

Before beginning this course please complete
[this assessment of competence](#)

Welcome to the course!

During this course we will talk about global environmental issues. We will also introduce you to ways you can protect the environment at work.

The course will take around 4 hours to complete in total. However, the course has been split into modules which can be completed at your own pace and a time to suit you.

This course was developed with funding from the European Commission Leonardo Da'Vinci Lifelong Learning Programme.



Whenever you see this icon there will be a link to extra information. Click it if you want to know more about the topic.

Click a module below to begin.

Please allow time for the module to load after you click it.
On slower connections it may take a minute or two to appear.

Module 1 - Global Environmental Issues

Module 2 – Business and the Environment

Module 3 – Business Benefits of Environmental Improvement

Module 4 - Control measures and environmental innovation

Please complete the questionnaire below once you have finished all modules

Evaluation Questionnaire

Disclaimer

- Following this good practice guidance doesn't remove your responsibility to comply with the law and prevent pollution from your activities.
- Causing or allowing pollution is a criminal offence; compliance with this or any guidance isn't a defence.
- You should make sure that you are working in line with current legislation.

Module 1 - Global Environmental Issues

News Headlines:

- **Unite on climate or sink together**
- **Warmest winter on record**
- **50% of Amazon could be gone in 20 years**
- **End of oil!**

What have you heard about the environment?

During this module, we'll talk about the main global environmental issues we face as a society.

The Environment

- We depend on the land, air, water, plants and animals for our survival and quality of life. Yet our activities, the materials we use and the products we provide can harm the environment.
- By making choices at work and in our personal lives we can play a vital role in avoiding damage to the environment.

Definition of the environment

How would you describe the environment?

Type your answer in the box below...

You said:

The environment is defined in many different ways:

Einstein was said to define the environment as “everything that isn't me”.

When we talk about environmental management we think of both the natural environment (air, land, water, resources, plant and animal life), and the human environment (human beings and the built environment).

Global Environmental Issues

Human activity has resulted in environmental impact that can be seen on a global scale.

Click on the world to see the main environmental issues facing the world today.

- Resource Depletion
- Biodiversity Loss
- Acid Rain
- Ozone Depletion
- Greenhouse Effect
- Global Warming
- Climate Change

Resource Depletion

- Resources such as timber, oil and minerals are naturally occurring.
- We use these natural resources at a rate greater than they can be replenished. This is called **Resource Depletion**.
- For example, people have consumed most of the world's **fossil fuels** in 200 years, yet they take millions of years to be created naturally.



Click here to read more about oil depletion

Hubbert Curve – Peak Oil

- Dr M King Hubbert was a geophysicist who was best known because of his startling prediction in 1949, that the fossil fuel era would be a very short duration. His prediction in 1956 that US oil production would peak in 1970 and decline thereafter was scoffed at but then his analysis turned out to be remarkably accurate.
- Peak oil is the point in time when the global production of oil will reach its maximum rate, after which production will gradually decline.
- Reserves of fossil fuels will meet rapidly rising demands only until 2030 and only if hundreds of billions of pounds are poured into new facilities.
- We rely on crude oil for many uses in our industry. Refined to petroleum, it fuels the transport we use for deliveries and business travel, makes the plastics we use for packaging, synthetic cleaning cloths, polyester uniforms and protective clothing and synthetic lubricants. What would we do without it?

Causes of Resource Depletion

Can you think of two causes of resource depletion?

Click the buttons to reveal the answers

Population Growth

The number of people on our planet has grown rapidly over the last 100 years. As the world's population grows, more natural resources are needed for food, clothes and shelter.

Lifestyle

Generally speaking, the richer we are, the more resources we consume.

As quality of life improves around the world, the rate of resource depletion increases.

Types of Resources

There are two types of resources:

- Renewable
- Non-Renewable

Let's take a look at what these terms mean

Non-Renewable Resources

A non-renewable resource is something that, once it has been consumed, can never be replaced.

Renewable resources will never be depleted no matter how much they are consumed.

Are the following renewable resources or non-renewable?
Click and drag them into the right categories.

- Solar energy
- Wind energy
- Gas
- Oil
- Coal

Renewable Resources

Renewable resources can also include plants, trees and animals if we use them carefully.

But if we use them up quicker than they can grow, we will run out completely.

To ensure we always have these resources we can either:

Replace whatever we take, or;

Reduce use and allow the resource to replenish naturally

Do you use timber in your business?

Try to purchase wood that has come from a managed forest (e.g. Forest Stewardship Council Certified). You can be safe in the knowledge that for every tree that is cut down, at least one tree is planted to replace it.



[Click here to find out more.](#)

Deforestation - Read more

- Deforestation is clearing the world's forest on a huge scale. Areas of forest the size of Costa Rica are lost each year. At the current rate of deforestation the world's rainforest could completely vanish within a hundred years.
- Deforestation results in the loss of habitat for millions of plant and animal species. Trees also play a critical role in absorbing the greenhouse gases that fuel global warming. Deforestation results in larger amounts of greenhouse gases entering the atmosphere, increasing the speed and severity of global warming.
- The primary cause of deforestation is agriculture. Farmers clear forest areas to plant crops or graze livestock. Logging for timber and paper products also causes countless trees to be cut down each year.
- It is possible to slow the rate of deforestation by carefully managing forest resources. Where tree felling occurs it should be balanced by the planting of enough young trees to replace the older ones felled in any given forest. The number of new tree plantations is growing each year, but their total is still far below the area being deforested.
- We rely on timber products in our industry, particularly wooden pallets used for packaging and paper in our office activities. By choosing timber products bought from a managed forest (such as Forest Stewardship Council Certified) means that for every tree that is cut down at least one tree is planted to replace it.

Biodiversity

Biodiversity is the variety of different species and ecosystems on the planet.

Biodiversity can be depleted just as other resources can.

Right now the world is losing huge numbers of plant and animal species and the rate of loss is accelerating.

In fact more than one species is lost every hour somewhere in the world. Once a species has gone it can never be recovered. By the time you complete this course 3 more species will be extinct!

Biodiversity is primarily due to habitat destruction and industrial pollution.



[Click here to read more about biodiversity](#)

Biodiversity loss – Read more

Experts blame direct human influences, such as habitat destruction, as the main reason for biodiversity loss. Humans are not removing individual species from the Amazon – we are destroying the entire forest, which has a huge impact on the biodiversity of the area. At the current rate of deforestation nearly 50% of the Amazon rainforest will either be lost or severely degraded by 2020.

Other causes of biodiversity loss include:

- Climate change – Climate change, caused by emissions of greenhouse gases when fossil fuels are burnt, is making life uncomfortably hot for some species and uncomfortably cold for others. This can lead to a change in biodiversity of individual species and ecosystems around the world.
- Invasive species - Whether introduced on purpose or accidentally, non-native species can cause severe problems in the ecosystems they invade, from affecting individuals to causing huge changes in ecosystem functioning and the extinction of many species.
- Exploitation of natural resources – Resulting in loss of habitat.
- Pollution – Transport, industry, construction, extraction and power generation all contribute pollutants to the air, land and water. These chemicals can directly affect biodiversity by leading to chemical imbalances in the environment that ultimately kill species and habitats.

How Does This Affect Me?

The natural environment provides us with food, natural materials and medicines.

The extinction of certain species can destabilise ecosystems, leading directly to the loss of additional plants, animals or microbes.

Click the pictures to reveal the impact of biodiversity loss on us.

Bees – Bees pollinate plants and flowers ensuring that they provide nutrition for other animals (including crops that we grow and eat). No bees = no crops=no food for us or our livestock

Wheat – Diseases like Wheat Stem Rust can wipe out a whole crop species, causing food shortages. Growing a selection of wheat strains improves the resilience of the crop – some wheat strains will die, but some will survive.

? – There are millions of species not even discovered yet that could hold cures for medical issues and diseases. If we lose them, we won't be able to use them.

Acid Rain

Acid rain is caused by the emission of nitrogen oxide and sulphur dioxide from industry and vehicles. When the gasses combine with water in the atmosphere the rain becomes more acidic.

Do you remember seeing images like these in the 1990s?

Acid rain damages vegetation, aquatic ecosystems and buildings.

Acid Rain

But it's not all bad, acid rain is actually improving in some areas!

Technology, such as scrubbers and catalytic converters, have helped to reduce emissions of nitrogen oxide and sulphur dioxide.

This has reduced acid rain throughout Europe.

What can I do to help? Reduce emissions by cutting down on business travel and investigating cleaner energy solutions like solar or wind energy.

Ozone Depletion

Remember the hole in the ozone layer? It's not something we hear so much about now.

The ozone layer is a natural layer of gas around the earth that protects us from harmful types of sun rays that cause cancer.

In the 20th Century the use of aerosols, refrigerators and air-conditioning units emitted compounds called Chlorofluorocarbons (CFCs) and halons.

The CFCs and halons caused the ozone layer to thin, letting in more of the harmful sun rays.

The production and use of CFCs and halons are now banned by international law. As a result scientists have seen a recent improvement in the ozone layer. The hole may even close over by 2050!

Take a break – play a game of Eco Bingo

Welcome to Eco Bingo!

We will give you a definition. You then have to pick the correct word that matches the definition from the Eco Bingo Machine.

Play!

Correct!

Try Again!

Score Card

Definition #1: Resources that are replenished by our planet and will never run out (for example wind or solar power)

Renewable Resources

Fossil Fuels

Carbon Footprint

Definition #2: Using natural resources faster than they can be replenished.

Natural Gas

Deforestation

Resource Depletion

Definition #3: Everything isn't me!

The environment

The atmosphere

The ozone Layer

Greenhouse Effect, Global Warming, Climate Change

Familiar terms? These global environmental issues are often on the news and are the most serious environmental challenge facing our society.

Do you know what are these issues are and how they interact?

Essentially each one drives the next.

The Greenhouse Effect is best understood by looking at the diagram opposite. The Greenhouse Effect process occurs when incoming solar radiation is trapped by a presence of Greenhouse Gases (such as Carbon Dioxide and Methane) in the atmosphere. The process is called the Greenhouse Effect because the gases retain the heat like the glass in a greenhouse.

It's a totally natural process and if it didn't happen, the earth would be too cold to support life.

Global Warming

So what's the problem?

Human activity has increased greenhouse gases. This has increased the Greenhouse Effect and the earth is now warming at a rate never before seen in our lifetimes. This is 'Global Warming'.

Global Warming

Global Warming is the average annual increase in global temperature caused by the activities of mankind.

The two main causes of global warming are:

Burning fossil fuels - Fossil fuels are derived from organic matter which has been deposited over geological timescales (e.g. Coal, Oil and Gas). When they are combusted they release carbon dioxide (CO₂) and other greenhouse gasses into the atmosphere.

Deforestation - Contributes to global warming by the removal of trees that would otherwise absorb carbon dioxide from the atmosphere.

Burning fossil fuels and deforestation have increased over the last 150 years and this has contributed to global warming.

Climate change

Climate Change is the result of global warming.

The term climate change is used to recognise that global warming has different effects in different parts of the world. Some countries may suffer extreme heat and droughts, others may experience an increase in rainfall or cooler temperatures than usual.

