standardised pictograms.

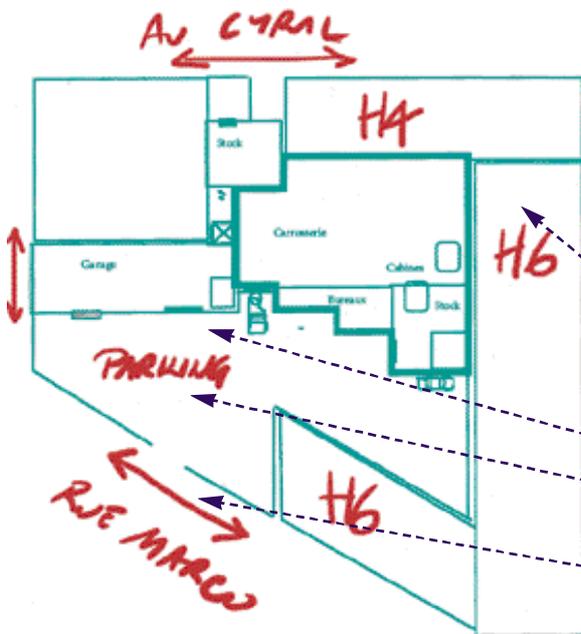
Environmental mini audit

Before you begin to draw up your ecomaps, do a mini audit in a few minutes with all the members of your staff. Ask them to give quick and intuitive responses: one cross per question. The correspondence between the results of this quick survey and those of more detailed work done with your ecomaps will surprise you.

120 seconds to audit the environmental management of your company				
Use of raw materials				
Use and choice of energy				
Use of water and wastewater				
Prevention and reduction of waste				
Recycling and selective separation of waste				
Air pollution, dust and odours				
Storage of products				
Reduction and control of noise and vibrations				
Health and safety in the workplace				
Mobility and transport of employees and goods				
Prevention of environmental accidents				
Environmental information (internal and external)				
Communication with suppliers and sub-contractors				
Green planning for goods and services				
Neighbourhood				
Motivation of managers				
Motivation of employees				
Administrative situation				
OVERALL SITUATION (TOTAL)				

1. Ecomap: urban situation

This map situates your site in its urban context



- What are the areas of interaction between your site and its neighbours?
- What is the authorised use of the area covered (i.e. commercial, industrial, etc.)?
- What vehicle traffic is generated by your activities?
- What is the situation of your company in the neighbourhood?
- Indicate the number of floors above ground (not including roofs) of the buildings around the company within a radius of 50 metres.
- Use of land (car park or building)
- Entrance and main points of access to the company
- Direction of traffic

Croissants and traffic

The most important direct environmental impact of a small company is often related to the traffic it generates. For example, a small bakery in the city centre generates more than 350'000 movements of cars per year!

Do you want to calculate?

Count the number of vehicles in relation to your activities and estimate their number of movements within a radius of 1 km. The table below will help you to calculate the pollution generated.

Emissions gr per km	Light vehicles, petrol	Light vehicles, diesel	Heavy vehicles, diesel
CO ₂ (Carbon dioxide)	250	133	837
NO _x (Nitrogen oxide)	2,53	0,55	19,2
CO (Carbon monoxide)	11,26	0,85	3,34

• draw

- usage of neighbouring areas (residential, green areas, industrial)
- roads and direction of traffic
- consider importance of different types of traffic and size of roads

• document

- cadastral survey
- other administrative surveys of the area
- recent permits for activity in question

• estimate

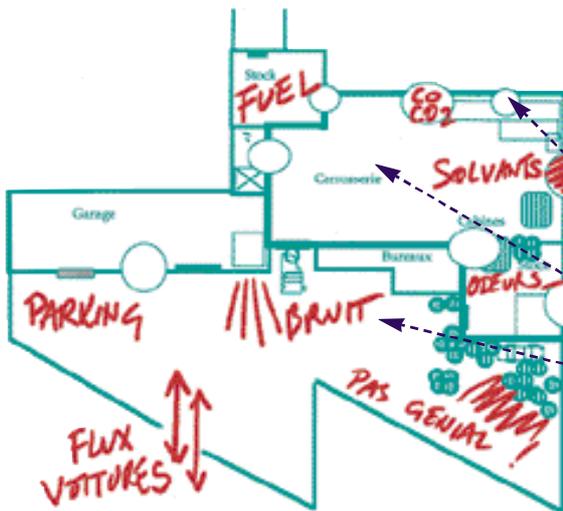
- your fleet of vehicles (cars, trucks, etc.)
- parking areas available and used
- incoming and outgoing movements (suppliers, binmen, employees' and customers' cars, etc.)

