



# LEVEL 3 AWARD IN ESG LEADERSHIP

## TRAINER

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IRCA Approved – Trainer for ISO 14001&45001

# Environmental Awareness & Waste Management Training

## Contents -

- ▶ Introduction
- ▶ Benefits of EMS ( ISO 14001)
- ▶ Sources
- ▶ Handling
- ▶ MSDS
- ▶ Labelling
- ▶ Storage
- ▶ Incident reporting



# Introduction

- Your Name
- Your Designation
- Your Experience

# Introduction

ISO  
International Organization for  
Standardization

## ISO 9001 and ISO 14001 & 45001

- ▶ ISO 9001 and ISO 14001 are among ISO's most well known standards ever.
- ▶ They are implemented by more than a million organizations in some 175 countries.
- ▶ ISO 9001 helps organizations to implement quality management.
- ▶ ISO 14001 helps organizations to implement environmental management.
- ▶ ISO 45001 helps organizations to implement Health and Safety management.

# Quality management

- ▶ ISO 9001 is for **quality management**.
- ▶ **Quality** refers to all those features of a product (or service) which are required by the customer.
- ▶ **Quality management** means what the organization does to
- ▶ ensure that its products or services satisfy the customer's **quality requirements** and
- ▶ comply with any **regulations** applicable to those products or services.

## Quality management (cont.)

- ▶ Quality management also means what the organization does to
- ▶ enhance **customer satisfaction**, and
- ▶ achieve **continual improvement** of its performance.

# Environmental management

- ▶ ISO 14001 is for **environmental management**. This means what the organization does to:
- ▶ minimize harmful effects on the environment caused by its activities,
- ▶ to conform to applicable **regulatory requirements**, and to
- ▶ achieve continual improvement of its **environmental performance**.

## Health and Safety management

- ▶ ISO 45001 is for **Health and safety management**. This means what the organization does to:
- ▶ **Maintain zero Accidents and ill health caused by its activities,**
- ▶ to conform to applicable **regulatory requirements**, and to
- ▶ achieve continual improvement of its **Health and safety performance**.

# Management systems

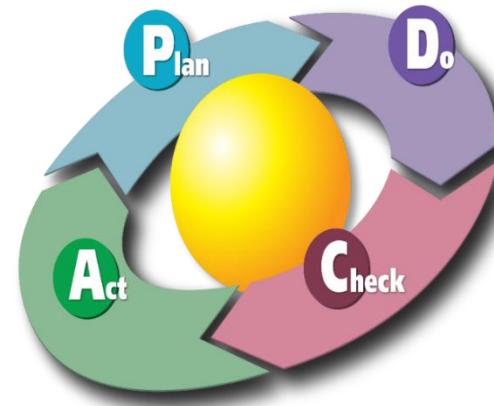


**GLOBAL SAFETY STUDIES**  
Safety Training & Consulting

- ▶ **Management system** means what the organization does to manage its processes, or activities in order that
- ▶ its products or services meet **the organization's objectives**, such as
- ▶ satisfying the **customer's quality requirements**,
- ▶ complying to **regulations**, or
- ▶ meeting **environmental objectives**
- ▶ meeting **Health and Safety objectives**

# ISO CLAUSES

1. Scope
2. Normative references
3. Terms and definitions
4. Context of the organisation (P)
5. Leadership (P)
6. Planning for the management system (P)
7. Support (P, D)
8. Operation (D)
9. Performance evaluation (C)
10. Improvement (A)





# HSE BASICS

# Definitions

- ❖ **Safety** - absence of risk of serious personal injury
- ❖ **Health** – Freedom from illness/ absence of disease
- ❖ **Environmental Protection:**  
Prevention of damage to air, land & water





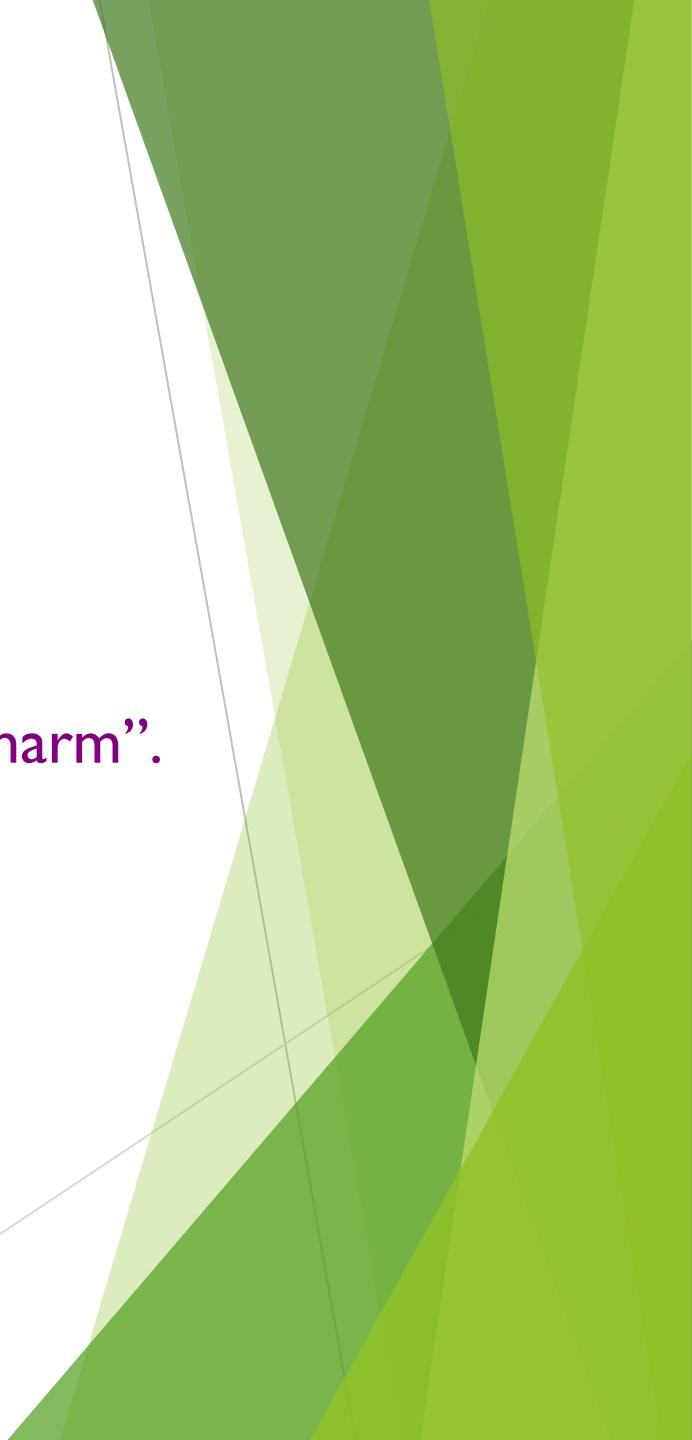
# Definitions

## Accident

An Unexpected or unplanned event that resulting injury to person or damage to property or Both.

## Near Miss

An unplanned event that did not resulting injury to person or damage to property but it has potential to do so.