Why Does It Matter?

Click the points on the map to find out more

Text for Impact of Global Warming Activity

- Melting ice caps - In 2002, the Larsen B ice shelf broke away from the Antarctic Peninsula. 500 billion tonnes of ice floated into the sea, breaking up into thousands of vast icebergs. The collapse of Larsen B dumped more ice into the Southern Ocean than all the icebergs over the previous fifty years put together.
- Heat waves are occurring more frequently. In August 2003 record high temperatures were noted across Europe. This heat wave accounted for 15,000 premature deaths across Europe.
- Increased wet weather and storms. Between 2005-2007 Europe has experienced some of the worst floods of all time.
- Drought - In the Sahel there has been an average 25% decrease in annual rainfall over the past 30 years
- Sea levels worldwide have been rising at a rate of 3.5mm per year since the early 1990s. Low lying islands are at risk of being submerged by rising sea levels, islands that are part of Kiribati (a Pacific island nation) have already been submerged. Coastal European cities like Venice, could also be in trouble.
- In 2010, drought in Russia resulted in wheat yield reductions of 40%, leading to price increases.

Climate Challenge Video

- *Partners to decide whether to keep English video or to find a local language equivalent.*
- <http://www.youtube.com/watch?v=zzjOcOcQ90U>

Climate Change Sceptics

That's not what I've heard...

Not everyone believes global warming is happening or that human activity has any impact on the Earth's climate.

- The data is flawed, scientists' global warming predictions are wrong
- The influence of human activity on the climate is tiny – we are not the cause of the problem and we can't stop global warming
- Even if what you're saying is true, a warmer world would be better for us!
- OK, I accept global warming is happening but we have more serious issues to deal with right now

It's true there are still many uncertainties about the climate and any influence we may have on it. It is very difficult to predict future trends, especially in environmental issues.

However, there is a growing scientific consensus that, even taking into account the natural variability of the climate, something out of the ordinary is happening and it is a result of human activity.

International Response

Countries worldwide recognise the threat of climate change. International summits have been held to identify initiatives and agreements that will help to slow global warming and mitigate against climate change. The main objective is to reduce emissions of greenhouse gasses.

What Can I Do?

- By making small changes to the way we operate, we can contribute to a global effort to reduce environmental issues.
- Later in the course we will look at the changes we can make within our industry to achieve this.

Module 1 Quiz

- Now it is time for this module's multiple-choice quiz!
- You must answer all questions correctly in order to pass this module.
- Don't worry, you can try again if you do not get the answers correct the first time.
- Click the 'Next' button to begin...

Question 1

1. How would you describe a natural resource?
 - A. Modern plastics
 - B. Naturally occurring materials**
 - C. Energy efficient materials
 - D. Materials that can only be dug up from the ground

Answer A – Try again!

Answer B – Correct!

Answer C – Try again!

Answer D – Try again! Materials we dig up, such as minerals or oil are natural resources, but there are also natural resources available on the Earth's surface.

Question 2

2. What is the natural mechanism that keeps our planet warm?

- A. Renewable Resources
- B. Global Warming
- C. The Greenhouse Effect**
- D. The Ozone Effect

Question 3

3. The primary causes of global warming are:
- A. Melting ice caps and rising sea levels
 - B. Biodiversity loss
 - C. Burning fossil fuels and deforestation**
 - D. The hole in the ozone layer and resource depletion

Well done! You have completed module 1.

In module 2 we'll be looking at environmental issues closer to home.

Module 2 – Business and the Environment

So far we have reviewed the main **global** environmental issues.

Now let's focus on your local environment - your town and your neighbourhood, where you live, play and work.

What are the environmental issues you see or deal with on a day to day basis?

- Litter in the streets
- Noisy neighbours
- Business waste
- Chemical and oil spills
- Pollution of local streams and rivers
- Pollution of local parks and woodland
- Local air pollution
- Dust

Many of these local environmental issues are caused by business activities.

This module takes a closer look at the impact of business and industry on the local environment.

Inputs, Operations and Outputs

A business is made up of a series of activities or 'operations' that take place on site in order for the business to function.

The processes of securing contracts, managing projects, manufacturing the product and distributing the product all vital operations.

Each operation requires resources to function. These resources are called 'inputs'. They include materials, energy and water. We could not produce our product without inputs.

Operations also have 'outputs'. Outputs are the waste, pollution, products and services that result from the organisation's activities.

Each input and output has an environmental impact. Identifying the inputs and outputs of your organisation is the first step to reducing the environmental impact of your company.

Drag and Drop Activity – Inputs, Operations and Outputs

Identify the operations, inputs and outputs of this factory by dragging them into the correct box.

Make a mental note of any that are relevant to your business.

Operations

Manufacturing process Purchasing Transport of finished product Administration Staff commuting Sales meetings Packing of product	Storage and use of chemicals Water treatment processes Painting processes Plating Metal finishing Surface treatment Metal pressing Heating and cooling
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Inputs

Aluminium	Oil	Silver
Glass	Gas	Nickel
Rubber	Propane	Cleaning products
Copper	Timber	Paper
Steel	Plastic packaging	Diesel
Degreaser	Polystyrene packaging	Paint
Compressed air	Electricity	Adhesive
Water	Iron	Employees
	Machinery	Chemicals

Outputs

Product Waste plastics Effluent (waste water) Heat Pollution Waste chemicals Scrap metal	Noise Dust Odour Solvent emissions Waste oil Waste cleaning materials
-------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------

The Impact of Inputs

Some of the input of our businesses contribute to the global issues we reviewed in module 1.

Can you make the link between the inputs below and the global environmental issue that it can contribute to?

Drag the answers to the correct statement.

- Timber consumption
- Energy consumption
- Oil consumption

_____ is a cause of Deforestation
_____ is a cause of Global warming
_____ is a cause of Resource depletion

Energy Consumption

According to the International Energy Agency, global energy demand is projected to increase by 60% in the next 25-30 years.

The majority of our energy is sourced from fossil fuels (coal, gas and oil). Coal, oil and gas are called "fossil fuels" because they are formed from the organic remains of prehistoric plants and animals.

The Problem with Fossil Fuels

Burning any fossil fuel produces carbon dioxide, which contributes to the "greenhouse effect", warming the Earth.

Fossil fuels are also non-renewable resources, which means they are running out and therefore becoming more expensive.

More efficient use of energy or the use of alternative energy sources e.g. renewable resources can help reduce the environmental impact and business costs.

Energy Use In Your Business

Please identify (by clicking) all the equipment using energy in this business.

Machinery and motors

Lighting

Heating

Compressed air

Computers and printers

Can you think of any ideas to reduce energy consumption?

Save your ideas for later in the course.

Pollution

Pollution occurs when the inputs or an output of an activity harm the environment, property, humans or all three.

The key to environmental protection is identifying your potential pollutants and preventing them from escaping into the environment and causing harm.

Air Pollution

We all need to breathe clean air to live healthy lives. However, the everyday activities of many businesses can contribute to air pollution:

- Burning fossil fuels
- Road Traffic
- Power Stations
- Industrial processes

Types of air pollution

Types of air pollution include:

- Gases e.g. Sulphur dioxide, Nitrogen oxides, volatile organic compounds (VOCs), ozone
- Emissions e.g. Particular matter, lead or heavy metals
- Odours
- Dust

Volatile Organic Compounds

Do you have a plating plant on site?

Plating plants release volatile organic compounds (VOCs) into the atmosphere. The VOCs evaporate from solvents used in plating processes.

In the presence of sunlight, VOCs react with nitrogen oxides to create ground level ozone and smog.

VOCs can cause harm to humans including eye, nose and throat irritation, vomiting, allergic skin irritation and dizziness.

Try to reduce VOCs if you can. We'll look into ways of doing this later in the course.

Noise Pollution

Environmental noise is sound that has the potential to cause a nuisance, annoyance or disturbance to an individual's quality of life.

Environmental noise is typically that which can be heard beyond the boundary of your premises. Health and Safety noise is that which can be heard within your organisation.

The 2 main sources of noise in your business are likely to be machinery and transport.

If you work in an industrial area, noise is unlikely to be a problem. If your business is based near a residential area, it is more likely to impact on the residents and be classed as a pollutant.

Noise can cause health problems, disruption to wildlife (e.g. breeding birds), cracks and structural damage to buildings.

Water Pollution

Water covers over 70% of the Earth's surface and is a very important resource for people and the environment.

Water pollution affects drinking water, rivers, lakes and oceans all over the world.

As a consequence water is heavily regulated and both consumption and waste water (effluent) should be carefully managed.

Effluent

Waste water produced by businesses is called effluent.

If allowed to escape into the environment effluent can cause serious water and land pollution, including damage to habitats, loss of wildlife and contamination of drinking water.

In our industry, effluent can be produced from various activities including:

- Metal finishing activities e.g. **Surface treatment**
- Site cleaning
- Coolant
- Chemical or effluent spill

The surface treatment of metals produces toxic effluent that may include cyanides, substances with low biodegradability and accumulative effects, ions such as chlorides and sulphates as well as metals such as nickel or silver.

How do you use water in your business?

We've looked at the impact of water pollution as an output. Now let's look at the impact of water consumption as a business input.

How do you use water in your business?

Plating activities

Cleaning

In the bathroom

Vehicle washing

As part of a cooling process

Water as a Resource

Water is a precious resource and there is only so much available. If we use more than our fair share or pollute it, it cannot be replaced.

The United Nations recommends that people require a minimum of 50 litres of water a day for drinking, washing, cooking and sanitation.

Can you guess the current average daily consumption of water per person?

Answer: The average daily consumption of water per person is estimated to be around 600 litres per day.

Land Pollution

There are 2 types of land pollution:

- Contaminated land
- Waste

In this section of the course we will focus on waste.

Contaminated land is land that is polluted with a substance that can cause harm to humans, wildlife or property.

The main causes of contaminated land are industrial processes and chemical spillages

The Environmental Impact of Land Pollution

As well as being very expensive and difficult to clean up, land pollution can have a number of harmful effects which can include the following.

Click on the pollutants to reveal the environmental impact:

- Harm to people
- Harm to wildlife
- Harm to humans and animals (through contamination of the water supply or food chain e.g. crop absorption of pollutants)
- Fires or explosions caused by dangerous gases or materials.

Waste in Europe

Each year, in the European Union alone, we throw away 3 billion tonnes of waste - some 90 million tonnes of it hazardous!

This amounts to about 6 tonnes of solid waste for every man, woman and child in Europe, according to Eurostat statistics.

Most waste in Europe is transported from the site of production (e.g. your business) and then disposed of in landfill sites or burnt in an incinerator.

If waste is not disposed of properly it causes land pollution. Even if we dispose of waste correctly - landfill and incineration are still damaging to the environment.

Know Your Waste Types

There are 3 categories of waste:

Inactive waste (also known as 'inert')

Do not react when disposed to landfill in normal conditions. Pose virtually no environmental or health threat. Uncontaminated soils and rocks, concrete, glass and brick rubble are all inactive wastes.

Active Non-hazardous waste

Have the potential to undergo physical, chemical or biological changes when disposed of to landfill. Include timber and plastics.