• calculate

- surface
- date of establishment
- number of employees
- age of buildings
- number of vehicle movements per unit of product/service

2. Ecomap: nuisances

This ecomap is the first step in your work plan



It consists of a brief overview of the entire situation of the site through discussions and the results of the environmental mini audit. It should be completed with an input-output analysis of the material and energy flows in your company in physical terms (kg, kWh, m³, etc.)

- Chimneys and vents
- Containers and bins
- Areas of important activity
- Noise
- Areas of problem with neighbours

If you identify a problem of particular importance (such as noise), you should develop an ecomap especially for this problem.

All employees should be involved in this initial summary environmental review. Following this, prepare a complete assessment of material and energy flows using data available from your company's accounting records. You should relate the figures to your activities and develop your own indicators.

Consumption assessment	
Input	Output
• raw materials	• solid and liquid waste
• energy	• air pollutants
• water	• nuisances, noise, odours
• transport	• authorised use of land
• packaging	

Examples

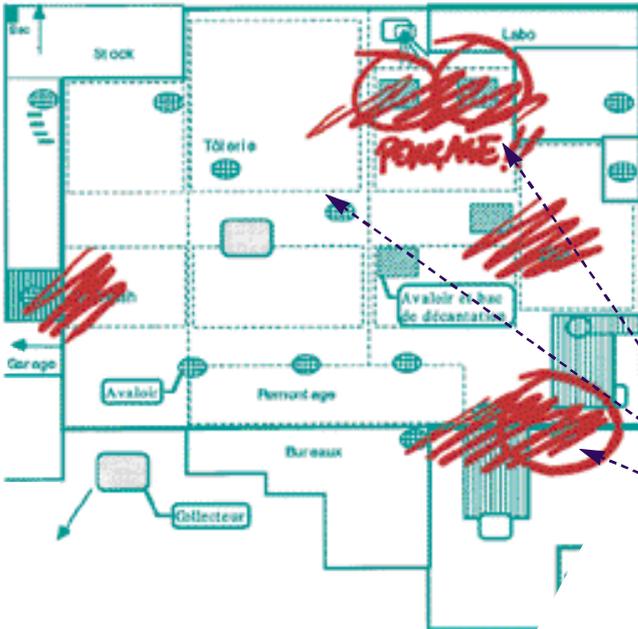
- **energy:** x litres of heating oil/year/m² of work area
- **resources:** x litres of water/kg of product
- **waste:** x kg of waste generated per unit of production or service

Comparison of indicators over the period of a year shows how your company is evolving.

• draw	• document	• estimate	• calculate
<ul style="list-style-type: none"> • points of discharge into air • sources of noise and odours • areas of storage of waste and hazardous products 	<ul style="list-style-type: none"> • tax declaration • complaints from neighbours: letters, statements, legal proceedings • certificates of machine maintenance • financial information 	<ul style="list-style-type: none"> • first intuitive evaluation of your site • analysis of flows • material assessment • environmental performance 	<ul style="list-style-type: none"> • duration of permits (years) • taxes paid • taxes, charges, insurance • consumption • environmental costs

3. Ecomap: water

This ecomap looks at your consumption of water and discharge of wastewater



- Where is there a high level of water consumption?
- Where are hazardous products poured into the sewer?
- Possibilities for product substitution
- Possible accidents
- Wastage and bad habits
- Areas of cost-savings
- Drains
- Areas of bad practice
- Piping system
- STOP! Unallowable (oil in sewer)

One drop of water takes five years to go from a cloud to your tap



- Check for leaks
- Measure your consumption!
- Save water!

Water is a resource which must be protected and must not be wasted.

One person consumes on average 70 litres of water a day. How much does your company consume per year in comparison with a normal person? Which areas of activities are dangerous in terms of water pollution, e.g. cabin for painting or paint stripping? Check to see where all drains are situated. Do not forget that one drop of petrol product contaminates more than 5'000 litres of water.

• draw

- areas where liquids are poured
- piping and drainage system
- treatment methods
- major areas of consumption (washing machines, etc.)