# Definitions

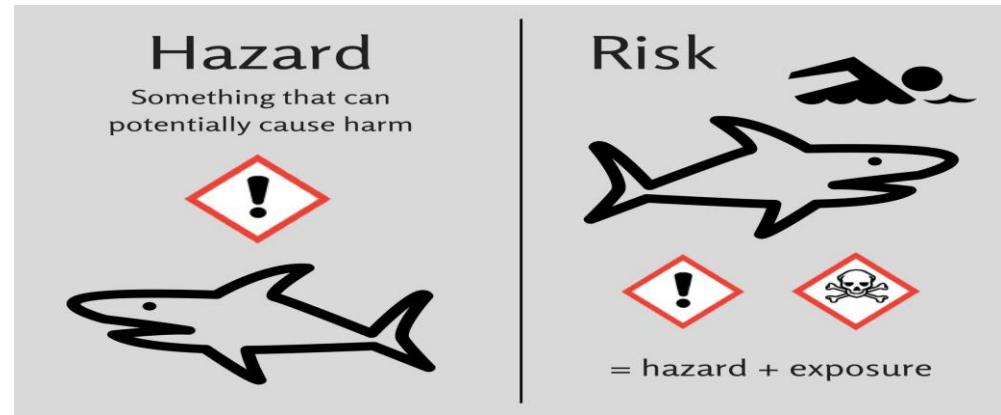


**Hazard** “Something with the potential to cause harm”.

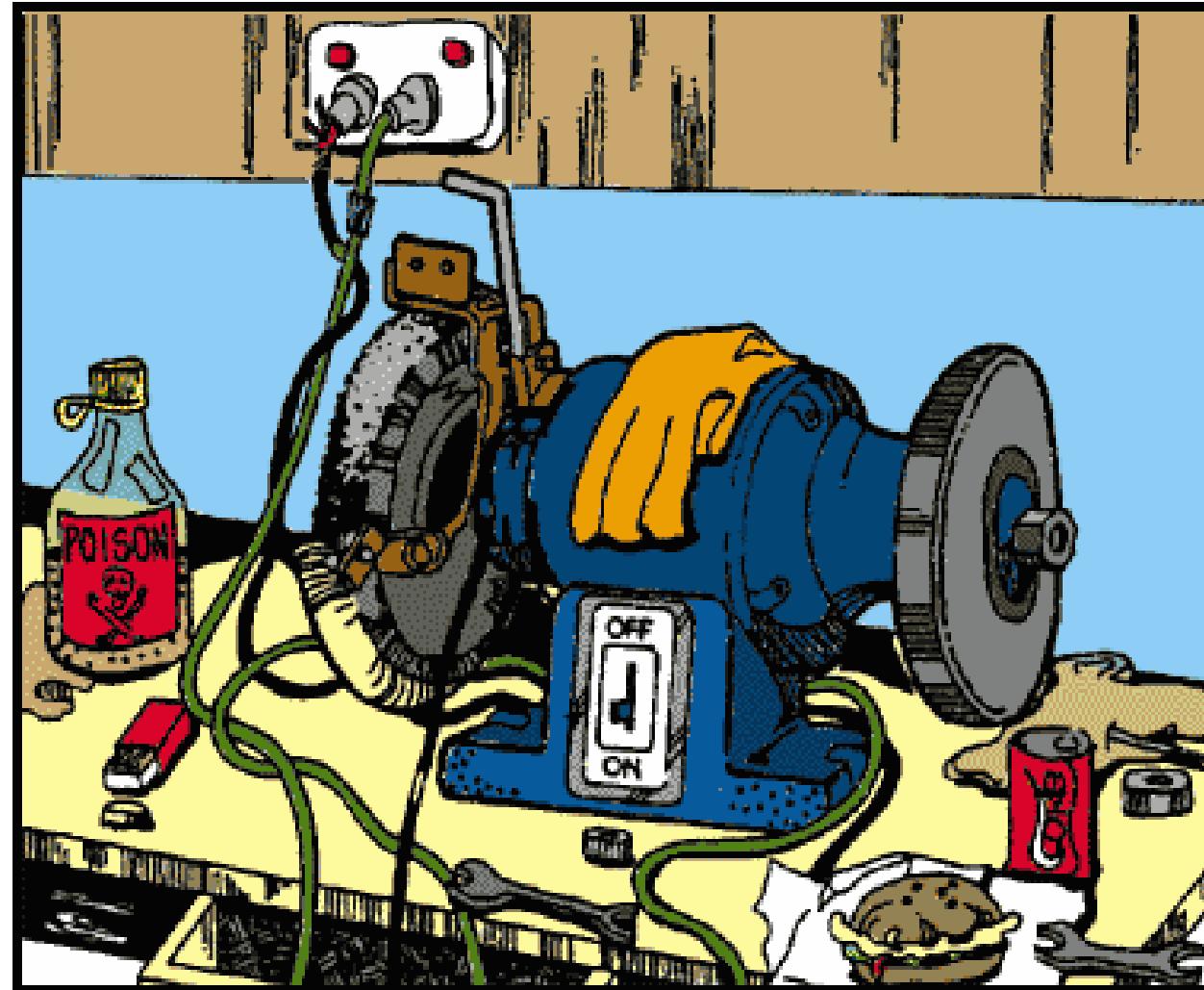
- Example : Noise, Vibration , Chemicals, Radiation

# Definitions

- **RISK** = Combination of Probability of harm and severity of Harm
- **RISK** = P X S



# Exercise 1- Hazard Identification







# The Cost of Accidents at Work

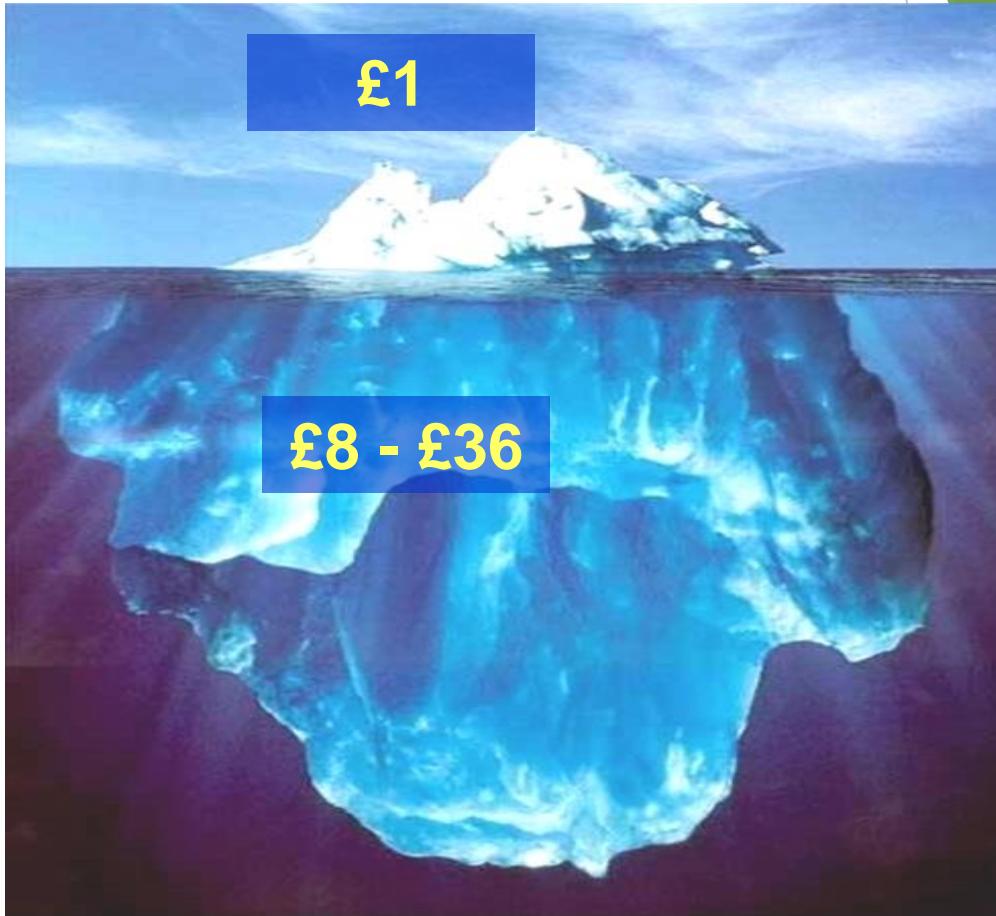
Direct & Indirect costs of an Accident.

## ***Direct Costs of Accident:***

- Fines & Penalties
- Medical costs
- Sick pay
- Compensation
- High insurance premium

## ***Indirect Costs of Accident:***

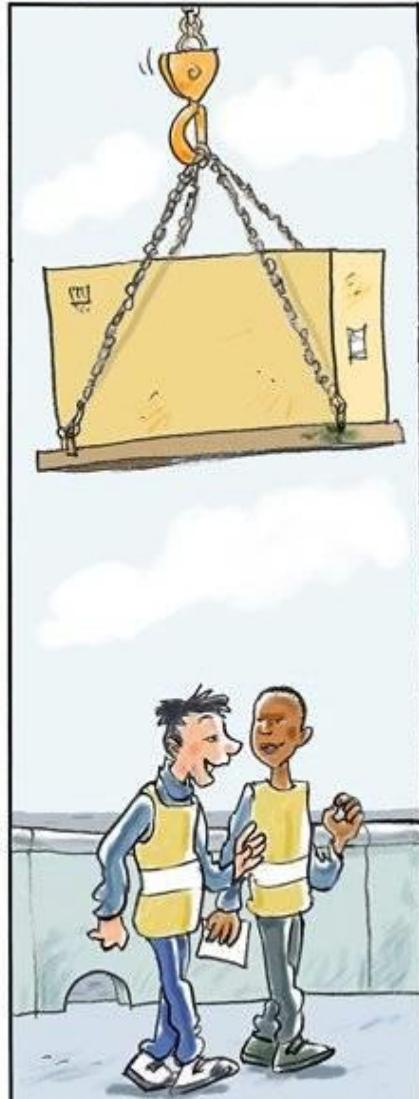
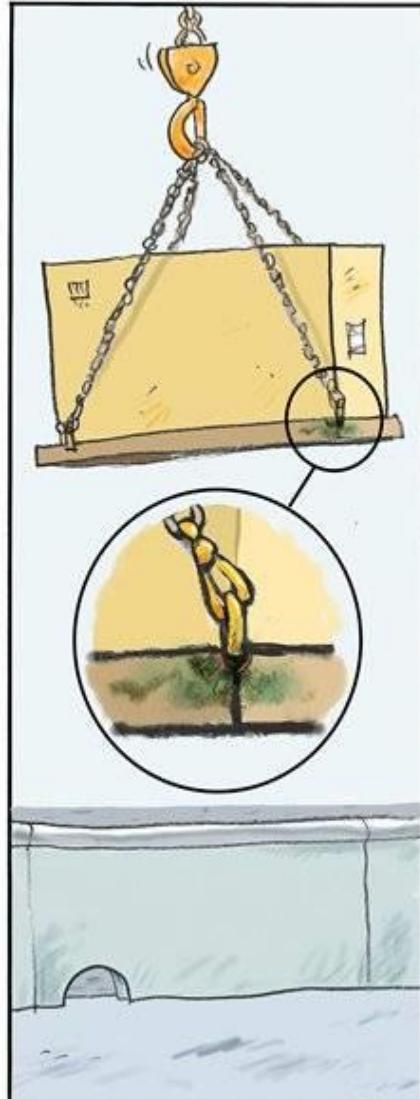
- Delays to production following the accident
- Lost time for investigation
- Lost morale and damaged worker relationships
- Cost of recruitment of replacements
- Lost reputation
- Damage to the environment (e.g. from chemical incidents)