Hazardous waste

Waste with the greatest potential for causing harm to the environment or public health. Include flammable liquids, fluorescent light tubes, electronic equipment, oil and chemicals.

Waste Stream Activity

Drag the waste streams into the right category.

- Metal waste
- Waste oil
- Waste chemicals
- Packaging including cardboard and wooden pallets
- Aerosol containers
- Waste PPE used contaminated with chemicals
- Oily rags
- Waste containers for chemicals and oils
- Paper
- Materials used to clean up oil or chemical spill
- Batteries
- Bubble wrap and polystyrene
- Waste electrical equipment e.g. Computers
- Fluorescent light tubes
- Food waste

What happens to our waste?

If we throw away our waste properly then it is not a problem right? Unfortunately not! Most of waste either ends up in landfill or is incinerated.

Both of these solutions can also cause environmental damage including:

- Water and land pollution from leaking landfill sites
- Methane gas from landfill sites contributes to global warming (it is 20 times more effective than Carbon Dioxide at trapping heat in the atmosphere!)
- Gases from incineration can contribute to acid rain.
- The incineration of plastics can release toxic emissions.
- The ash from incinerators may contain heavy metals that are dangerous to human health.

To really reduce the environmental impact of waste, we need to reduce the amount of waste produced in the first place.

Litter

Everyone hates litter! Waste that is disposed of improperly, at an inappropriate location causes injury to wildlife, pose threats to human health and it looks terrible.

Litter can be caused by people dumping waste to avoid paying to get rid of it properly or to save time. This is called fly tipping.

Accidental litter is a result of waste falling from poorly secured waste containers and waste collection vehicles.

Think about the area around you site. Is there lots of litter? If so, think about getting more bins or train staff to dispose of waste properly.

Impacts of waste – Great Pacific Garbage Patch

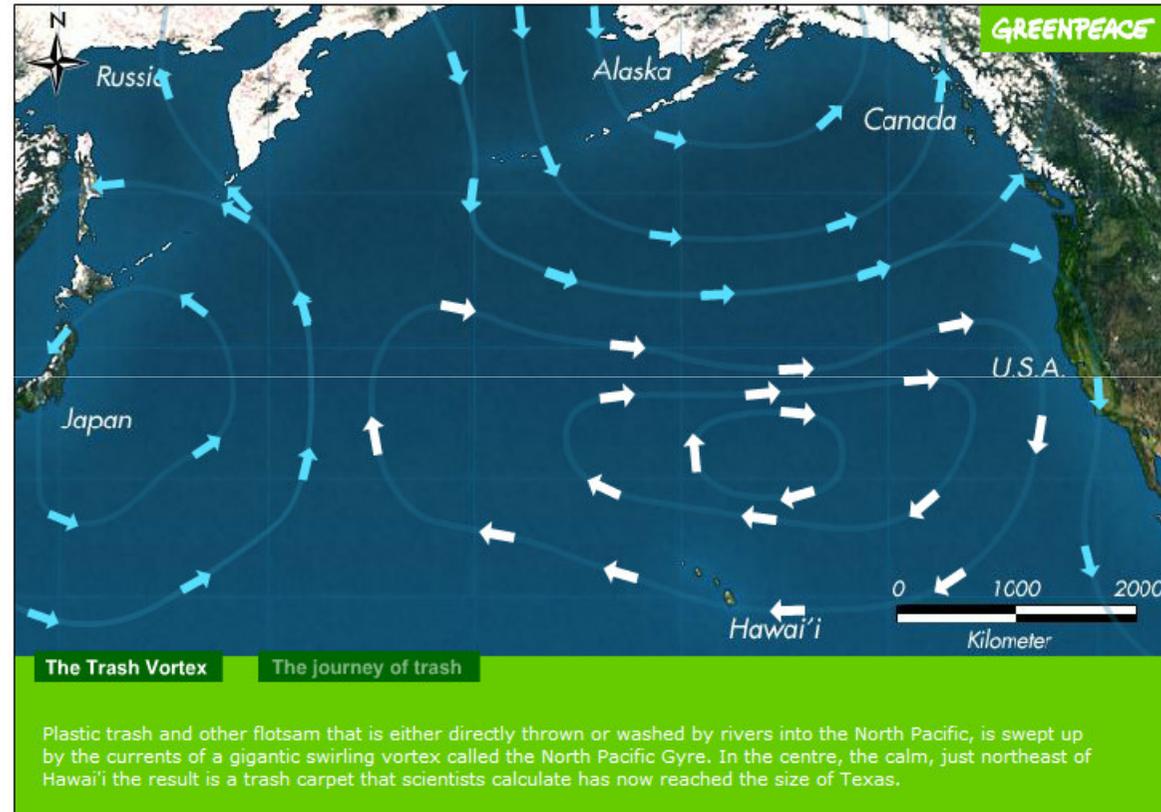
This is an excellent example of environmental damage caused by years of poor waste management.

The centre of the North Pacific Gyre is relatively stationary region of the Pacific Ocean. The circular rotation around it draws waste material in. This has led to the accumulation of flotsam, plastic and other debris, in huge floating 'clouds' of waste. It is nicknamed: 'The Great Pacific Garbage Patch'.

The White arrows are the actual garbage patch. The blue arrows are the path the garbage takes into pacific gyre.

The plastic debris sits just under the surface of the ocean, so it is not seen from satellites; you can only see it from the ships that sail through.

The Great Pacific Garbage Patch



Pollution Risk Assessment

So far we have looked at Air, Water and Land Pollution.

Completing a Pollution Risk Assessment can help you identify the most serious pollution risks in your organisation.

Below is an example Pollution Risk Assessment. Each pollutant is scored for how frequently it might occur and also its level of severity.

Pollutant	Frequency (How often the pollution will occur) 1=occurs rarely 5=occurs often	Severity (How badly the pollutant can affect the environment) 1=low impact 5=high impact	Risk rating (The Risk Rating is calculated by multiplying Frequency by Severity)
Oil spill	2	5	10
Noise	3	1	3
Dust	4	2	8

The pollutants with the highest risk rating are the ones to focus on first.

Pollution Risk Assessment

This would be a good time for you to complete a Pollution Risk assessment for your organisation.

You can use **download this template** to review all the potential pollutants in your organisation. You will also find a copy of this in the GreenPoint Toolkit.

Transport and the Environment

How do you use transport in your organisation?

- Travelling from home to work
- Deliveries
- Distributing the product
- Business meetings
- Sales meetings

Transport and the Environment

The environmental and financial costs of transport overlap with issues we have already covered. Drag the words to complete the sentences.

The majority of road transport is fuelled by ***** and *****. These fuels are derived from crude oil, which is a non-renewable resource and very *****.

Vehicles emit more ***** than any other sector. Carbon dioxide is a ***** and contributes to *****.

***** from transport include nitrogen oxides, particles, carbon monoxide and hydrocarbons. All have a ***** on the health of local ***** , animals and vegetation.

Vehicles are also a major source of ***** pollution. Sources include engine and tyre noise, ***** , reversing warnings and squeaking brakes. Vehicles have been subject to noise standards for many years through *****.

Petrol, diesel, expensive, carbon dioxide, greenhouse gas, global warming, air pollutants, damaging impact, people, noise, car horns, EU legislation.

Module 2 Quiz

- Well done, you have almost completed Module 2! Now you just have to complete this module's multiple-choice quiz.
- You must answer all questions correctly in order to pass this module.
- Don't worry, you can try again if you do not get the answers correct the first time.
- Click the 'Next' button to begin...

Question 1

1. Name 3 environmental inputs of a business

- A. Waste, effluent, bad smells
- B. Oil and chemicals, metal, energy**
- C. Investment, training, staff
- D. Air, Water and Land Pollution

Question 2

2. According to the International Energy Agency, how much is global energy demand expected to increase in the next 25-30 years?

- A. 60%**
- B. 70%
- C. 80%
- D. 90%

Question 3

3. What term is given to waste that has the potential to undergo physical, chemical or biological changes when disposed of to landfill?
- A. Inactive Waste
 - B. Inert Waste
 - C. Active Waste**
 - D. Animated Waste

Module 3 – The business benefits of environmental improvement

Hopefully this course has given you an incentive to reduce the impact of your business on the environment.

However, to make environmental improvements you will need to convince your colleagues that environmental protection is important!

For some people the environment is not a good enough reason. In module 3 we will look at the main business benefits.

Business Benefits

The benefits fall into 3 categories. Can you guess what they are?

- Saving money and Increasing Profits
- Creates a safer, happier workplace
- Compliance with environmental legislation

Financial Benefits

There are 3 key ways that an EMS can increase the profitability of your organisation.

Can you think what these are? Try to list all 3 before you move on to the next screen...

3 Financial Benefits

1. More efficient processes lead to increased profit
 - Efficient use of inputs e.g. using less materials, energy and water = lower costs
 - Reduction of outputs e.g. waste and effluent = lower costs
 - Don't forget! When you throw something away, you're paying for it twice - once when you purchased it and again when you pay for disposal.
2. Environmental policies can help to secure existing contracts and win new business. Customers need to know that your company is environmentally responsible and efficient, they are more likely to work with you if you can prove this.
3. Better awareness of environmental legislation and improved control reduces risk of fines. It also prevents loss of business caused by damage to the company's reputation.

A Better Working Environment

Environmental management and innovation leads to a better working environment and happier, safer staff.

Environmental Legislation

Did you know that there are hundreds of pieces of environmental legislation in place throughout Europe?

Awareness of environmental legislation is extremely important. Every company must comply with legislation to avoid prosecutions such as fines, business closure or prison.

One of the main benefits of environmental control is that it helps to ensure that you are working in line with legislation.

Legal Activity – Match the Fine to the Crime

- We are going to show you a brief summary of a prosecution that has taken place in Europe. All you have to do is click the amount of money that you think the company was fined.
- [Click here to begin!](#)

Environmental Prosecution Activity

Match the fine to the crime by clicking and dragging the fine.

A company manufacturing door handles was using the solvent Trichloroethylene for degreasing. The company was not registered to use the hazardous, cancer causing, solvent. It was also emitting a trichloroethylene concentration 100 times higher the limit set by regulation.

a.€ 306,000

b.€ 500,000

c.€ 104,000

Answer a. The company was given 2 penalties. A mild fine of €6,000 for not being enrolled in the appropriate register. For the more serious crime of exceeding the emission limits the company was fined €300,000.

Environmental Prosecution Activity

A factory specializing in the recovery of lead from used batteries has been convicted of endangering lives. They exceeded the limit of their environmental permit for heavy metal emissions. The emissions caused lead poisoning of local people and damage to the air, water and land in the area.

a.€120,000

b.€50,000

c.€260,000

The courts ordered the company to pay €120,000 in damages and interest to victims.

Environmental Prosecution Activity

A machining company discharged acidic waste water into sewers without permission. The acidic water corroded and damaged a section of the sewer system, causing leaks into the subsoil.

a. €20,000

b. €5,000

c. €35,000

Answer c. The company was fined €500 and the obligation to bear the costs of repairing the damaged portion of the sewer, which amounted to €30,000.