• document

- annual water bills
- permits for discharge of wastewater and taxes
- plan of sewage system
- if treatment methods are used, technical description from supplier

• estimate

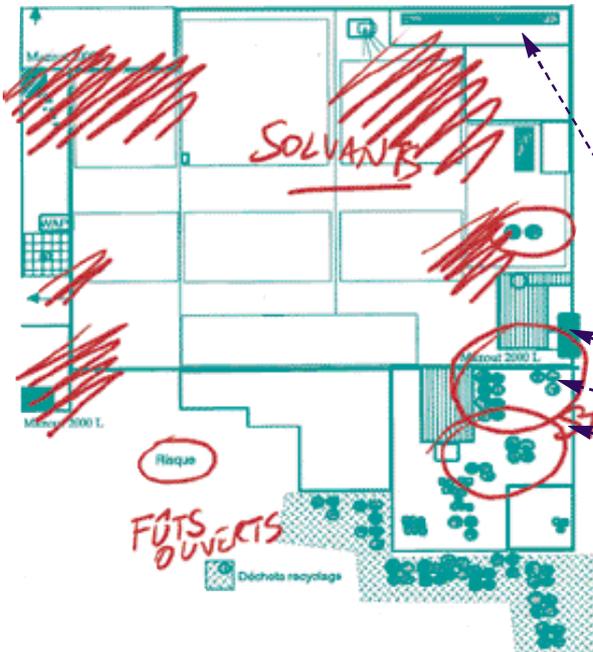
- wastage
- activities which require water
- water charges
- pollutants
- bad practices
- impact of pollutants

• calculate

- consumption
- major sources of consumption
- annual consumption of cleaning products
- other products
- measurements of discharges

4. Ecomap: soil

This ecomap looks at the storage of flammable, dangerous or hazardous products in relation to groundwater



- Is there a threat to groundwater in the case of accidents?
- Where are your old water tanks?
- Soil pollution?
- Procedures in the case of accidents?
- Do storage areas have concrete floors, are they partitioned off, are they ventilated?

- Storage areas
- Water tanks
- Vats and bins
- Areas of risk

1 litre of fuel which infiltrates the soil can contaminate 1'000 m³ of groundwater.

For this reason, it is very important to know the history of your site, the positioning of old water tanks, etc. Polluted soil will lower the value of your site. In certain European countries, when companies and the land upon which they are situated are being sold, lawyers require an attestation regarding soil quality. If the soil is polluted, it has to be decontaminated (costs at the moment average 125 Euro (\$138) per m²).

- Store your dangerous products in good conditions!
- Do you know what to do in case of accidental spillage?

• draw

- storage areas
- water tanks
- "suspicious" vats, containers, pallets

• document

- safety labels on products
- analysis of basement
- layout of water tanks
- areas of water collection

• estimate

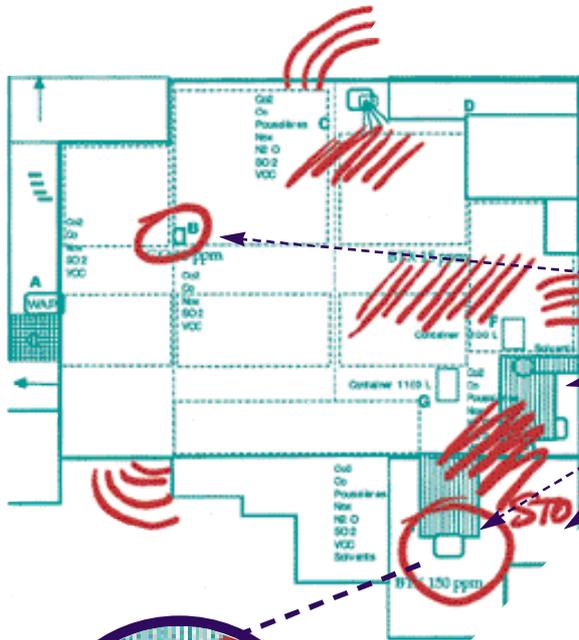
- old water tanks
- impermeability of soil
- type of products
- storage in tanks and vats
- leakage

• calculate

- watertight surface
- permanent stock in litres
- calculation of flows

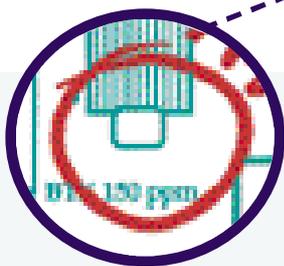
5. Ecomap: air, odours, noise, dust

This ecomap looks at all the points of emissions and the functioning of machinery



- What is the air quality inside your company?
- Do you pay attention to sources of noise?
- Are filters replaced regularly?
- When was maintenance work last carried out on your boiler?