## Workplace Unsafe Act and Unsafe Condition



# the rusty lifting gear



Unsafe con-  
dition

◦ Unsafe act ◦ Near miss ◦ Accident

# Immediate and root causes

## Immediate cause

Unsafe act or condition that lead to the consequences (harm, damage etc).

eg Not using PPE, spillage, failure of a vessel, removed guard.

## Root cause

Underlying circumstances that allowed immediate cause to happen.

eg management or systems failures.

# Lessons learnt and benchmarking

## Lessons learnt

Findings of accident and incident investigations.

Striving for continual improvement.

## Benchmarking

Comparing an organisation against:

- another organisation;
- a national standard, eg HSE accident statistics publication; and/or
- an operational standard.

# Why Manage HSE?



Moral reasons



Legal reasons



Economic reasons

# ENVIRONMENTAL POLICY?



# Why Manage HSE?



Doha Engineering &  
Construction Company WLL  
شركة قطر للمهندسة  
والإنشاءات - دوحة

09-April-2013

## Environmental Policy

Qatar Engineering and Construction Company WLL (Qcon) management considers Environment Protection as one of the core element in its business. It is the Philosophy of the Company that to achieve business excellence Environment Protection with due consideration to its employees and other interested parties, ecology; terrestrial and other endangered species is given paramount importance.

Qcon is committed to:

1. Compliance with all applicable Statutory Regulations, National and International Environmental Laws and other requirements to which Qcon standards subscribes;
2. Implementation of an effective Environmental Management System to minimize adverse environmental aspects and impacts which will affect environment, endangered species, Qcon employees and other interested parties;
3. Provide framework for continual improvement on Environmental Protection by setting Targets, Objectives and Programmes on relevant levels and function in the organization;
4. Provide the necessary resources, education/trainings, skills and motivation to all employees so that this Policy is consistently implemented throughout;
5. Recording of non-conformance and any environmental emission at all levels and to use this information to help and ensure that proper and efficient work practices are established;
6. Ensuring that contractors and suppliers working for Qcon commit to Environmental Requirements of principals and demonstrate such commitment in their activities;
7. Reviewing this policy for its continuing suitability for application, ensuring that is understood by our employees, is available to interested parties and the public.

Mazen Abu Naba'a  
Managing Director

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# Waste

**Hazardous waste** is a **waste** with properties that make it potentially dangerous or harmful to human health or the environment.

## **examples of hazardous waste**

Paints, batteries, solvents, cleaning agents and pesticides.

## **Non-hazardous waste**

is a **waste** with properties that make it not potentially dangerous or harmful to human health or the environment.

Household waste, paper, wood, biodegradable materials

# Safe Handling and Storage

## Factors to consider – solid wastes:

- ▶ The hazardous nature of the waste
- ▶ Manual handling risks
- ▶ Safe access to skips, bins, etc.
- ▶ Don't store on unmade ground
- ▶ Moving parts of compactors
- ▶ Vehicle hazards, e.g. skip lorries
- ▶ Security of the waste
- ▶ Segregation
- ▶ Documentation



# Safe Handling and Storage

## Factors to consider – liquid wastes:

- ▶ Containers located in bund, away from walls
- ▶ Bunds have sufficient capacity of largest container
- ▶ Provision for rainwater
- ▶ Transfer points, e.g. pumps bunded
- ▶ Protect bund from damage
- ▶ Bunds checked and maintained



# Source Of Hazardous Waste

## A) Paint drums



1. Painting is done for Vessels, columns and exchangers in this TAR.
2. Empty paint drums and thinner containers are source of fire.

ASPECT: Use of hazardous chemicals for Equipment painting

IMPACT: Air pollution due to spray painting, fire, respiratory problems

# Source Of Hazardous Waste

## B) Contaminated insulation



1. Insulation is done over pipe lines, valves, vessels etc.
2. Insulation gets contaminated due to leakage of chemicals.

ASPECT: Insulation of piping and equipments, depletion of natural resources

IMPACT: Dust / particulates in Air, chronic poisoning

# Source Of Hazardous Waste

## C) Waste oil



- 1.Oil present in exchangers, columns and used oil are the major sources.
- 2.Waste oil is a source for fire.

ASPECT: Crude oil distillation, Oil used for lubrication, Depletion of resources

IMPACT: Ground water contamination,

# Source Of Hazardous Waste

## D) Rags (Contaminated PPE)



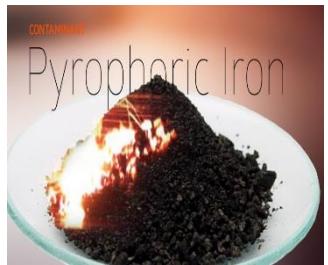
1. Hand gloves area provided for all employees
2. Gloves gets contaminated by hazardous material during work.

ASPECT: Use of gloves for hand protection, water and chemical used for cotton production

IMPACT: Non-Biodegradable , Effect on aquatic flora & Fauna, ground water

# Source Of Hazardous Waste

## E) Pyrophoric Solids



- 1.Iron sulphide occurs as a result of the corrosive action of sulphur on Iron
- 2.Pyrophoric material is liquids or solids that have the potential to spontaneously ignite in air at temperatures of 130° F (54° C) or below.
- 3.Pyrophoric material is present in columns, reactor vessels, exchangers.

ASPECT: Corrosion of equipments due to reaction of Hydrogen sulphide, resource depletion.

IMPACT: Toxic Fumes, Cause of Fire.

# Source Of Hazardous Waste

## F) Sand Blasting Waste



1. Material to be painted is cleaned with pressurized garnet sand for surface preparation.
2. Waste sand becomes hazardous if sand blasting is done over chemical contaminated material.

ASPECT: Surface cleaning of equipments, resource depletion

IMPACT: Human respiratory Problems, air pollution

# Source Of Hazardous Waste

## G) Contaminated Sulphur



1. Sulphur is produced in refinery process.
2. Loose sulphur and sulphur dust is flammable.
3. Accumulations of sulphur dust is explosive if not managed properly.
4. Sulphur burns with a blue flame that may be difficult to see in daylight.

ASPECT: Recovery of sulphur from Hydrogen sulphide, fumes, dust

IMPACT: Health effect, fire

# Source Of Hazardous Waste

## H) Activated Carbon



1. Activated carbon is used in refineries for recovery of gasoline vapours.
2. Used activated carbon becomes hazardous as it is contaminated with chemical.

ASPECT: Used for vapour removal, resource depletion

IMPACT: land pollution, water pollution

# Source Of Hazardous Waste

## I) Molecular Sieves



1. Molecular sieve is a material with pores of uniform size.
2. Molecular sieves are used as adsorbent for gases and liquids.

ASPECT : Used to support chemical reaction

IMPACT: Air Pollution, land contamination, depletion of resource

# Source Of Non-Hazardous Waste

## Food Waste & Tea Cups



1. Food packet, tea is provided during Turn around.
2. When it is not properly handled it becomes a nuisance to environment.

# Handling Of Waste

## B) Waste Oil



1. Waste oil has to be collected in drums.
2. Proper PPE has to be used for collecting waste oil.
3. Waste oil collected should be segregated from other flammable substances.

# Handling Of Waste

## C) Rags (Contaminated PPE)

1. Contaminated PPE should be collected separately in waste bins.
2. Contaminated PPE is a source of health hazard.

# Handling Of Waste

## D) Food Waste

1. Food waste are collected in waste skips.
2. Food waste collected should be covered with green net to prevent spread of flies and insects.