Environmental Prosecution Activity

Huge amounts of a stinking and greasy oil mixture leaked from the tank of a Biogas plant. The black mass poured into a small brook, then into the River Iser, causing terrible environmental damage.

a.€20,000

b.€15,000

c.€10,000

The incident happened because the owner ignored legal orders to install a system to prevent leakage. The owner had to pay a fine of €10,000 and received a 6 month suspended jail sentence. The clean-up procedure by around 200 firemen cost € 90,000.

How can I ensure legal compliance?

Avoid fines and prosecution by introducing a procedure to ensure compliance with environmental legislation. Why not download this list and use it as an action plan.

1. At least one person in your organisation should be responsible for identifying which pieces of legislation apply to the company. It is a good idea to make a list – called a ‘Register of Legislation’.
2. Work out what you need to do to comply with the legislation.
3. You may need to introduce procedures and control measures to minimise the risk of breaching legislation.
4. You may need to train staff to ensure they comply with the legislation.
5. Carry out a legal compliance audit. Put the requirements of the legislation into a checklist and use it to review your site. Check that all operations are carried out in compliance with the legislation.
6. Check for any new legislation or changes to existing legislation on a regular basis.

The Structure of Legislation

There are 2 levels of legislation that affect our activities:

- European legislation – Directives & Regulations
- UK legislation – Acts and Statutory Instruments

European Union Legislation

Most national environmental legislation originates at European level. European legislation is transposed into national legislation by each member state.

The main legal instruments are EU Directives and Regulations.

Each member state can choose how it fulfils the requirements of the Directives.

Whereas regulations usually apply directly i.e. member states are not able to choose how they implement the legislation nationally.

National Legislation

In the UK there are 2 levels of environmental legislation:

Act of Parliament

Acts provide the policy principles and broad environmental requirements.

Statutory Instruments (also known as regulations)

- Statutory instruments are specific and detailed pieces of legislation.
- Whereas an Act states the legal requirements in a general way, Statutory Instruments detail exactly what you need to do to meet the requirements of the Act.
- SIs may vary in England, Wales, Scotland and Northern Ireland.

Environmental Regulators

Environmental regulators enforce environmental legislation. Each body regulates a different environmental issue.

Can you match the regulator to their environmental responsibilities?

Local Authority

Local air quality management and contaminated land

Dust, smells, litter and noise pollution i.e. anything that may result in a public complaint and referred to as 'statutory nuisance'

Local Water Companies

Water supplies and sewerage

Controlling and policing discharges of trade effluent to foul drains

Natural England

Risks to wildlife and nature conservation

Geological features

Protected sites such as Sites of Special Scientific Interest (SSSIs)

Protected species such as bats, newts, badgers, and otters

Environment Agency

Regulate organisations with a high pollution risk e.g. Power stations and chemical plants

Discharges to watercourses

Waste management

Manage water resources, flood defence and fisheries

Key Environmental Legislation at EU Level

The next few pages are about the requirements of specific EU Directives and Regulations. This topic is quite technical so if you would prefer to skip these pages you can but make sure someone in your company has responsibility for ensuring compliance!

There are many more environmental Directives and Regulations than have been mentioned here. All the EU Directives and Regulations can be accessed online European Commission 'Europa' website <http://eur-lex.europa.eu/>.

EU Industrial Emissions Directive (IED)

Industrial Emissions Directive 2010/75/EU

Aims to:

‘prevent, reduce and as far as possible eliminate pollution arising from industrial activities’ by establishing, ‘a general framework for the control of the main industrial activities, giving priority to intervention at source and ensuring prudent management of natural resources...’

This means that a) companies must prevent pollution from occurring and b) if the pollution cannot be prevented practically, then the company must try to reduce their pollution levels.

To meet this requirement it helps to be aware of all the activities and materials on site that have the potential to pollute. Try using the pollution risk table in the GreenPoint toolkit to help you review your activities.

A pollution response procedure will help you to respond quickly to a pollution incident and minimise the damage caused. More information on pollution response planning is provided in module 4 of this training course.

Companies operating certain activities covered by the Directive may require an environmental permit from the national environmental regulator. You may require a permit for some of your activities particularly if you use large quantities of solvents, so it is definitely worth researching your country’s national interpretation of the Directive to find out how it applies to your company.

EU Waste Framework Directive

The EU Directive 2008/98/EC on waste, known as the 'Waste Framework Directive' defines waste and terms such as recycling and recovery.

Waste is defined as: "...any substance or object which the holder discards or intends or is required to discard..."

The Directive lays down some basic waste management principles including:

Waste must be managed without:

Endangering human health and harming the environment,

Risk to water, air, soil, plants or animals,

Causing a nuisance through noise or odours

Adversely affecting the countryside or places of special interest.

Each EU member state has transposed the requirements of the Waste Directive into its own regulations. Find out what national waste legislation applies to you and add it to your legal register.

EU Waste Framework Directive

The Waste Framework Directive also requires that:

You must only pass your waste to, or have it collected by, an authorised person. Anyone who collects and transports your waste must:

- be a registered carrier of controlled waste; or
- be exempt from registration as a carrier

Anyone who recycles, treats, stores, reprocesses or disposes of your waste must have a permit. A registered carrier should be able to produce a certificate of registration or a certified copy. If you do not check and keep proof of this, you could be held responsible if your waste is disposed of illegally (e.g. by fly-tipping).

Hazardous Waste Legislation

Waste is classed as hazardous when it contains properties that might make it harmful to our health or the environment. The Waste Framework Directive (2008/98/EC) includes an official hazardous waste list.

Legally you have a responsibility for hazardous waste until it reaches its final destination for treatment or disposal. You must obtain evidence that you have transferred the waste to a waste carrier and they must send you evidence that the waste has been accepted by the waste management centre.

Disposal of hazardous waste is extremely expensive and it can cause serious harm to the environment if not disposed of properly.

If possible, change your company's activities to minimise the production of hazardous waste. This will save money and reduce the environmental impact of disposal.

EU Fluorinated Greenhouse Gas Regulation

The EU Regulation on certain fluorinated greenhouse gases (No 842/2006) applies to all EU member states.

The Regulation aims to reduce emissions of fluorinated gases (also known as f-gases) by improving containment and monitoring of these gases and restricting their marketing and use.

The relevant f-gases include:

- HFCs - used as refrigerants, cleaning solvents and foam blowing agents
- PFCs - used in semi-conductor manufacture, as cleaning solvents and as foam blowing agents
- Sulphur hexafluoride's - used in high-voltage switch gear and magnesium production

Emissions of these greenhouse gases contribute to global warming and they are extremely persistent in the atmosphere, which means that their effects last for a long time after their emission.

EU Fluorinated Greenhouse Gas Regulation

Is this legislation relevant to me?

It could be if you use or work with air conditioning, use refrigeration units or have a high voltage switch gear.

If you have any of this equipment in place you should read the regulations and identify if it applies to you, and what the requirements are.

The F-Gas Regulations are available to read and download here: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32006R0842:en:NOT>

Legislation Help and Support

Legislation can be difficult to get your head around but sources of help and guidance are available online.

Visit the Environment Agency website for more information :

<http://www.environment-agency.gov.uk/>

Environmental Management Systems

So far in module 3 we have covered:

The benefits of environmental control and improvement and key environmental legislation.

It is a lot to take in!

What we need is a structured approach that will help us to manage it all.

One way to achieve this is to implement an environmental management system for your organisation.

Environmental Management Systems

An Environmental Management Systems (EMS) is a structured plan that aims to:

- Minimise the environmental impact of the organisation
- Ensure compliance with environmental legislation
- Improve environmental performance

An EMS includes procedures that explain how the company can achieve these aims.

Environmental Management System Standards

EMS standards, such as ISO 14001 and EMAS, provide a model to follow when setting up and operating a management system.

All management system standards are based on the principle of continual improvement. This means always trying to improve our environmental performance.

ISO 14001 and EMAS

ISO 14001 is an internationally recognised standard of environmental management.

Eco-Management and Audit Scheme (EMAS) is the same but at a European Level.

Both standards help companies to identify and control their environmental impact, work in line with legislation and constantly improve their environmental performance.

If you successfully pass an audit, then your company can be certified to ISO 14001 or EMAS standard.

The GreenPoint toolkit includes a summary of the ISO 14001:2004 requirements.

What makes a good Environmental Policy?

The first stage of implementing an Environmental Management System is to write an environmental policy. This provides a basic summary of the EMS. If you want to achieve ISO 14001 certification the policy must include certain information and be appropriate to the company.

What do you think makes a good environmental policy? Drag the options onto the flip chart.

What Makes a Good Environmental Policy?

- A commitment to reduce water consumption by 5% - if you can prove it, add it to the policy. But make sure to update the policy once you have achieved the target. Otherwise you will be expected to reduce by 5% every year!
- Reference environmental objectives and targets
- A commitment to the customer regarding product quality – This would be better on your Quality Policy
- Commitment to continual improvement
- A commitment to reduce energy consumption by 80% - Don't include unrealistic targets, you should be able to back up all statements with evidence
- Jargon free – That's right, avoid highly technical language
- Recent - ideally reviewed and updated annually
- A commitment to best practice in Health and Safety – This should go on your Health and Safety policy
- A commitment to comply with environmental legislation
- A list of environmental law that affects your organisation – The policy should be short and concise, keep a separate legal register, rather than including the list on the policy.
- Communicated and available to all employees – Yes! Display the policy in the workplace and communicate it in meetings or via email.
- Supported and signed by top management
- Available to the public – Why not put a copy on the company website
- Short and concise
- Relevant to the organisation
- A commitment to prevention of pollution
- Implemented

Getting Started – Carry out an environmental review

Imagine your manager has decided that an EMS is a good business decision and has asked you to set it up.

What do you think would be the best approach? Put a plan together using the actions listed below. Drag the options to the notepad.

Firstly I need to identify the...

- inputs, outputs and operations of my business
- pollution risks

I'm going to need some help, I need a...

- Team of colleagues from different departments to help support this project!

I had better check what legislation applies to the company, I will...

- Add the relevant legislation to my legal register and check that we are doing everything we need to.

If I am going to make an improvement, I need to know how we are performing now, I had better collect data on...

- Water consumption
- Energy consumption
- Materials purchased
- Waste produced
- Environmental incidents e.g. Oil spill
- Transport use and fuel consumption

After the review

Report the findings of your environmental review to top management. It is important that they have this information as they may decide that the company needs to make environmental improvements.

Take action!

If you think the company could be more efficient, suggest setting some objectives and targets for environmental improvement.

If you notice that there are lots of spillages happening during chemical deliveries, recommend putting a procedure in place for deliveries.

Staff training can be an effective way to solve problems. Why not suggest holding a training session for accepting deliveries.

Once you have made the changes, check to see if they have been successful.

Monitoring and Measurement

We just mentioned that monitoring is one of the first steps to finding out how efficient your company is and where there is room for improvement.

Decide what measurements you need to take to monitor performance and then gather this data on a regular basis.

Why not start with:

- How much material the company uses (e.g. Metal, chemicals, paper and packaging)
- How much waste the company produces
- How much water the company uses
- How much effluent the company produces
- How much energy (gas, electricity or other fuels) the company uses

Remember: If you don't measure it, you can't manage it!