- Chimneys
- Extractors
- Noise
- Volatile products
- Areas of bad practice



If your company is located in an urban area you should pay particular attention to the problem of noise. Do a test. If at the edge of the site you can no longer have a conversation without raising your voice, you have exceeded 65 decibels (dB).

Atmospheric emissions are mainly due to heating installations and generators.

Do you want to calculate?

	Natural gas (g/m ³)	Heating oil (g/litre)
Greenhouse effect - CO ₂	1879	3136,5
Photosmog - NO _x	3,01	3,35
Acid rain - SO ₂	0,027	3,6

Do a total calculation of CO₂ by multiplying by 5 the total calculated for your urban map situation. Make a comparison: a person living in a developing country generates 1,8 tonnes of CO₂ per year.

• draw

- openings in roofs and ventilators
- main points of emissions

• document

- certificates of maintenance
- technical instructions
- product safety instructions
- authorisations

• estimate

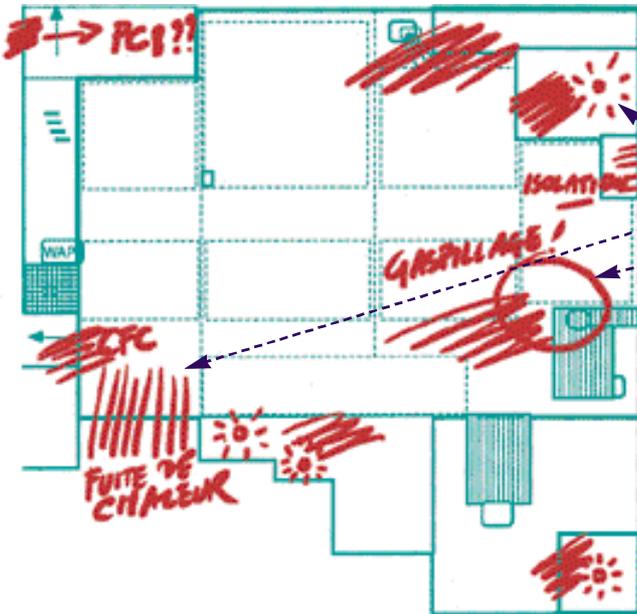
- work procedures
- product quality
- state of filters and pipes
- disturbing odours

• calculate

- volume of volatile pollutants
- regularity of maintenance
- norms
- noise levels

6. Ecomap: energy

This ecomap looks at your consumption of energy and its impact



- Where are areas of wastage?
- Compliant electrical installations
- Where do heat losses occur?
- Aggressive lighting
- Loss of energy
- Oversized machinery

Do you want to calculate?

Convert your energy consumption into kWh

Resources consumed	Energy generated (kWh)
• Fuel: 1 litre (36 MJ)	10
• Gaz: 1 m ³ (40,6 MJ)	11,28
• Propane: 1 tonne (46,4 GJ)	12'880
• Coal: 1 tonne (30,6 GJ)	8'500
• Wood (broad-leafed tree): 1 stère (5,6 MJ)	1,56

Visualise the equivalent quantity of resources necessary to generate this energy

Resources necessary to generate 1'000 kWh	
• Brown coal	1'300 kg
• High energy-value waste	1'500 kg
• Low energy-value waste	3'500 kg
• Heavy fuel	220 l
• Solar panels	12'500 m ²
• Uranium	0,022 gr
• Natural gas	270 m ³
• Water (dam of 10 m height)	43'200 m ³
• Anthracite coal	320 kg

• draw

- location of machinery
- useless lighting
- areas of heat loss

• document

- maintenance certificates
- bills
- technical instructions for machinery

• estimate

- type and use of energy
- insulation
- reactive electricity

• calculate

- consumption kWh
- energy efficiency

7. Ecomap: waste

This ecomap looks at management and prevention of waste

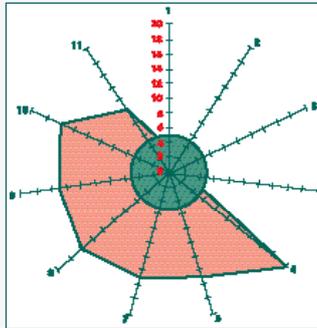


- Aggressive lighting
- What is the level of recycling?
- What preventative measures have been taken?
- Are your suppliers obliged to take back materials?
- Bins
- Direction of disposal
- Mix of household/non-hazardous waste and toxic/hazardous waste
- Areas of bad practice
- Containers

Do you want to calculate?