# Handling Of Waste

## E) Sulphur Waste

1. Contaminated sulphur is collected in plastic drums from sulphur recovery pit.
2. Proper PPE to be used during collection of sulphur waste.
3. Fire extinguishers to be placed near sulphur pit during removal of sulphur

# Handling Of Waste

## F) Contaminated Insulation

1. During removal of insulation if it is contaminated with chemical, it should be placed separately.
2. Contaminated insulation should not be mixed with other insulation materials.

# Handling Of Waste

## G) Sand Blasting Waste

- 1.If sand blasting is done over hazardous material handling equipment it should be stored separately.
- 2.House keeping to be done at the end of shift for collection of waste material.
- 3.Tarpaulins has to be placed at ground level to collect the waste garnet sand.

# ENVIRONMENTAL POLLUTION

- Environmental Pollution can be defined as any undesirable change in **physical, chemical, or biological** characteristics of any component of the environment i.e. air, water, soil which can cause harmful effects on various forms of life or property.
- **Pollution:** The term pollution can be defined as influence of any substance causing **nuisance, harmful effects, and uneasiness** to the organisms
- **Pollutant:-** Any substance causing **Nuisance or harmful effects or uneasiness** to the organisms, then that particular substance may be called as the pollutant.

# TYPES OF POLLUTION

- **WATER POLLUTION**
- **AIR POLLUTION**
- **LAND POLLUTION**
- **NOISE POLLUTION**

# WATER POLLUTION



- ❖ **Water Pollution** can be defined as alteration in **physical, chemical, or biological** characteristics of water through natural or human activities and making it unsuitable for its designated use.
- ❖ Fresh Water present on the earth surface is put to many uses. It is used for drinking, domestic and municipal uses, agricultural, irrigation, industries, navigation, recreation. The used water becomes contaminated and is called waste water.

# SOURCES OF WATER POLLUTION

- Most of Water Pollution is man made It may also occur naturally by addition of soil particles through erosion animal wastes and leaching of minerals from rocks
  
- The sources of water pollution can be classified as
  - + Municipal Waste Water
  - + Industrial Waste
  - + Inorganic Pollutants
  - + Organic Pollutants
  - + Agricultural Wastes
  - + Marine Pollution
  - + Thermal pollution

# MUNICIPAL WASTE WATER



# **INDUSTRIAL WASTE**

**The major source of water pollution is the waste water discharged from industries and commercial bodies, these industries are chemical, metallurgical, food processing industries, textile, paper industries. They discharge several organic and inorganic pollutants. That prove highly toxic to living beings.**

# INDUSTRIAL WASTE

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- ✖ They include fine particles of different metals, chlorides, sulphates, oxides of iron, cadmium, acids and alkalies.



ENTS

# ORGANIC POLLUTANTS

- ✖ They Include oils, fats, phenols, organic acids grease and several other organic compounds



# AGRICULTURAL WASTES

- ✖ Chemical fertilizers and pesticides have become essential for present day high yielding crops.
- ✖ Consequently , they have become a potential source of water pollution.

- ▶ These fertilizers contain major plants Nutrients mainly nitrogen, phosphorous, and potassium.
- ✖ Excess fertilizers may reach the ground water by leaching or may be mixed with surface water of rivers, lakes and ponds by runoff and drainage.



# **THERMAL POLLUTION**

- ✖ Thermal Pollution of water is caused by the rise in temperature of water. The main source of thermal pollution are the thermal and nuclear power plants. The power generating plants use water as coolants and release hot water into the original source. Sudden rise in temperature kills fish and other aquatic animals.



# AIR POLLUTION



- ❖ **Air pollution** is the introduction of chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment or built environment, into the atmosphere.
- ❖ A substance in the air that can cause harm to humans and the environment is known as an air pollutant.

# CAUSES OF AIR POLLUTION

- ✓ Carbon dioxide-this happens because of Deforestation and fossil fuel burning.
- ✓ Sulfur dioxide –Due to the burning of sulfur containing compounds of fossil fuels.
- ✓ Sulfur oxides- very dangerous to humans at a high concentration. Sulfur in the atmosphere is responsible for acid rain.

# CONSEQUENCES OF AIR POLLUTION

- CO<sub>2</sub> is a good transmitter of sunlight, but it also partially restricts infrared radiation going back from the earth into space, which produces the so-called greenhouse effect that prevents a drastic cooling of the Earth during the night.
- CO<sub>2</sub> in atmosphere --> GLOBAL WARMING

# LAND POLLUTION



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- **Land pollution** is the demolition of Earth's land surfaces often caused by human activities and their misuse of land resources. It occurs when waste is not disposed properly.
- Urbanization and industrialization are major causes of land pollution.



# CAUSES OF LAND POLLUTION

- Four Main causes of land pollution:
  - Construction
  - Agriculture
  - Domestic waste
  - Industrial Waste

# CONSTRUCTION

- ❑ Buildings take up resources and land, the trees are chopped down and used to make buildings.
- ❑ Takes away the places for animals and other organisms to live.



# AGRICULTURE

- ❑ As there are more and more people inhabiting the earth, food is in higher demand and so forests are chopped down and turned into farmland
- ❑ In addition, herbicides, pesticides, artificial fertilizers, animal manure are washed into the soil and pollute it.



# DOMESTIC WASTE

- ❑ Tons of domestic waste is dumped every day. Some waste from homes, offices and industries can be recycled or burnt in incinerators .
- ❑ There is still a lot of garbage, such as refrigerators and washing machines that are dumped in landfills simply because they cannot be reused in anyway, nor recycled .



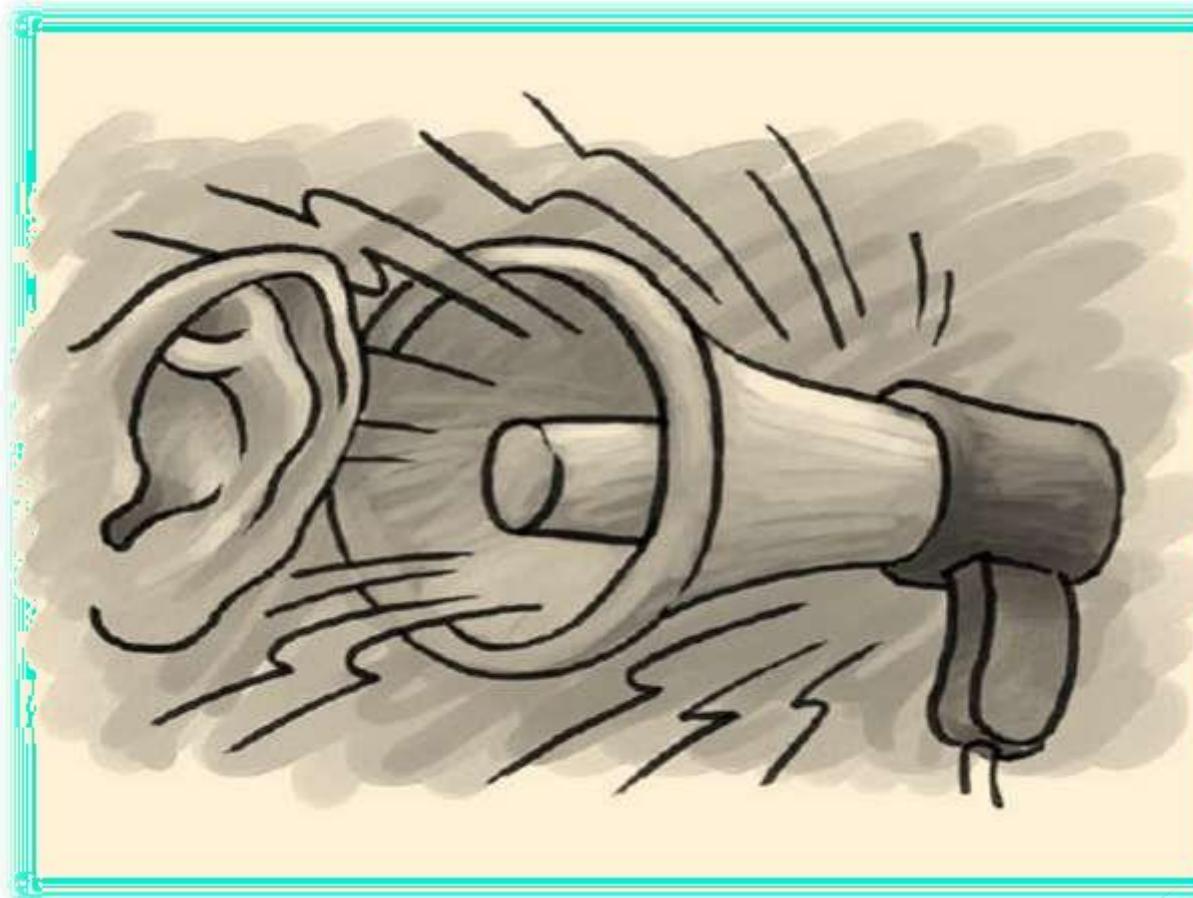
# INDUSTRIAL WASTE

- Plastics factories, chemical plants, oil refineries, nuclear waste disposal activity, large animal farms, coal-fired power plants, metals production factories and other heavy industry all contribute to land pollution.