Monitoring and Measurement

The data you collect will help you to:

- highlight areas for improvement and;
 - track your performance over time
- including successful improvements that you have implemented!

Monitoring can be as simple as taking meter readings regularly or tracking information from bills.

In your GreenPoint toolkit you have an example Monitoring Spreadsheet. Adapt the spreadsheet to your company's activities and use it to start recording monitoring data.

Download a copy now to get started.

Monitoring and Measurement – Site Inspections

Monitoring does not only involve collecting quantitative (numerical) data. It should also include regular site inspections to check that procedures are being carried out correctly and identify any environmental risks.

In Module 4 you will have access to lots of checklists that will help you to review the environmental performance of your business on a regular basis. The checklists are also available in your GreenPoint Toolkit.

Objectives and Targets

Monitoring and measuring will help you decide where you can make improvements within the company.

Use the information to put together a list of objectives and targets for environmental improvement.

Objective and targets can result in cost savings as well as environmental improvement.

In Module 4 we will give you lots of ideas.

Objectives and targets

Successful objectives and targets are written using the 'SMART' format:

- **S**pecific
- **M**easurable
- **A**chievable
- **R**esponsibility assigned
- **T**imebound

Writing Effective Objectives and Targets

It can be difficult to stick to the SMART method. Can you improve these objectives and targets?

Partners (and Phil) please see the Notes Section below for the translation required for this activity

Objective and Target Activity

Objective	Specific Target	Measurable	Achievable	Responsibility assigned	Timebound
Reduce energy consumption	Reduce energy consumption by 5%		Increase awareness of energy consumption by: putting 'switch off' reminders on light switches and electrical equipment, carry out checks to make sure equipment and lighting is switched off when not in use. Replace current lighting with energy efficient alternatives.	Tamara Carel	
Reduce waste aluminium		Use waste bills to gather data on the number of skips of aluminium waste uplifted each week.			Aim to achieve reduction by December 2014
Improve housekeeping on site	Site inspections should show: chemicals and other materials are stored safely and securely, waste should be segregated into the correct bins, there should be no evidence of chemical, oil or effluent spillage or leaks.			Philippe Clothier	Achieve within 1 month - by January 2014

Objectives and Targets

You can use an objectives and targets template like this for your own organisation. There is a copy in the GreenPoint Toolkit.

Congratulations! You have completed Module 3.

Complete these multiple choice questions
before proceeding to Module 4 - Control
measures and environmental innovation:

Question 1

What are the main benefits of implementing environmental controls and improvements?

- A. Financial, legal, environmental and social improvements**
- B. Cutting costs and purchasing cheaper materials
- C. Improved health & safety
- D. Improved quality of product

Question 2

What is the main reason for monitoring environmental performance?

- A. To see how much energy you are consuming
- B. To contribute data to scientific research
- C. It is a requirement of ISO 14001
- D. The data you collect will help you to identify areas for improvement and track performance over time**

Question 3

3. Name 2 standards for environmental management:

- A. ISO 9001 and EMAS
- B. ISO 14001 and EMAS**
- C. EMS and Certification
- D. EMS and ISO 14000

Module 4 - Control measures and environmental innovation

In module 4 we will cover top tips for:

- Environmental control to prevent pollution
- Environmental innovation to increase efficiency and cut costs

Environmental control and innovation

- Resources
- Waste
- Energy
- Water
- Effluent
- Emissions
- Emergency Preparedness and Response

Resource Efficiency

Use of materials and products, such as metal, oil, chemicals and timber contribute to resource depletion, carbon emissions and waste. These types of resources are also expensive to buy and dispose.

To minimise consumption of resources and save money on materials, projects should be carefully planned.

Aim to use the smallest amount of material needed to manufacture the product to the level of quality required. Try to use materials with a low environmental impact if you can.

Make The Most Of Your Materials

Click on the picture below for tips that can help make your oils, metal working fluids, paints and solvents go further. All these tips can be downloaded and you will also find a copy in your GreenPoint Toolkit.

- Select the correct metal working fluid for the operation. Using an unsuitable fluid leads to waste materials, poor quality products and shorter lifetime of tools.
- Choose a less hazardous fluid. New metal working fluids that are based on vegetable oils instead of mineral oil are biodegradable and less toxic.
- Use the most efficient application method available for metal working fluid. Application systems are available that produce a fine spray. 85% savings in fluid use and a 500% increase in tool life have been reported with this system.
- Good housekeeping. Store fluids, paints and oils in clearly labelled containers, in a designated area to avoid contamination.
- Control bacteria and fungi. Bacteria and fungi thrive in wet and warm environments. Carry out regular checks for bacteria and fungi in your metal working fluids. If levels of bacteria or fungi are outside specified limits then it may be possible to add biocide to control bacteria and fungicide to control fungi, rather than disposing of the fluid.
- Dry machining uses no metal working fluid. However it is only feasible in certain cases and may require the purchase of new machinery.
- Tipping a can of solvent onto a cloth often uses a much greater amount of solvent than is required. Install a pump instead that dispenses exactly the right amount.
- Use more efficient application tools for painting. High Volume Low Pressure (HVLP) spray guns are one of the most efficient ways of applying paint to surfaces.
- Accurately measure the areas to be painted. This helps to avoid mixing too much or too little paint and saves time, materials and money.

Paper Consumption

How much paper do you use in your organisation? It might be more than you expect.

Paper production can cause environmental damage due to intensive tree farming, heavy chemical use and high energy consumption during the manufacturing process. It is also expensive to buy in, produces a lot of waste and takes up space in the office.

Paperless System in Industry

Leyland Trucks manufacture light, medium and heavy-duty trucks. Until recently, assembly operators were reliant on a paper-based system of build instructions.

In 2012, the company replaced the paper system with an Electronic Work Instruction (EWI) system. EWIs are touch-screen monitors configured to display real time build details and enable the operators to record any defect and material shortage information instantly.

The project has resulted in an almost paperless factory.

Benefits of a Paperless System

Imagine you are putting forward the business case for a paperless system to your manager. How would you convince them? Click the answers below.

- **Reduces purchasing costs**
- **Reduces printing costs**
- **Reduces paper waste**
- **Frees up space used for filing and storing papers**
- **Can easily update work instructions without having to reprint multiple copies and throw out old versions.**
- **Avoids paper cuts**

Great idea, let's do it!

Top Tips for Reducing Paper Use

Click here to download Top Tips for Reducing Paper Consumption. If you do not work in the office, pass it on to one of your colleagues, they might find it useful.

Reduce the impact of paper consumption by:

- Avoiding printing where possible, use electronic documents and communication tools
- Print double sided - Ensure that all printers are set to double-sided format as default.
- Purchase recycled paper
- Put reminder posters near printers and photocopiers to encourage people to print double sided. See the GreenPoint toolkit for example posters.
- Reduce the number of printers
- Monitor printing levels by giving each employee a code
- Collect and reuse paper that has been printed on one side
- Recycle waste paper

Look out for ecolabels when purchasing paper:

- EU Ecolabel - Specifies maximum limits for discharges to water, emissions to air and energy consumption as well as requiring sustainable forestry management for virgin fibre.
- Nordic Swan – Awarded to paper mills meeting minimum environmental performance standards.



Purchasing for Resource Efficiency

Using materials efficiently in the workshop results in cost savings, but to really make a financial impact you need to evaluate how materials are purchased in the first place.

Answering a few quick questions before making a purchase can have multiple environmental and financial benefits.

Click to download this checklist of questions. If you don't deal with purchasing, show the checklist to the person that does as they might find it useful.

Resource Efficient Purchasing Checklist

- Do I really need to buy it?
- Am I buying more than we need?
- How good is our stock control – is more being ordered than is actually required, resulting in materials being disposed of before they are used?
- Is it heavily packaged? If so, can the supplier take back the packaging, so we don't have to pay for disposal?
- Can the item be reused?
- Which is the best supplier?
- Is there a supplier close by to reduce transport emissions during delivery?
- Can the supplier demonstrate good environmental performance?
- Bulk buy if possible to save delivery journeys and get discounts
- Is it possible to refurbish and repair what we already have, rather than buying a replacement?
- Nominate just a few colleagues to control the stock and use of oils on site. This helps prevent over-use and over-buying.
- Monitor consumption and waste to identify trends and areas for improvement. Use your GreenPoint monitoring spreadsheet to help you keep track.
- Fit taps to oil drums or containers to allow oil to be dispensed into smaller containers in a controlled manner. Provide a drip tray under each tap and reuse the oil if it is uncontaminated.
- Train staff on handling oils. Poor handling leads to spills.
- Arrange for waste oil to be recycled. Recovered oil can be filtered of contaminants and reused as a lower grade oil.

Environmental control and innovation

- Waste
- Materials
- Energy
- Water
- Effluent
- Emissions
- Emergency Preparedness and Response

Waste

Waste must be controlled on site to ensure compliance with environmental legislation and to prevent pollution.

Putting an objective in place to reduce waste can save money on disposal costs, help you get better value out of the materials you use and save space on site.

Waste Management

The most important reason for putting waste controls in place is to ensure compliance with environmental legislation.

Do you remember the legal requirements for waste disposal set out in the EU Waste Directive?

It is a good idea to write a procedure or set of instructions that lists the legal requirements for waste. This will help everyone understand their responsibilities. Then carry out a site inspection to make sure the procedure is being followed.

Waste Control Activity

Imagine your colleague is carrying out an audit to check if the company is complying with waste legislation.

They have a list of legal requirements and need to find evidence for each one.

Can you help them with their audit by explaining how waste is managed on site?

Match the company procedure to the legal requirement, by clicking the relevant response.

Legal Requirement	Company Procedures for Waste Management
Waste must be managed without causing harm to humans or the environment	<ul style="list-style-type: none"> •We store waste in appropriate containers, to prevent waste escaping into the environment. •When storing light wastes, like cardboard and plastic waste, we use skips with lids to prevent the waste from blowing away. •We have a designated waste area that is clearly marked, so there is no confusion about what is waste and what isn't. •We carry out regular checks of the site to make sure waste is not escaping into the environment. •We arrange regular collections of waste to prevent it from building up on site and causing pollution.
Waste that is stolen and then dumped is still your responsibility and you could be prosecuted for environmental damage. How is waste kept secure?	<ul style="list-style-type: none"> •The site is fenced and has security cameras in place to deter thieves and vandals. •Skips stored outside the fence have lockable lids.
You must only pass your waste to, or have it collected by, an authorised person. Waste carriers should either be registered with the authorities or have an exemption.	<ul style="list-style-type: none"> •We ask all the waste carriers to provide a copy of their waste carrier's licence or record of exemption. •We would use a carrier that could not provide evidence of their registration or exemption.
Anyone who recycles, treats, stores, reprocesses or disposes of your waste must have a permit from the authorities.	We check that the sites are authorised to accept our waste by asking for a copy of their environmental permit, which we keep on file.
You must dispose of your waste using the best available option in the waste hierarchy.	<ul style="list-style-type: none"> •We have reviewed our waste and identified options to eliminate, reduce and reuse materials where possible. •We have arranged for a recycling collection, and now recycle 75% of our waste.
When waste is passed to a waste carrier or disposal site, both parties must keep a record of the transaction. This is usually referred to as a Waste Transfer Note or Hazardous Waste Consignment Note. Copies should be kept for 2 and 3 years respectively.	<ul style="list-style-type: none"> •When the carrier collects the waste they provide us with a waste transfer note or hazardous waste consignment note. We check that the note is correct, and both parties sign it. •We keep copies of Waste Transfer Notes for 2 years and Hazardous Waste Consignment Notes for 3 years.