- 1 to 5: more or less good management
- 6 to 10: no management
- 11 to 15: lack of management is the source of problems
- 16 to 20: lack of management is the source of serious problems

Scoring from 0 to 20 takes different criteria into account: dangerousness of products, potential of finding alternative solutions (recycling and others), etc. Fill your figures into a table. Make a radiograph and the areas of poor or no management will be visualised immediately! (Put this up in the area of work in your company for everyone to see!). See the example given.



Evaluate the level of waste management, score your performance.

Example

1. Paper and cardboard for packaging	3
2. Tyres	1
3. Non-metallic car body parts	5
4. Batteries	2
5. Waste from recycling	20
6. Empty oil filters	15
7. Aerosols	15
8. Packaging chemical products	16
9. Empty paintings	15
10. Cabin filters	16
11. Scrap	10

You are in the green? It is fine!

• draw

- bins and containers
- direction of waste flows
- areas of bad practice

• document

- certificate from transporters
- annual bills
- assessment and evolution of flows

• estimate

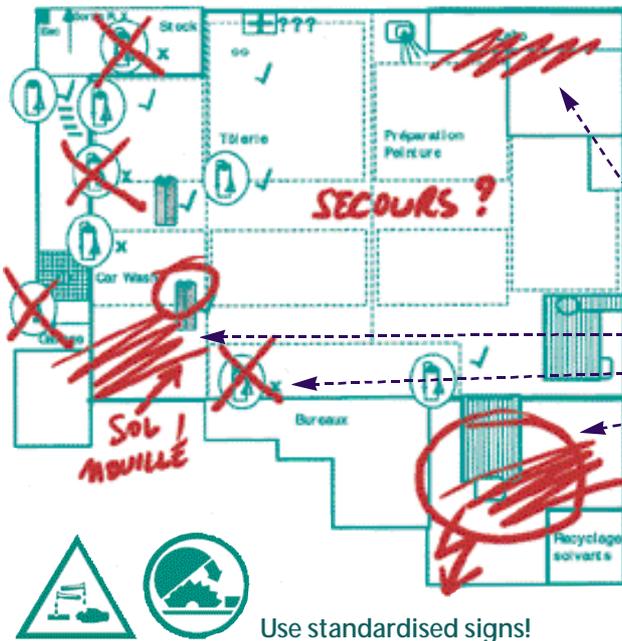
- type of wastes
- level of recycling
- prevention measures
- categories of waste

• calculate

- tonnes of waste disposed per year
- taxes paid on waste
- level of recycling

8. Ecomap: risks

This ecomap identifies risks of accidents and pollution



- Accessible and clearly identified emergency exits?
- Known emergency procedures?
- Dangerous situations?
- Where do you use products which are carcinogenic, cause allergic reactions, etc.?

- Accidental spillage
- Problems with falls
- Non compliance
- Solvent clouds and risk of explosion



Risks related to health, e.g. inhalation and absorption of dangerous products or accidents which cause bodily harm



Risks related to the environment, e.g. leakage of products, accidental spillage and usage of toxic products



Risks related to fire, e.g. explosions and dispersion of toxic products



You must be prepared and know emergency procedures and telephone numbers

• draw

- location of extinguishers
- emergency exits
- areas of risk

• document

- toxicology sheets
- emergency procedures
- authorisations
- fire services
- accident reports