# NOISE POLLUTION

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- **Noise pollution** is excessive, displeasing human, animal, or machine-created environmental noise that disrupts the activity or balance of human or animal life.
- Sound becomes undesirable when it disturbs the normal activities such as working, sleeping, and during conversations.
- World Health Organization stated that “Noise must be recognized as a major threat to human well-being”

# **SOURCES OF NOISE POLLUTION**

- Transportation systems are the main source of noise pollution in urban areas.**
- Construction of buildings, highways, and streets cause a lot of noise, due to the usage of air compressors, bulldozers, loaders, dump trucks, and pavement breakers.**
- Industrial noise also adds to the already unfavorable state of noise pollution.**
- Loud speakers, plumbing, boilers, generators, air conditioners, fans, and vacuum cleaners add to the existing noise pollution.**

# EFFECTS OF NOISE POLLUTION

- According to the USEPA, there are direct links between noise and health. Also, noise pollution adversely affects the lives of millions of people.
- Noise pollution can damage physiological and psychological health.
- High blood pressure, stress related illness, sleep disruption, hearing loss, and productivity loss are the problems related to noise pollution.
- It can also cause memory loss, severe depression, and panic attacks.

# SOLUTIONS FOR NOISE POLLUTION

- **Planting bushes and trees in and around sound generating sources is an effective solution for noise pollution.**
- **Regular servicing and tuning of automobiles can effectively reduce the noise pollution**
- **Social awareness programs should be taken up to educate the public about the causes and effects of noise pollution.**
- **Workers should be provided with equipments such as ear plugs and earmuffs for hearing protection.**

- Similar to automobiles, lubrication of the machinery and servicing should be done to minimize noise generation.
- Soundproof doors and windows can be installed to block unwanted noise from outside.
- Regulations should be imposed to restrict the usage of play loudspeakers in crowded areas and public places.
- Factories and industries should be located far from the residential areas.

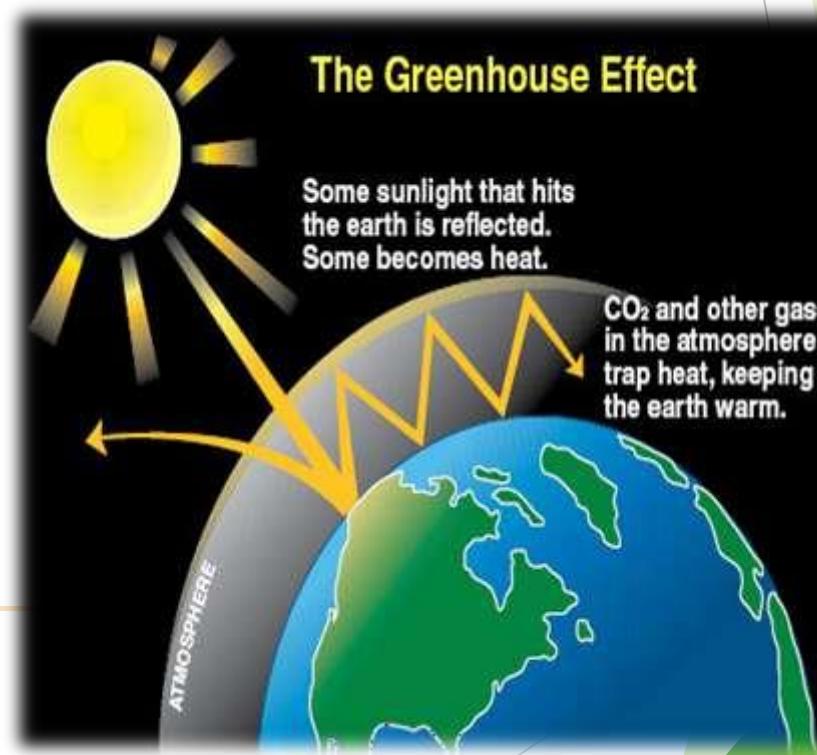
# WAYS TO STOP POLLUTION

- ❑ We believe that it is the responsible thing to do to increase recycling.
- ❑ It is just like doing laundry and separating blacks and colors.
- ❑ The residents of the country should also try and do their part and put in at least one day of litter picking up.

# GREENHOUSE EFFECT



**Global Warming**



**Greenhouse Effect**

# DIFFERENCE BETWEEN GLOBAL WARMING AND THE GREENHOUSE EFFECT

- ❖ **Global warming** refers to a rise in the temperature of the surface of the earth.
- ❖ The **Greenhouse Effect** is a process by which thermal radiation from a planetary surface is absorbed by atmospheric greenhouse gases, and is re-radiated in all directions.

# MSDS

1. Chemical Identity: Name of the product including the common name if one exists
2. Manufacturer's Information: Name, address, phone number, and emergency phone number of the manufacturer
3. Hazardous Ingredients/Identity Information: List of hazardous chemicals.
4. Physical/Chemical Characteristics: Boiling point, vapor pressure and density, melting point, evaporation rate, etc.
5. Fire and Explosion Hazard Data: Flash point, flammability limits, ways to extinguish special firefighting procedures, and unusual fire and explosion hazards.
6. Reactivity Data: How certain materials react with others when mixed or stored together.
7. Health Hazard Data: Health effects (acute=immediate; chronic=longterm), ways the hazard can enter the body (lungs, skin, or mouth), signs and symptoms of exposure, emergency and first-aid procedures
8. Precautions of Safe Handling and Use: What to do in case materials spill or leak, how to dispose of waste safely, how to handle and store materials in a safe manner
9. Control Measures: Ventilation (local, general, etc.), type of respirator/ filter to use, other appropriate engineering controls, work practices or personal protective equipment (PPE) such as gloves, safety glasses, or goggles, face shields, aprons, etc.
10. Primary Routes of Entry: inhalation, absorption, etc.
11. Emergency and First-Aid Procedures: flushing with water, removal to fresh air, etc.

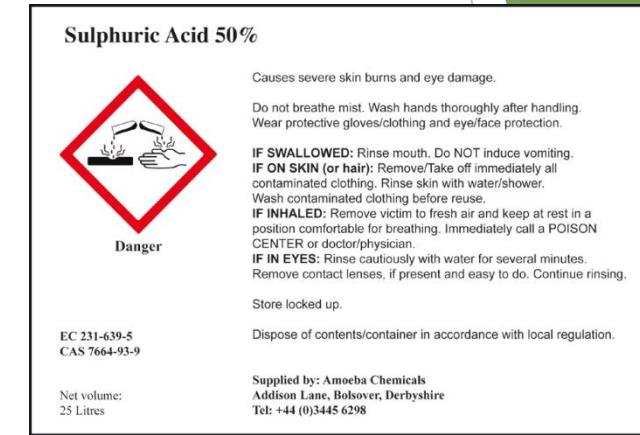
# Labelling



# Sources of Information

## Product Labels

- ▶ Name of substance
- ▶ Hazardous components
- ▶ Risk phrases indicating danger
- ▶ Precautions
- ▶ Details of supplier



# Group Syndicate Exercise

Manufacturers' Safety Data Sheets:

Outline the type of information you would expect to see on a safety data sheet for a domestic weedkiller in order to assess the risks.