Waste Hierarchy

Waste legislation also requires you to dispose of waste using the best option from the 'waste hierarchy'. The waste hierarchy is a list of the different ways you can manage your waste. The options towards the top of the waste hierarchy are better for the environment than those towards the bottom.

What do you think the best options for waste management are?

Drag and Drop the waste management options from the waste hierarchy onto the pyramid in the correct order.

- Eliminate
- Reduce
- Reuse
- Recycle
- Energy recovery
- Disposal

Using the Waste Hierarchy

Eliminate

Avoid creating the waste . Prevent the waste by ruling out the use of any unnecessary materials.

Reduce

Minimise what is thrown away. For example, if packaging cannot be completely eliminated, can it be reduced significantly?

Reuse

Using a product more than once. For example, using the packaging that comes with purchased materials to protect your own products.

Recycle

Using waste materials to make other products. It means that fewer natural resources are used to make new products.

Energy Recovery

If waste must be disposed of, incineration is the best environmental option as it generates energy.

Disposal

Landfill should always be the last resort as it has the most negative environmental impact.

Waste Segregation

Waste segregation means separating waste types into different bins before collection.

Hazardous waste must be segregated from non-hazardous waste by law.

However, it is also good practice to separate recyclable and non-recyclable wastes.

As an extra incentive, you may be able to negotiate a discount with your waste carrier if you segregate waste before it is collected.

Waste Segregation Activity

This factory has segregated its waste into 3 bins: waste for recycling, waste for recycling and hazardous waste. Drag the waste into the correct bin.

Recyclable Waste

Non-recyclable Waste

Hazardous Waste

Start Segregating

You can download this checklist for waste segregation and use it as an action plan.

- Set up recycling stations throughout your site
- Colour code and label the waste containers to ensure consistency throughout the site and to avoid confusion. Your waste contractor may be able to supply new bins if needed.
- Communicate the segregation scheme to your colleagues.
- Create waste signage and posters so it is clear what should be put in each bin.
- Carry out regular checks of bins to ensure that waste is correctly segregated.

Identifying Areas for Improvement

To get started walk around the site and make a list of all the waste that is being produced and how it is disposed.

Find out how much you are getting rid of and use your GreenPoint Monitoring Spreadsheet to help keep track of waste collections.

Ask yourself if there are any areas for improvement.

Reduce the Cost of Waste

If your company pays for your waste collections on a volume basis (e.g. per skip), try to reduce the volume of your waste.

What methods would you use to reduce the size of these waste streams?

Cardboard boxes – Flatten

Plastic packaging – Bale

Empty paint tins – Crush

Swarf (metal shavings) – Compact

Make the Most of Your Materials

- The Thiele GmbH & Co KG in Germany is a steel processing plant that manufactures round steel chains.
- When the company reviewed material consumption and waste, they identified that large amounts of raw material were being discarded.
- By reusing the raw material off cuts in the manufacture of other products, the volume of waste was significantly reduced.
- This project has achieved a cost saving of €12,820 per year.

Reuse of Solvents In Spain

A Spanish sign manufacturer of traffic signs and license plates recovers solvents so they can be used again.

The company uses a recycling system that uses distillation (heating liquids to separate those with different boiling temperature and enabling recovery) to recover solvents from their processes.

The used solvent is stored in a tank and connected to the distiller. The equipment heats the waste, evaporating the solvent, which then collects as cooled vapour in a tank.

The system recovers 50% of the solvent, which can be used again as a work-tools cleaner, reducing the amount of raw materials purchased and the amount of hazardous waste produced.

Making the Most of Your Resources - Swarf

- Swarf is metal waste that is considered hazardous when contaminated with oil. Swarf can be sold on to a foundry or recycler and can be quite valuable. Reducing the cutting fluid content of swarf increases the value.
- Dry machining techniques are available and have eliminated the need for cutting oils.
- Gravity drainage. When swarf is in a bin the cutting fluid naturally drains to the bottom. Use a bin with a tap to drain the fluid. Shovelling swarf from the bin instead of tipping it out keeps it drier.

The Grumbler (***)translation – someone that resists change in the workplace and moans about it***)

The Grumbler resists change and moans about anything new in the workplace. You'll need to convince them of the benefit of environmental innovation. Here are some responses to their complaints, if you choose the right ones you can convince them to help!

G: It is too difficult to get everyone to segregate their waste

A: We are used to segregating waste at home; it will only take a short meeting to explain how to do it at work

G: Who is going to take charge of this – no one has the time

A: We can share the work. If we nominate a Waste Champion in each area of the business, they can check the bins in their department and encourage their colleagues to segregate waste

G: We haven't got space for all these extra bins

A: If we segregate the waste, each bin can be smaller and if we get a waste compactor for the cardboard packaging then the cardboard will take up less space!

G: This is going to cost us more money

A: Actually, by offering to segregate waste on site, I've managed to negotiate a cheaper waste contract

G: If we reduce the packaging on our products they may get damaged.

A: You're right; we'll have to think very carefully about this. You know most about the packaging of the product and are good at solving technical problems, would you be able to investigate this?

G: I am quite good at that sort of thing – yes, I'll see what I can do.

Environmental control and innovation

- Waste
- Materials
- Energy
- Water
- Effluent
- Emissions
- Emergency Preparedness and Response

Energy Efficiency

Gas and Electricity consumption contributes to the global issues of resource depletion and climate change. The price of gas and electricity is also growing every year.

However businesses can quickly cut their energy bills by 10% or more without any investment. With a little investment savings of 20% are realistic and some companies have even cut their energy costs in half!

Complete an energy audit and implement the top tips in this section of the course to reduce energy consumption in your business.

Energy Audit

An energy audit can help your organisation to reduce its energy consumption.

The purpose of an energy audit is to identify an organisation's sources and uses of energy and measure its consumption. The best way to do this is to walk around the premises and site.

Start measuring energy consumption e.g. use meters, bills and invoices. Checking meters regularly will give a more accurate picture. Use your GreenPoint Monitoring Spreadsheet to help with this.

Energy Audit

Click on all the sources of energy consumption in this business.

- Lighting
- Computers and Photocopiers
- Air conditioning
- Heating
- Machinery
- Forklift Trucks
- Heating

Adapt Your Energy Supply To Your Needs

- In many companies, the energy supply systems are not adapted to the actual needs, and too much energy is consumed.
- Karl Friedrich GmbH is a modern steel, rolling mill and hammer mill in Remscheid, Germany.
- While participating in an energy consultancy project it was found that the company was using a large steam generation plant that was bigger than required.
- The company installed a smaller plant, appropriate to their activities and turned off the large steam generation plant.
- The company reduced energy consumption and significantly reduced fresh water consumption resulting in cost savings of €23,000 per year.

As well as making sure your energy supply is fit for purpose you can increase the energy efficiency of your business by making improvements to:

Lighting

Motors

Heating and Cooling

Compressed Air

Reduce the Cost of Lighting

Click around the site to reveal tips for improving the lighting. These suggestions can be downloaded as a checklist.

- Switch off lights in empty rooms - especially at the end of the day. This can save up to 15% of your lighting bill.
- Use daylight It's free - so keep windows and skylights clean and clear.
- Use energy efficient light bulbs which can save 50% on energy costs, including the cost of the bulbs.
- Consider installing time switches, movement sensors and daylight linked controls in rooms that are not regularly used.
- Replace dim, flickering or failed lamps, preferably with more efficient alternatives. Update fittings and controls
- Raise awareness. Motivate staff to switch off lighting when it is not needed.
- Consider installing banks of lighting so that not all lights need to be on if only one area of the workshop is in use.

Change Your Lighting, Reduce Your Bills

Car manufacturer Peugeot, sells 6000 new cars and 5000 second hand cars a year.

Peugeot has recently made environmental improvements at one of its sites in France. The company set up a lighting system that includes movement and brightness sensors for corridor lighting and has reduced energy consumption by 10-15%.

Peugeot has also implemented:

Rapid opening/closing doors to prevent loss of heat

Rainwater recovery from the roof is used in the carwash

The site now consumes 44% less energy than other sites of a similar size.

Reduce the Energy Use of Motors

Motors are everywhere in industry and business. They power almost everything, from pumps and fans to compressors.

They use a lot of energy.

However there are changes you can make to improve the efficiency of your motors.

Energy Saving - Motors

- Keep them maintained - a badly maintained motor and drive system can add 5% or more to your energy costs.
- Replace with higher efficiency motors. Always specify high-efficiency motors (HEMs). They rarely cost more but use 3-5% less energy.
- Consider implementing automated process control systems to manage motor speeds. This can save up to 15% of a process' running-cost.
- Supervise running time - check for motors (fans, pumps, etc.) that are running when they are not needed. A motor running without load can still use as much as 40% of the full load power. Turn motors off when they are not needed.
- Check the alignment of gears and other linkages. Even a small misalignment will reduce system efficiency by several percent — costing you money.

Energy Saving - Motors

Variable speed drives

- One of the best ways to save energy with motors is to fit variable-speed drives (VSDs) to units that need to operate at a range of speeds.
- It can waste energy to drive every motor at the maximum speed all the time. VSDs enable the motor to be driven at different speeds in order to match the load required by the equipment.
- Lowering the speed of a motor by just 20% can save up to 50% in energy. A single VSD may be used to control several motors at once.

Are you thinking of replacing a piece of equipment?

Many types of motor-driven equipment are now available with built-in VSDs. If you are replacing a piece of equipment this may be a more efficient option.

Energy Saving - Compressed air

Compressed air has many uses in the automotive and metals industry including:

- Pneumatics, the use of pressurized gases to do work e.g. pneumatic screwdriver.
- Surface finishing processes e.g. polishing, sanding, and buffing.

Over 10% of electricity supplied to industry is used to compress air. However, as much as 30% of this energy is lost through leaking systems.

Energy Saving - Compressed air

- Conduct a regular leak test and repair leaks as soon as possible.
- Finding and repairing leaks can save you money e.g. A 3mm hole could cost over Euro 1,000/year in wasted energy and while repair costs vary, payback periods are generally within a year.
- Lower the operating pressure - Don't compress air to pressures higher than necessary. Check the requirements of your equipment and tools and set the system pressure to the minimum needed. Typically a reduction of 1 bar (15psi) will save around 7% of the energy.
- Turn compressors off when they are not in use.

Read more – [How to check for leaks](#)

Compressed Air – Read More

The main ways of checking for leaks are:

- Run the compressor without using any air tools or equipment. Walk slowly around the system and listen for hissing sounds - that's the air escaping.
- Run the system without using air tools or equipment. Make a simple solution of soapy water and apply the solution to all pipework (especially joints). Look to see where it bubbles up, indicating a leak.
- Hiring or purchasing ultrasonic leak detection equipment from the compressed air system supplier.