• estimate

- state of machinery
- emergency facilities
- state of ground

• calculate

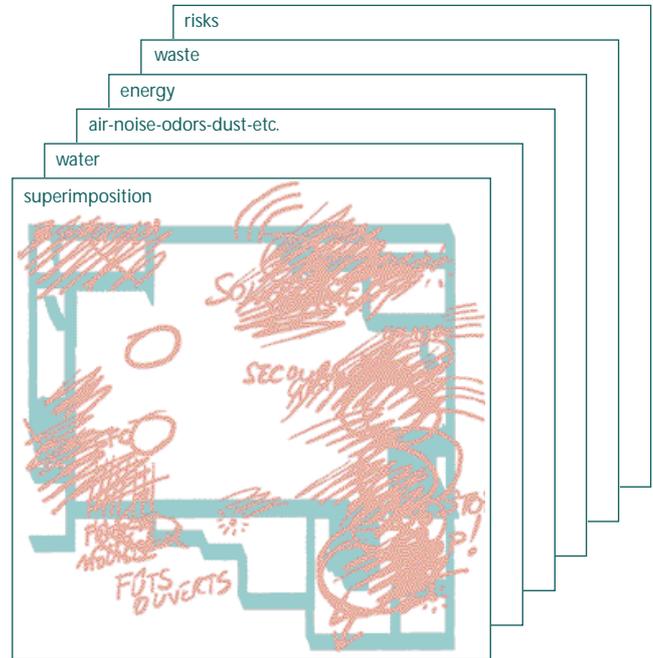
- number of accidents
- hours of training for employees
- % of dangerous and toxic products in stock

Work programme

If you put your ecomaps one on top of the other (using overhead transparencies), environmental priorities will become clear straight away

 Rank your problems in terms of seriousness. First deal with problems surrounded by a thick circle. Priority should be given to problems which link workers' health and safety and the environment.

 Then think about the areas of risks and develop solutions. This approach should be repeated once a year.



Measure your progress and develop your own indicators of environmental performance

Quantity of waste (kg per ⌘)

Energy consumption (kWh per ⌘)

Emissions CO₂, NO_x, SO₂, etc. (kg per ⌘)

Packaging (kg per ⌘)

Transport (km per ⌘)

Money spent on the environment (Euro, \$, etc. per ⌘)

Environmental actions undertaken (hours per ⌘)

Accidents per year (number per ⌘)

Training of employees (hours/year per ⌘)

etc.

(⌘ is the unit of product or service)

The environmental binder

I. Data on the company

General data

- Identity card of the company (address, statutes, permits, administrators, etc.)
- Historical development (date of creation, business, etc.)

Company operations

- Organisation chart
- Production processes
- Products and services
- Calculation of material and energy flows in physical terms
- Environmental costs (investment, taxes, charges, insurance, fines)

II. Urban situation

- Company's maps (architect and urban situation)
- Environmental quality of the surroundings (proximity of parks, rivers, industries, dwellings)
- Relationship with third parties (communal and regional authorities, neighbourhood)
- Environmental thematic ecomaps

III. Water and wastewater

- Water consumption
- Quantity and quality of wastewater
- Treatment of wastewater
- Sewage system
- Wastewater management

IV. Soil and groundwater

- Storage of chemical products
- Type of ground under the site and location in relation to drainage and collection of water
- Risks in storage
- Soil analysis

V. Air, noise and vibrations

- Sources of noise and measurements
- Site and edge of site
- Points of emissions
- Gaseous emissions and odours
- Reduction of emissions

VI. Energy

- Points of energetic consumption
- Areas of heat loss
- Reduction of energetic consumption

VII. Waste

- Origin of waste
- Storage of waste
- Elimination of waste
- Waste management

VIII. Emergency facilities and risks

- Emergency facilities and procedures
- Maps of storage of dangerous and flammable products
- Emergency addresses (firemen, ambulances, etc.)

IX. Your environmental action plan

Some experiences with ecomapping

Olivier Héaulme

Neuville-St-Vaast - France SME

- + Allows you to easily visualise the origins of environmental impacts
- + Facilitates dialogue between employees & management
- + Saves time
- + Very easy and quick to use
- Perceived as not being serious enough, i.e. too childish and too innovative, by one representative of a company management

Céline Paolacci

Nogent-sur-Marne - France Hospital

- + Allows you to visualise the situation of a site following one good look
- + Allows you to visualise changes in parameters and to propose and check objectives
- Does not allow you to determine risks but rather to determine the physical reality of the site
- Not so easy to use in a site which covers a large area