# Safety Data Sheet Contents

- 1. Details of substance and supplier
- 2. Composition of substance
- 3. Hazard identification
- 4. First-aid measures
- 5. Fire-fighting measures
- 6. Accidental release measures
- 7. Handling and storage
- 8. Exposure controls/PPE
- 9. Physical/Chemical properties
- 10. Stability and reactivity
- 11. Toxicological information
- 12. Ecological information
- 13. Disposal requirements
- 14. Transport information
- 15. Regulatory information
- 16. Other information

# Storage of Waste

B) Metal Scrap: To be stored in Skips placed near plant



# Storage of Waste

C) Contaminated Sulphur : To be stored in Plastic drum



# Storage of Waste

D) Food Waste : To be dumped in Skips placed near mess hall



# Hygiene

## A) Noise



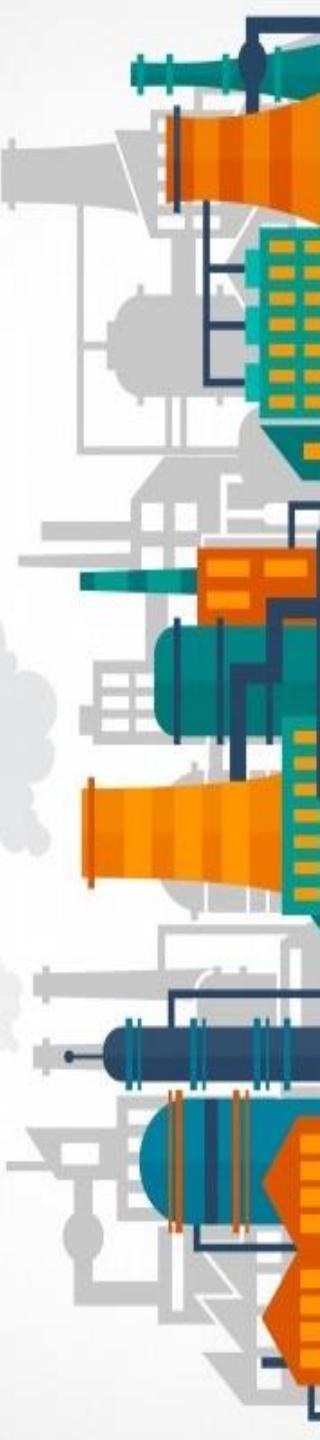
1. High noise arise from venturi which is placed for ventilation.
2. Ear plug has to be used near high noise area.

# Storage of Waste

## B) Radiation



1. Radioactive sources are used for level measurement and for various other purposes.
2. Employees has to keep away from radioactive sources.



# Hierarchy of Risk Control

## Elimination

Best method of dealing with a hazard is to eliminate it Example: *Outsourcing the painting activity, Avoid height work, work from ground*

## Substitution

-Substituting or replacing a hazard or hazardous work practice with a less hazardous one

Example :                          High solvent paint to low solvent paint

Mercury cell to Membrane cell

## Engineering controls

Design changes, modification of work equipment and workplace

- Machine guard, Ventilation
- separation, segregation, partial enclosure, safety devices

## Administrative controls

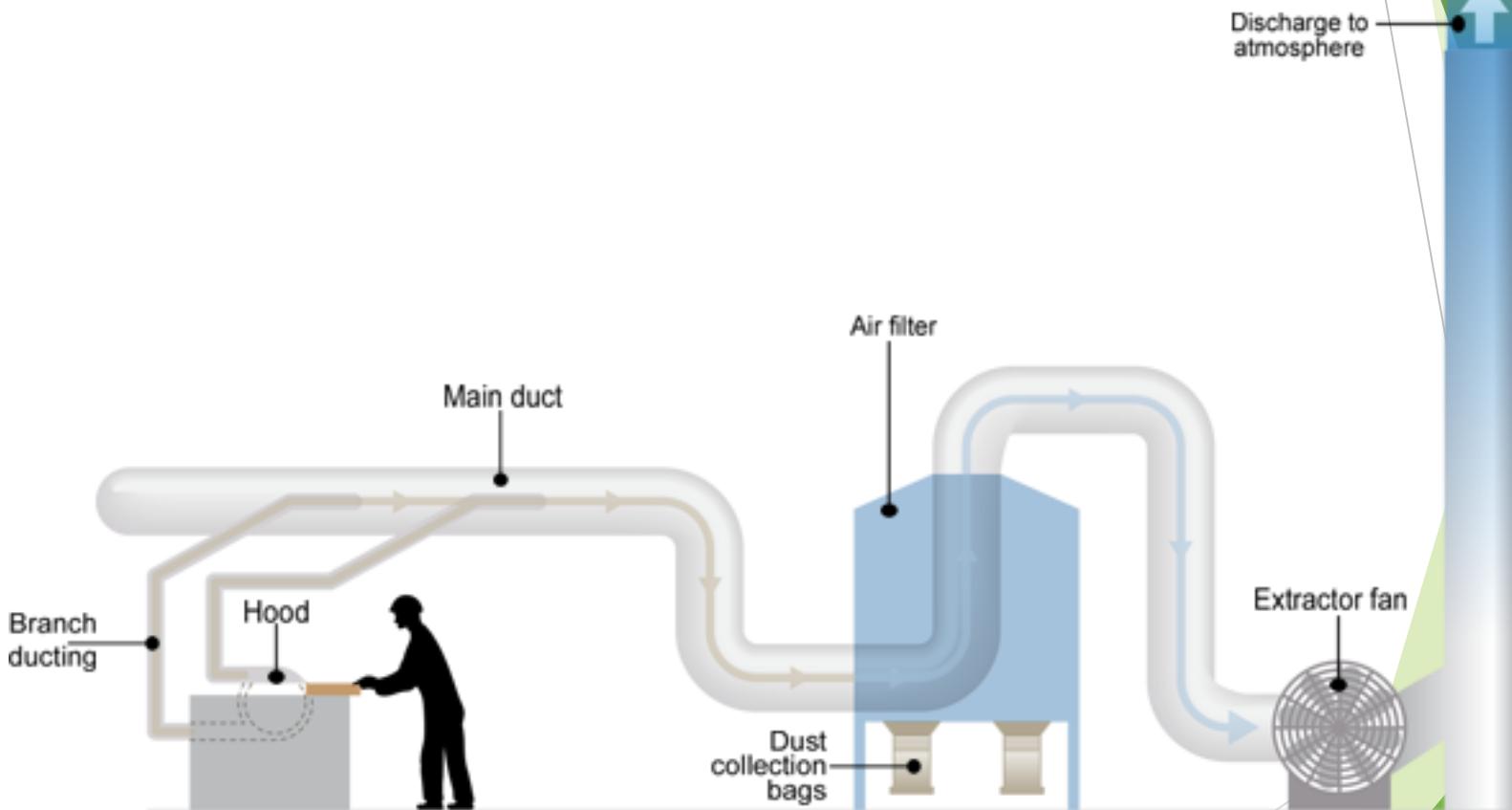
Management action to control the risk

- safe systems of work
- Job rotation, frequent break, health monitoring
- information, instruction, training and supervision

## Personal Protective Equipment –

Provision of PPE Example – Helmet, Gloves, Mask etc

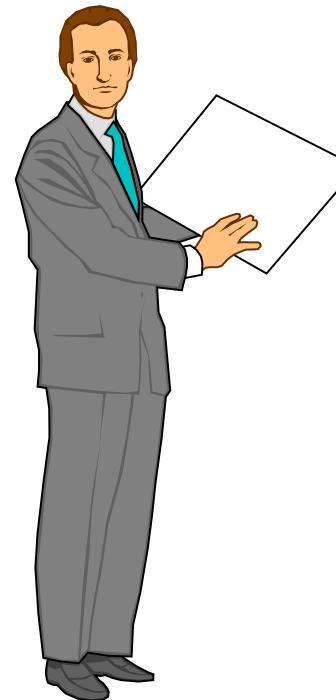
# Local Exhaust Ventilation



# Types of Audit

## ► First Party Audit

- Undertaken by an organization on its own quality system - to seek conformance and improvement.
- Known as the Internal Audit



# Types of Audit

## ► Second Party Audit

- Undertaken by an organization on an existing or potential supplier usually relating to a contract of supply.
- Also known as the Vendor Audit, or Supplier Assessment.



# Types of Audit

## ► Third Party Audit

- Undertaken by an independent body on an organization seeking conformance to a standard such as ISO 9001.
- Also known as a third party assessment or conformance audit.



## **Stage 1 Audit**

To evaluate the OH&S system is in compliance with a standard

- ❖ Document review



## **Stage 2 Audit**

To evaluate the implementation, including effectiveness, of the client's management system.