Space Heating and Cooling

One of the biggest opportunities for reducing energy consumption is by improving heating and cooling processes.

Heating, ventilation, and air-conditioning processes, known sometimes as HVAC, are energy and carbon intensive. The price of electricity for ventilation and cooling, and the price of gas and heating oil used for heating increases every year.

Click around the site to see where you can reduce costs while maintaining staff productivity and comfort.

Heating and Cooling Top Tips

- Close windows and doors when heating or air-conditioning is on
- Different parts of a building are often at different temperatures. Instead of adjusting the temperature controls try moving employees to where they would be most comfortable.
- Try to avoid the using portable heaters and fans, they use a lot of energy.
- Turn off heating and cooling in unoccupied rooms
- Use timers and heat activated sensors to automatically turn off heating and cooling systems when not in use
- Make sure radiators are unobstructed
- Fix draughts – they let warm air out in winter and cool air out in summer!

Environmental control and innovation

- Waste
- Materials
- Energy
- Water and Effluent
- Emissions
- Emergency Preparedness and Response

Using Water Efficiently

Water is an increasingly expensive resource with mains, sewerage and trade effluent charges all rising.

Reducing your water consumption is one of the easiest and most inexpensive ways of achieving cost savings.

Many companies can achieve a 20-50% decrease in the amount of water used through implementing water minimisation measures.

Identify all the processes in your organisation that use water, regularly monitor water use and see if any of the Water Top Tips can reduce water consumption in your organisation.

Monitoring Identifies Expensive Problem

In one case, water monitoring at a manufacturer highlighted an operational problem that was caused by an increase in water consumption that cost the company an extra €840 per day.

Monitoring records showed an increase in consumption, highlighting the problem, which was fixed in three days.

If the company had relied on water bills for monitoring, the fault might have gone undetected for four months.

By then, the fault would have cost the company over €90,000. The problem was identified because the company monitors its consumption of water and other utilities carefully.

Water Efficiency

Two free and easy ways to save water are:

- Train staff to use water more efficiently
- Check equipment regularly and repair leaks as quickly as possible
- Make sure water is not left running
- Switching to a process that doesn't require water:

GSG in Germany has developed a method for the mechanical cleaning of alloy steel wires, as an alternative to wet chemical cleaning with soap drawing. This reduces water and chemical consumption as well as effluent. Could you use mechanical cleaning methods instead of solvents and water?

Increasing Water Efficiency

You can also use flow meters to control how much water is entering your systems. Flow meters are not free to install but they can help make significant savings.

An electroplating company reduced its water consumption by nearly 60,000 m³ per year, making a saving of almost €53,000 per year.

They achieved the improvement through good housekeeping and using flow restrictors to reduce water use significantly without any major modifications. The payback period (how long it took the savings to pay off the initial investment) was 6 months.

Effluent Control and Improvement

Effluent can also cause serious pollution incidences and is closely regulated by the authorities.

To avoid pollution incidences and prosecution it is important to control the effluent from your business and not allow it to escape into the environment.

Just a note – when we talk about effluent in business, we are only talking about process effluent, not waste water from kitchens and bathrooms.

Effluent Control

Effluent (waste water) cannot be released to drain without consent from the authorities.

This means that one of the most important elements of effluent control is knowing where the effluent goes when it leaves your site.

Unless you contain it and have it removed as liquid waste, most effluent goes into the drainage system.

There are two types of drain:

- foul water (also known as sewers)
- surface water

Effluent Control

Foul-water drains carry contaminated water (sewage or trade effluent) safely to a sewage treatment works.

The surface water drains lead directly to streams and rivers. They should only carry uncontaminated rainwater, otherwise the streams and rivers will become polluted.

Click the buttons to see where your effluent should go to:

- Plating plant
- Machine shop
- Gutters
- Car park

Get a copy of the drainage plan for your site and find out where your drains lead. This is important because your drains might be connected to the wrong system. Wrongly connected drains and effluents can cause severe pollution.

Effluent Savings

When the authorities give you consent to discharge foul water, the cost is based on how contaminated the water is and how much you produce.

The worse the contamination and the more effluent you produce, the higher your bills will be.

Highly contaminated effluent also takes more resources to clean up and poses a higher pollution risk.

For these reasons, it is best to reduce effluent wherever possible. It saves money and reduces the environmental impact.

Achieving Effluent Improvements

Where should we start?

To improve effluent management on site, start by mapping all the water consumption and all the effluent produced on site.

Then...

- Implement improvements where you can e.g. installing water saving devices like flow meters or training staff to use less water
- Monitor the results of the change
- Communicate successes and savings to employees

Effluent Efficiency Case Study

The use of ion exchange technology to treat effluent from a company's electroplating shop allowed the water to be reused in a closed loop system. The company saved €120,000 in the first year alone. Water consumption fell by 89% and the payback period was less than 16 months.

Effluent – Focus on Plating Activities

- Do you have plating activities on site? Yes/No
- No – OK move on to the next section
- Yes – Here's some information to reduce chemical consumption and effluent from plating activities.
- In a plating plant items are treated in solution and then lifted out and are held above the treatment vat for a short time, before being moved for the next stage of the process. 'Drip time', when the item is suspended above the vat, allows process solution to drain from the item being treated. Extending the drip time from 15 seconds to 30 seconds increases the amount of electrolyte solution returned to the plating solution by 50%. This saves money as lower quantities of plating solution are purchased and it reduces the contamination of effluent when the item is rinsed.
- Use the minimum amount of chemical required for the job to minimise the contamination of the effluent.
- Rinsing item in a plating plant uses a great deal of dilute solution or clean water. Often a continuous stream of water is used for rinsing. Spray systems or manually operated trigger hoses are effective rinsing methods but use less water, save money, reduce effluent and cut costs.
- Many methods are available to recover metals and remove contaminants from plating baths including ion exchange and filtering. Recover the metals, sell them on and recover some of your costs!

Water Efficiency and Effluent Control – Focus on Vehicle Washing

Whether you're cleaning just one vehicle or responsible for a large lorry fleet, you must arrange for collection and disposal of effluent to prevent pollution. It's illegal to discharge trade effluent to the environment or into drains without permission. Most drains around buildings and car parks are surface water drains – the foam and dirt from the vehicle washing will run straight into the nearest river or stream.

Why is washing vehicles so bad? [Click for more information](#)

Environmental Impact of Vehicle Washing – Read More

- Effluent and run-off from vehicle washing and cleaning activities can damage the environment and pollute rivers, streams and groundwater.
- Dirt, brake dust, traffic film residue and oil that is washed off are all pollutants.
- The cleaning agents you use (including those labelled biodegradable or traffic film removers) are very poisonous to river life.
- It is a criminal offence to cause pollution, avoid it by following the Top Tips for Vehicle Washing

Water Efficiency and Effluent Control – Focus on Vehicle Washing

Follow these top tips to reduce the environmental impact of washing and cleaning vehicles, plant, machinery, equipment:

- Use a nearby commercial vehicle wash facility that has effluent control in place already.
- Use washing equipment that reuses water.
- Only use biodegradable washing and cleaning products and use the minimum amount required.
- Washing activities that produce run-off from the vehicle onto the ground should be carried out in areas that are clearly marked and isolated from surface water drainage systems and porous ground. Mark out the area as the designated washing bay.
- Design washing bay so that effluent is prevented from escaping into the environment
- Direct effluent into a silt trap or settlement tank to remove larger particles of silt and sediment
- Collect the effluent in a sealed system and reuse
- Discharge effluent to the public foul sewer (with prior permission from the regulator)
- Collect effluent in a sealed system and dispose of as liquid waste

Environmental control and innovation

- Waste
- Materials
- Energy
- Water
- Effluent
- Emissions
- Emergency Preparedness and Response

Air Emissions Management - VOCs

- Many chemical substances which are used to dissolve or dilute other substances and materials are solvents. We rely on solvents for many tasks including cleaning and degreasing machinery and surfaces and working with coatings and paints.
- Solvents are a major source of Volatile Organic Compounds (VOCs). Unless they are controlled VOCs are emitted into the air once the solvent has been applied.
- VOCs react in sunlight, producing an air pollutant known as “ground-level ozone.” High concentrations of ground-level ozone seriously affect human, animal and plant health. They can also harm building materials, forests and crops.

Air Emissions – Reducing VOCs

You can minimise emissions of volatile organic compounds from activities by managing our solvent consumption.

Reduce or eliminate the need for solvents in your operations:

- Use water for cleaning instead of solvents. Clean water at 80 – 90 °C can remove the majority of oil and grease from components, without the use of any chemicals
- Remove most of the oil or grease with dry rags or paper so you need less degreaser
- Try using mechanical cleaning such as power wire brushing or shot blasting
- Use alternative solvents that are less hazardous
- The area should be ventilated for health and safety reasons but avoid unnecessary drafts where possible as these encourage evaporation of solvents.
- Store solvents in covered containers to prevent evaporation
- Try using a pump to disperse solvents instead of pouring, it minimises evaporation

Do You Use a Vapour Degreaser Unit?

- Minimise the VOC emissions by removing components from the unit slowly - ideally less than 3 metres per second.
- Upgrade to a Low-Emission Vapour Degreaser - this completely sealed unit prevents the solvent emissions escaping.

Air Emissions - Dust

- Most companies use Local Exhaust Ventilation (LEV) to remove fumes and dust from the workplace.
- Sweep up or collect the dust and dispose of it in a bag to prevent it from escaping into the environment.
- Make sure LEVs are maintained and functioning properly.

A Spanish manufacturer of trimmings and metal fittings clothing has improved dust management in the workshop.

The company replaced the mobile aspirators located at the filing machines by a workplace extraction and central vacuum system.

The system collects dust from the grinding operations in different parts of the facilities, and directs it to a central bin, emitting clean air outside, after having circulated it through a series of filters.

Vacuumed particles are absorbed and directed by forced air towards a central silo, where they are collected. At the entrance of the bin are located intermediate filters to capture these particles.

The new system has significantly decreased the amount particle emissions from the company and ensures compliance with legal limits.

Furthermore, this system avoids the movement of dust in the work area, since the extracted and filtered air is released in a dedicated area. As a consequence, dust has been virtually eliminated, improving the environmental conditions of employees.

Environmental control and innovation

- Waste
- Materials
- Energy
- Water
- Effluent
- Emissions
- **Transport**
- Emergency Preparedness and Response

Transport Improvements

- What can I do to reduce car pollution? Download this checklist to help minimise the impact of business travel.
- Avoid using cars for short journeys – combine trips or, alternatively, walk, cycle, or take a bus.
- Care for your vehicle, regular servicing helps keep cars efficient and saves fuel.
- Remove unnecessary weight e.g. Roof racks, it increases fuel consumption.
- Drive gently – racing starts and sudden stops increase fuel consumption. Use higher gears when traffic conditions allow.
- Steady your speed –emissions are lowest at around 50mph (80 kph) , they are much higher above 70mph (110 kph).
- Switch off when stationary
- Reduce the volume of car stereos and avoid sounding the horn or revving the engine
- Air conditioning and on board electrical devices increase fuel consumption – only use them when really necessary.
- Going to a meeting at another site? Car share with other people going to the meeting
- Investigate new, more efficient vehicles and alternative fuels
- Encourage colleagues to use public transport or offer an incentive to cycle or walk to work
- Review business travel – is it always necessary? Could you hold a meeting via video conferencing instead to avoid travelling?