Fernand Antonioli

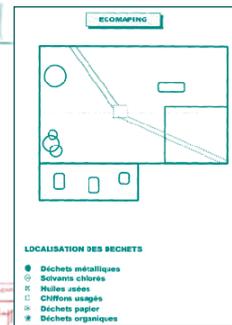
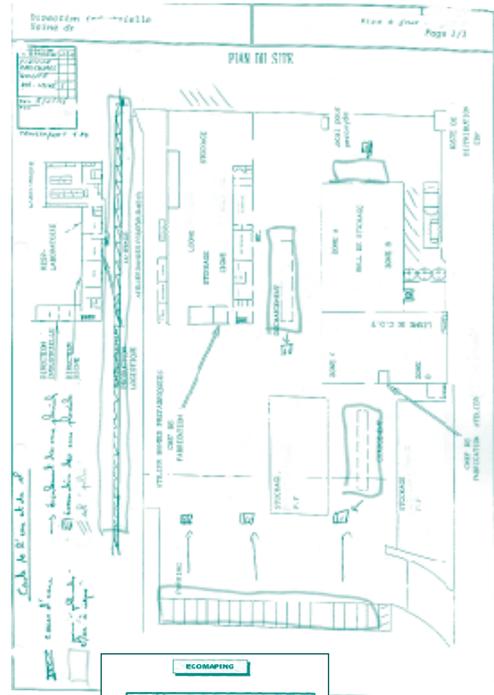
Liège - Belgique Trade Union representative
Solidarnosc – Stalowa Vola

- + Particularly interesting for workers on the shop floor
- + Can easily be used by a union delegation without the help of external experts
- + Can benefit from the experience of employees in the area of health and safety

Marie-Christine de Wolf

Biffa (Seven Trent)
Braine-l'Alleud – Belgium Landfill

- + Allows involvement of employees working at all levels in the company
- + Visualises the seriousness and the geographical importance of the impact
- + Simple material for training employees
- + The ecomaps can be superimposed, not the texts



Ecomapping and EMAS

Initial review	😊😊😊
Environmental policy	😊
Legal compliance	😊
Environmental programme	😊😊
Management system	😊
Documentation	😊😊
Audit	😊😊😊
Employees' involvement	😊😊😊
Communication	😊😊😊

Ecomapping and ISO 14001

Environmental policy	😊
Environmental aspects	😊😊😊
Legal requirements	😊
Objectives and targets	😊😊
Programme for environmental management	😊😊
Structure and responsibility	😊
Training, awareness-raising and competence	😊😊😊
Communication	😊😊😊
Documentation of the Environmental Management System (EMS)	😊😊
Control of documentation	😊😊
Operational control	😊😊
Prevention of emergencies	😊
Monitoring and measurement	😊
Non compliance, corrective and preventive actions	😊
Records	😊
Audit of the EMS	😊😊
Management review	😊😊
Employees' involvement	😊😊😊

For further information

The ecomapping tool was developed by Heinz-Werner Engel and used by **ABECE** (Association Belge des Eco-Conseillers en Environnement) and the **Eco-Council Institute (Belgium)** in several European countries in the framework of the ADAPT programme.

This tool is available in several languages. It has been translated, promoted and broadcast in Arabic, English, French, and Turkish to the South and East Mediterranean countries by **Sustainable Business Associates (SBA)** through the **DELTA Programme**.

Application of this tool is highly recommended to accompany **SMEs** to set up an Environmental Management System (EMS).

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An international network of ecomapping users has been created: <http://www.ecomapping.org>

WHO IS SBA ?

SBA, Sustainable Business Associates, is an international non-governmental organisation (NGO) that is working to engage industrialists in 'eco-efficiency' with the aim of minimising environmental impact and improving business productivity. To pursue this aim, SBA has initiated the DELTA Programme to sensitise industrialists to new business risks and opportunities, and to provide them with the management tools and training to move towards sustainable development.

WHAT IS DELTA?

DELTA stands for **Developing Environmental Leadership Towards Action**. Chapter 30 of Agenda 21 (an outcome of the 1992 United Nations 'Earth Summit') indicates that business & industry have a critical role to play in achieving sustainable development goals. After an initial awareness-raising phase, the DELTA Programme focused on structuring industrialists into 'Business & Environment' networks (DELTA Networks) in 11 countries of the Mashrek & Maghreb. These Networks are composed of key industrialists interested in taking a proactive, leadership role on environmental issues. The DELTA Networks are practical, working structures for industrialists to obtain information & contacts, exchange experiences, develop environmental know-how, and gain access to practical management tools that can offer 'win-win' options based on eco-efficiency.

WHERE ARE THE DELTA NETWORKS?

DELTA Networks are operating in Algeria, Egypt, Jordan, Lebanon, Libya, Mauritania, Morocco, Palestine, Syria, Tunisia and Turkey.

FOR FURTHER INFORMATION

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