## Surveillance Audit

- ❖ Surveillance audits are on-site audits
- ❖ Certified management system continues to fulfill requirements

## Re-Certification Audit

The Re-Certification audit includes an onsite audit

- ❖ Verify the Full Management system
- ❖ Demonstrate commitment
- ❖ Enhance overall performance
- ❖ Achievement of the organization's policy and objectives



# Checklists

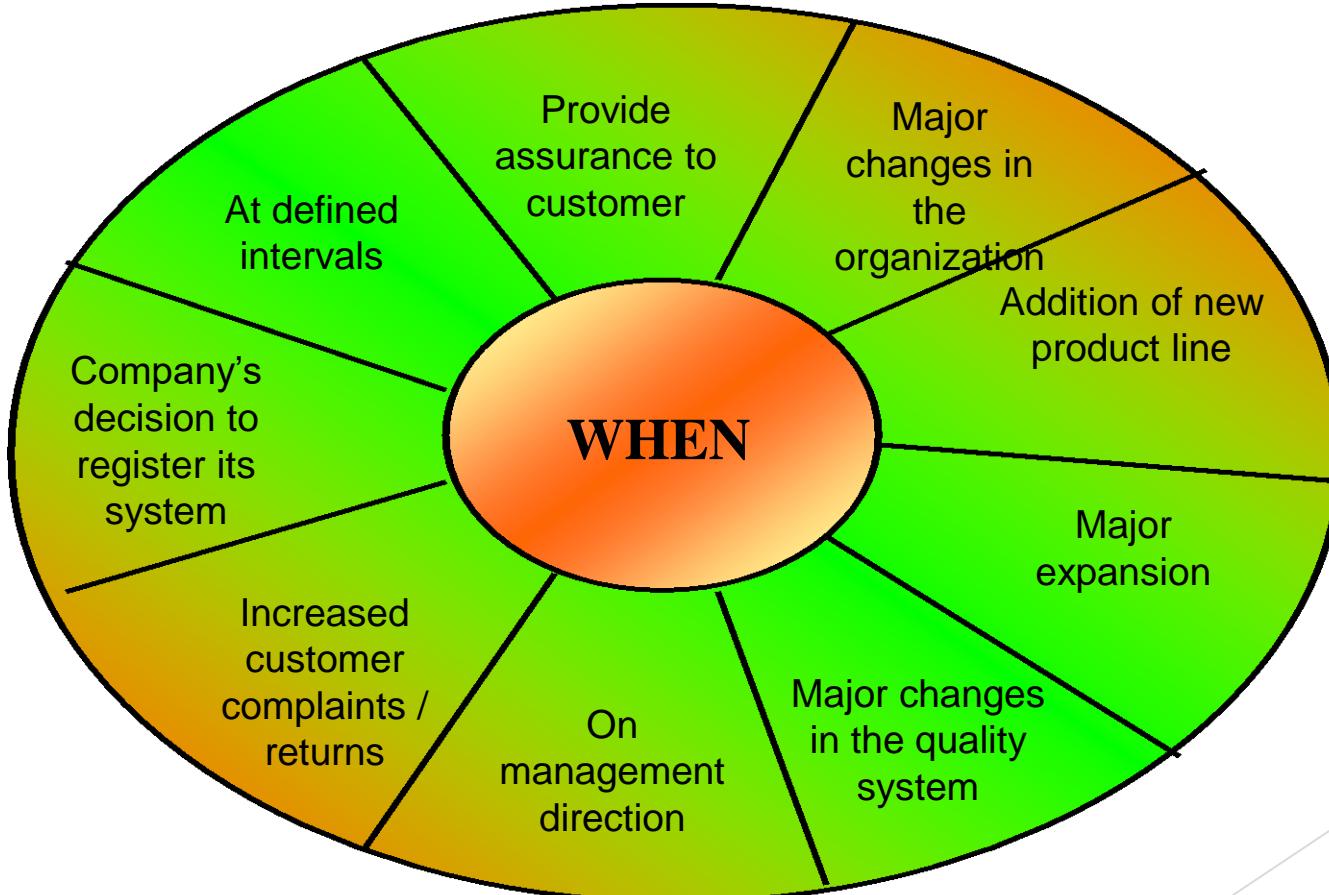
- a. Introduction
- b. Purpose
- c. Preparation of Checklists
- d. Advantages of Checklists
- e. Disadvantages of Checklist
- f. Essential features of a Process Based Checklist
- g. Conclusion



## ADDING VALUE

- ▶ **Quality Audits provide:**
  - ▶ A mechanism to evaluate progress
  - ▶ A focus for improvement
  - ▶ An independent view
  - ▶ A formal approach to continual improvement

# Internal Audit



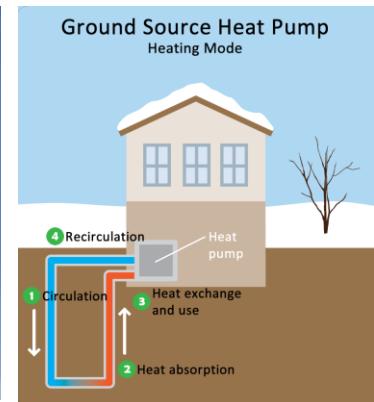
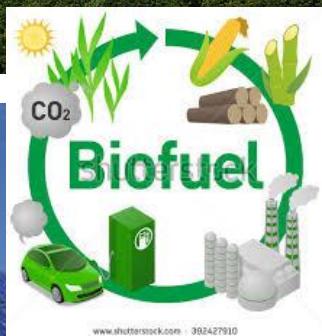
# Internal Audit



## Audit Programme Procedures

- Must address the following
  - Planning and scheduling audits
  - Assuring competence of auditors and audit team leader
  - Selecting appropriate audit team
  - Assigning roles and responsibilities
  - Conducting audits
  - Conducting audit follow up, if applicable
  - Maintain audit programme records
  - Monitoring performance and effectiveness

# Renewable Energy



# Renewable Energy

- ▶ Maine is endowed with plentiful bioenergy, wind, hydropower, ocean, and other renewable energy resources.
- ▶ Non-hydro renewables are responsible for 32% of in-state generation, a higher percentage than in any other state in the nation.

# Renewable Energy

- ▶ Maine is home to the country's first tidal energy device to generate electricity for the power grid and first working offshore wind turbine (as of 2014).



# Solar Energy

We use solar thermal energy systems to

- ▶ heat water for use in homes, buildings, or swimming pools
- ▶ heat the inside of homes, greenhouses, and other buildings
- ▶ heat fluids to high temperatures in solar thermal power plants

Solar photovoltaic devices, or solar cells, change sunlight directly into electricity.

# Solar Energy



# Solar Energy

The two main benefits of using solar energy are

- ▶ Systems do not produce air pollutants or carbon dioxide.
- ▶ Systems on buildings have minimal impact on the environment.

The main limitations of solar energy are

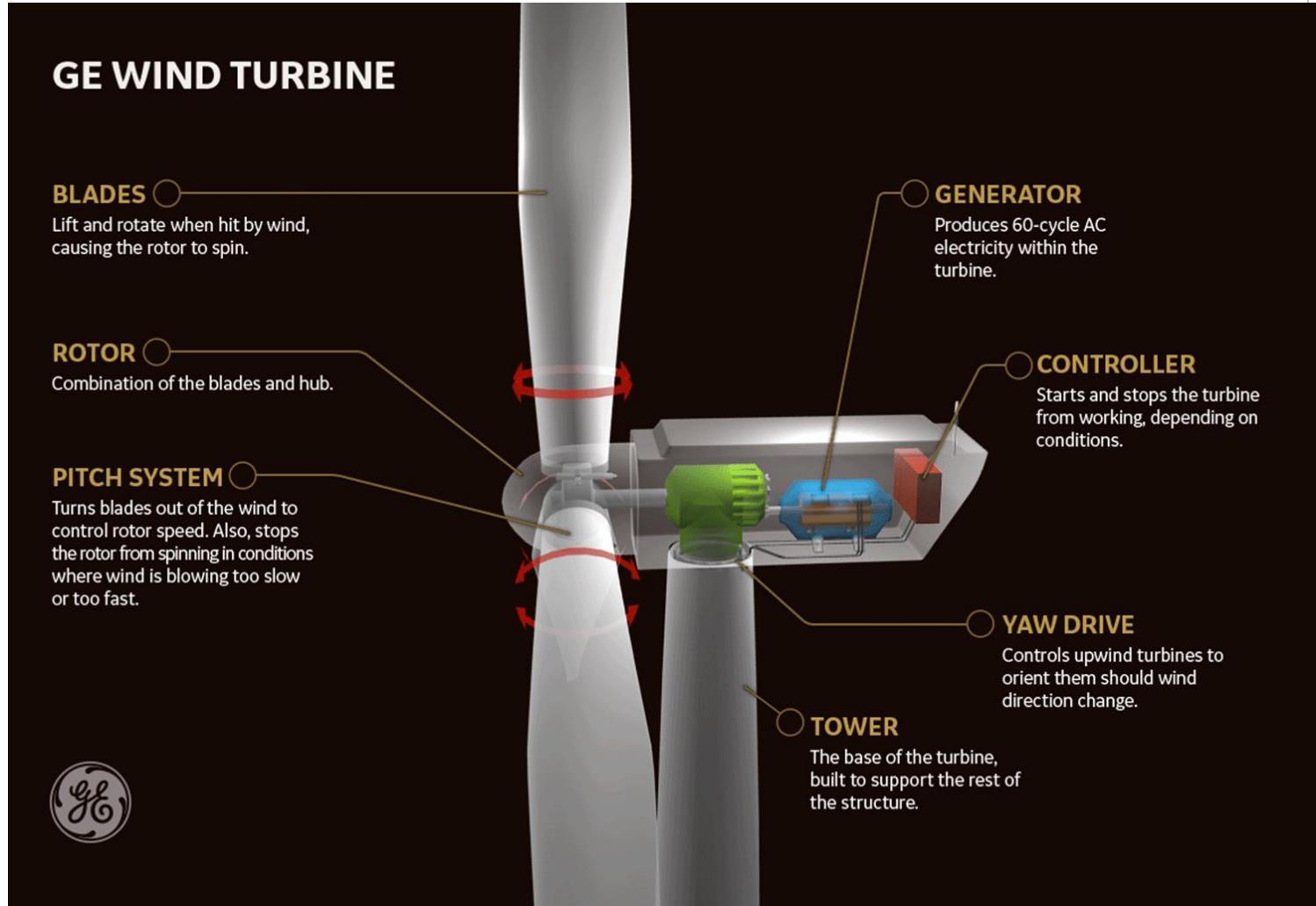
- ▶ The amount of sunlight that arrives at the earth's surface is not constant. The amount of sunlight varies depending on location, time of day, season of the year, and weather conditions.
- ▶ The amount of sunlight reaching a square foot of the earth's surface is relatively small, so a large surface area is necessary to absorb or collect a useful amount of energy.