Environmental control and innovation

- Waste
- Materials
- Energy
- Water
- Effluent
- Emissions
- Transport
- Emergency Preparedness and Response

Emergency Preparedness and Response

Can you think of any environmental emergencies or incidences that could occur in your workplace?

Headline News

Company X Causes <learner emergency>

Environmental emergencies can cause
irreparable damage to the environment and
your company's reputation.

Storage of chemicals and oil

Poor storage of oils, chemicals and other materials is a major risk to the environment. Emergency preparedness starts with good housekeeping.

- Plan your storage so it's designed, sited and maintained to protect the environment.
- Consider protecting materials from extremes of temperature and weather that could damage your storage and cause pollution.
- If you're storing flammable substances, check how close your planned storage is to sources of ignition.
- Store materials in secure buildings where possible to prevent theft.
- Use secondary containment systems to catch any leaks.

Storage of chemicals checklist

Use this checklist to regularly inspect your chemical storage. This checklist is included in your GreenPoint toolkit.

- Are storage facilities damaged or corroded?
- Is there any evidence of leaking?
- Is there any damage to pipework?
- Are the storage areas secured from vandalism and theft?
- Are storage containers fit for purpose and clearly labelled with the type of product, maximum capacity and information on health and safety and environment protection?
- Are incompatible chemicals stored separately so they can't react with each other
- Do your storage tanks have an impermeable secondary containment that can hold at least 110% of the tanks maximum capacity?
- If you have underground storage tanks do you have good leak-detection facilities and maintenance and emergency procedures to reduce the risk to groundwater?

Using Chemicals Efficiently and Safely

Chemicals can be dangerous to health and the environment.

Chemicals are provided with a Material Safety Data Sheet that details the correct way to use the chemical and the potential health and environmental impacts.

Always use chemicals in line with the instructions provided by the manufacturer for your health and safety.

Use the smallest amount of chemical required for the operation and investigate the use of less hazardous alternatives.

Emergency Preparedness

Do you remember the Pollution Risk Analysis we completed in Module 2? It weighed up the severity and likelihood of a pollution incident (which is a type of environmental emergency).

Use the same system to review all other environmental emergencies that could happen on your site, including:

- Spill
- Flood
- Fire
- Explosion

Then put procedures in place to minimise the environmental impact of the emergency.

Focus on Spill Preparedness and Response

- Many different materials can cause environmental harm if they're spilt and enter the environment. It's better to stop a spill happening than to have to clean up afterwards.
- Polluting materials from your business may include: chemicals, oils, powders, paint and detergents.
- Remember, you have already paid for these materials and if you spill them you are losing money. And that's before you pay for the clean-up!
- Safe and legal material storage with appropriate environment management procedures is the best way to prevent a spill. Use the chemical storage checklist provided in the GreenPoint toolkit to check your chemicals are secure.
- Make sure your site has stocks of pollution control equipment 'spill kits', suitable for your stored materials, readily available and where possible stored near possible spill sites.

Focus on Spill Preparedness and Response

Prevent spills happening in the first place. Safe secure storage, careful deliveries and staff training, on site and for drivers, are essential for pollution control.

What are the common causes of spills?

- overfilling or poor handling of storage containers
- damaged or leaking storage containers;
- equipment failure;
- failure of underground tanks or pipework;
- a collision or accident during transport or delivery;
- weather related problems, including flooding, wind damage or extremes of temperature;
- fires or explosions;
- deliberate acts of vandalism or theft

Focus on Spill Preparedness and Response

Draw up a plan for spill response and display it in high risk areas. Your plan should include:

- Contact details for management
- How to clean up after a spill
- How to legally and safely dispose of the spilled substance and clean up materials
- Contact details for clean-up contractors.

Spill Response Procedure

Emergency! A spill has occurred on site!

A small barrel of oil has tipped over in the car park and is spilling its contents onto the ground.

You must respond immediately.

What action will you take to minimise environmental damage?

- Stop the spill – pick up the barrel and put the lid back on if it is safe to do so
- Contain the spill – Stop the spill from spreading by using spill kit materials (e.g. absorbent pads) and cover any nearby drains
- Notify management
- Clean up the spill
- Dispose of the clean up materials as hazardous waste
- Replenish spill kit materials to prepare for future incidences
- Record the incident
- Investigate the cause of the incident

Excellent! You responded quickly and prevented a pollution incident. You can use this activity to train your colleagues on effective spill response. Find it in your GreenPoint Toolkit.

Environmental Emergencies – The Aftermath

After any environmental emergency or incident, you should carry out an investigation.

Identify:

- What happened
- How it happened
- How well did staff respond and follow the emergency procedure
- Did the plan work? what went well and what didn't?
- What was the environmental and business impact of the emergency?

The aim is to find out the cause of the incident so you can prevent it from happening again.

Sustainable Premises

If you are moving sites or have the opportunity to build a new premises that is designed for your company, follow Toys Motors example and plan for a sustainable premises.

The distribution group Toys Motors opened a new factory in Aytré in 2010.

They modified an existing factory in line with the criteria of the British Sustainable Buildings Standard BREEAM.

The building design includes:

- Photovoltaic panels that produce three times the amount of energy consumed
- Energy efficient lighting that reduced energy consumption of the hall lighting by 40%
- Natural ventilation and insulation – no air conditioning
- Minimal consumption of fossil fuels are used for heating
- The building insulation wadding is made from cellulose made up of 85% recycled newsprint and 15% other biodegradable products
- 70% of the water supply come from collecting rainwater and is used in the carwash and bathrooms
- 80% of the wood structure supply coming from eco-managed forests
- The asphalt used in the car park is made from 2000 tonne of recycled aggregates rather than virgin resources
- All waste on site is recycled where possible
- Green waste is composted
- The construction reused as much of the old building as possible, including fence posts and miscellaneous materials, processing and maximum recycling of all wastes on site.

The Stats – Toys Motor's Reductions

- 72% reduction in energy consumption per m²
- 50% reduction in water consumption per vehicle
- 29% reduction in water consumption per employee
- 100% reduction of NO_x emissions per year
- 100% green electricity generated by solar panels, making up > 16 tonnes of CO₂ per year

Are there any improvements you will try to make in your organisation based on this course? Write them here and you will be able to download it and keep it as a reminder:

Sustainability

This course aims to encourage sustainable business practices for companies in the metal and automotive sector.

It is likely that you will have seen the word Sustainability a lot in recent years. Since the mid 1990's it has become a buzz term.

So what does this mean?

Sustainability is the idea that the whole of Earth's population can thrive within the limits of us only having one planet. At the moment, the average person in the UK places such a burden on the planet that - in terms of resources (energy, water, materials) - if everyone in the world lived like us we would need 3 planets to survive. On the other hand, many people in the world go without clean water and do not have electricity. Clearly this is not sustainable.

Sustainability

Sustainable Development

A report published in 1987, called Our Common Future, described Sustainable Development as: “Development that meets the needs of the present without compromising the abilities of future generations to meet their own needs”.

Put in simple terms, the actions we take today should not place future generations at risk. E.g. Overconsumption of fish stocks or energy supplies now could mean that future generations struggle to have enough affordable fish or energy to satisfy their needs.

Sustainability

One way to look at sustainability is to think of it as a 3-legged stool. The 3 legs represent the economy, society and the natural environment.

If each of the three 'legs of the chair' are balanced then sustainable development is achieved and the chair stands. However if we focus too much on one of the spheres of 'society' 'environment' and 'economy' then the chair will be off balance and sustainable development will not be achieved.

It would be inaccurate to say that the 3 pillars have to be perfectly balanced in everything we do. But we at least have to consider the impacts of our business on both society and the environment, as well as financial success.

Think about your business, is one leg shorter than another?

Further Training and Support

Has the course given you some ideas for environmental improvement in your business?

Would you like more training or funded support?

Funding

Funding may be available to improve the environmental performance of your business.

Funding comes in the form of grants and subsidies and either covers the full cost or a percentage of the cost of the improvement.

Funding may be available for training, upgrading equipment, investing in renewable energy technology or business support.

Funding

- What would you use funding for?
- A technical improvement e.g. installing more efficient lighting
- Update old equipment with new, more efficient models
- Invest in renewable energy - we're installing solar voltaic panels on the roof of the workshop
- Get support from a consultant to implement an environmental management system
- I have loved this course so much I am going to do more environmental training

Further Training

- Environmental training ranges from introductory environmental awareness courses (like this one) to higher level and technical environmental training courses.
- For more information on environmental training, contact the trade association for your industry and the national professional institute or association for environmental management. They may be able to recommend the best training courses for you.
- To build on the knowledge you have gained in the GreenPoint course look out for training on the following topics:
 - Environmental Management Systems Training
 - Internal Environmental Management System Auditor Training
 - Pollution Prevention and Response Training
 - Waste Management Training

Sources of Funding

*****Partners – Please Add Further Information in Your Own Language with a brief summary in English***

- Please provide links to national or local funding providers that fund environmental training/renewable energy initiatives/business support e.g. consultancy to help implement an environmental management plan/purchase of new equipment.
- Consider that this course will be in the public domain for some time, so it is best not to include any funding streams that you know will be cancelled in the next year.
- If you do not know of any relevant funding streams. Please write 'none available' and we will remove this page from the course.
- English example:
- In the UK there are various grants, subsidies and low-interest loans available to help with environmental improvements. A summary of the schemes is available on the Green Wise Business website: <http://www.greenwisebusiness.co.uk/resources/green-grants-and-funding-16.aspx>

Course Evaluation

Congratulations on completing the GreenPoint course.

Just before you get your certificate please complete this short evaluation questionnaire. Your feedback will help us to improve this course.

Please rate each of the following statements:

This online course was easy to use

5 - Strongly agree

4 - Agree

3 - Tend to agree

2 - Tend to disagree

1 - Disagree

0 - Strongly disagree

I enjoyed this course

5 - Strongly agree

4 - Agree

3 - Tend to agree

2 - Tend to disagree

1 - Disagree

0 - Strongly disagree

This course has improved my understanding of environmental issues

5 - Strongly agree

4 - Agree

3 - Tend to agree

2 - Tend to disagree

1 - Disagree

0 - Strongly disagree

I can use what I have learnt to improve my company's environmental performance

5 - Strongly agree

4 - Agree

3 - Tend to agree

2 - Tend to disagree

1 - Disagree

0 - Strongly disagree

Do you have any other comments?

Thank you for completing the evaluation.

Click the button to download your certificate and either save or print a copy.

In the GreenPoint toolkit you will find resources to help you minimise the environmental impact of your company and encourage environmental innovation.

Visit the GreenPoint LinkedIn Group for more ideas and environmental discussion.

Certificate of Completion

Date

Environmental Awareness Online Training

When you have finished the course and downloaded your certificate please complete [this assessment of competence](#)