# Wind Energy

- ▶ Wind turbines operate on a simple principle. The energy in the wind turns two or three propeller-like blades around a rotor. The rotor is connected to the main shaft, which spins a generator to create electricity



# Wind Energy



# Wind Energy

- ▶ Wind turbines are mounted on a tower to capture the most energy. At 100 feet or more above ground, they can take advantage of faster and less turbulent wind.
- ▶ Wind turbines can be used to produce electricity for a single home or building, or they can be connected to an electricity grid for more widespread electricity distribution.

# Wind Energy

- ▶ Advantages of Wind Energy
  - ▶ Clean and renewable source of power
  - ▶ Cost effective
  - ▶ Rapid growth of industry, large potential
- ▶ Disadvantages of Wind Energy
  - ▶ Wind reliability
  - ▶ Threat to wildlife
  - ▶ Noise and visual pollution



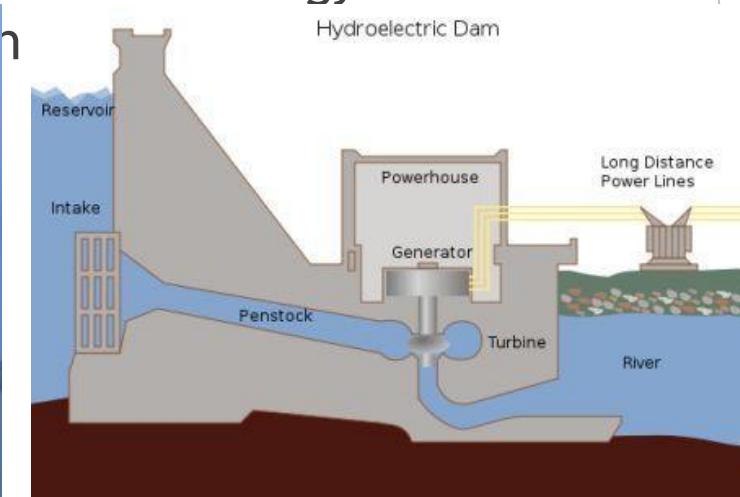
# Tidal Energy

- ▶ Tidal Stream Generator

- ▶ Makes use of the kinetic energy of moving water to power turbines, in a similar way to wind turbines that use wind to power turbines.

- ▶ Tidal Barrage

- ▶ Tidal barrages make use of the potential energy in the



# Tidal Energy

- ▶ Advantages
  - ▶ Clean fuel source compared to fossil fuels
  - ▶ Domestic source of energy
- ▶ Disadvantages
  - ▶ Tidal power can have effects on marine life.
    - ▶ The turbines can accidentally kill swimming sea life with the rotating blades.
    - ▶ Some fish may no longer utilize the area if threatened with a constant rotating or noise-making object.
    - ▶ Installing a barrage may change the shoreline within the bay or estuary, affecting a large ecosystem that depends on tidal flats.

# Wave Energy

- ▶ Ocean waves contain tremendous energy potential.
- ▶ Wave power devices extract energy from the surface motion of ocean waves or from pressure fluctuations below the surface.



# Wave Energy

## ► Advantages

- ▶ Renewable
- ▶ Environmentally friendly compared to fossil fuel energy
- ▶ Variety of designs to use
- ▶ Less energy dependence from foreign governments

## ► Disadvantages

- ▶ Can affect the marine environment
- ▶ May disturb private or commercial shipping
- ▶ Dependent on wavelength for best operation
- ▶ Poor performance in rough weather
- ▶ Visual/noise issues



# Biofuels

- ▶ The two most common types of biofuels are **ethanol** and **biodiesel**.



# Biofuels

- ▶ Ethanol is an alcohol.
- ▶ Ethanol is mostly used as a fuel additive to cut down a vehicle's carbon monoxide and other smog-causing emissions.

# Biofuels

- ▶ Biodiesel is made by combining alcohol (usually methanol) with vegetable oil, animal fat, or recycled cooking greases.
- ▶ It can be used as an additive to reduce vehicle emissions (typically 20%) or in its pure form as a renewable alternative fuel for diesel engines.

# Biofuels

## ► Advantages

- ▶ Easy to source
- ▶ Renewable
- ▶ Reduces greenhouse gases
- ▶ Reduced dependence on foreign energy

## ► Disadvantages

- ▶ Higher cost of production (lower supply than gasoline)
- ▶ Shortage of food
- ▶ Water Use



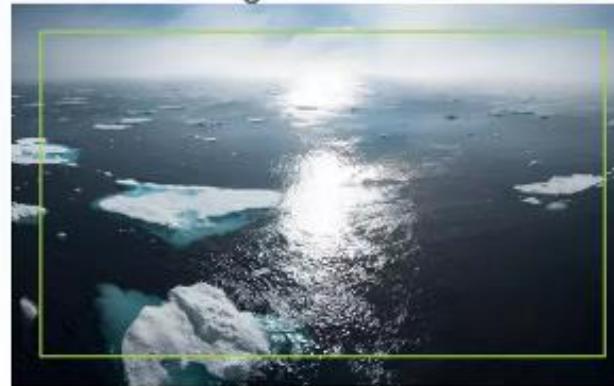


# ESG FACTORS: ENVIRONMENTAL ISSUES



Greenhouse  
Emission

Climate Change



Waste



Resources



Wildlife



Pollution



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## ESG FACTORS: SOCIAL



In 2016, the Walk Free Foundation estimated there were about 40.3 million slaves globally.

Social criteria investigates the company's relationships with other businesses and communities.

This includes the attitudes towards diversity, human rights, fighting slavery, consumer protection as well as charity through CSR and volunteer programs.



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# ESG FACTORS: SOCIAL ISSUES



Diversity

Child Labor



Slavery



Health & Safety



Migration



Indigenous  
Community



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## ESG FACTORS: GOVERNANCE

In governance, investors seek companies that uses accurate and transparent accounting methods; and allows voting on important issues.

Good governance avoid conflicts of interest such as bribery & corruption, crime and other illegal practices.



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# ESG FACTORS: GOVERNANCE ISSUES



Tax Strategy

Bribery & Corruption



Executive Pay



Shareholder Rights



Illegal Activities



Board Diversity



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# MAIN BENEFITS OF ESG

Research shows that sustainability has real business benefits when they are consistently integrated into business operations.

## Brand Image & Competitive Advantage

Attract good employees, loyal customers & responsible investors



## Increased Productivity & Reduced Costs

Efficient operation conserve resources in the long run

## Increased Compliance

Ability to adapt with changing regulations in timely manner



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# CONCLUSION

- ESG or 'responsible growth', should be regarded as an investment, not a cost.
- ESG demands transparency and applying various standards and policies to a company's operation, which greatly increases compliance.
- ESG weeds out unsustainable companies with outdated practices and harmful side effects.
- It helps to minimize risks for investors as they are constantly seeking for more responsible companies with a greater likelihood of success.

# Environment

# Climate Change

- ▶ Green house gas emission from company
- ▶ Stakeholders must more aware of climate change
- ▶ It effects the profitability along with reputation
- ▶ Company must measure/monitor climate change

# Climate Change - monitoring parameters

- ▶ Carbon emissions
- ▶ Waste management
- ▶ Energy consumption
- ▶ Water consumption

# Climate Change - Control benefits

- ▶ Reduced green house gas emission
- ▶ Establishment of renewable energy facilitates
- ▶ Sustainable waste management cuts pollution
- ▶ To make workplace safer and healthier

# Pollution and Waste



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# What is waste? What is pollution?

- ▶ Pollution is defined as the harmful effects of an activity, which is the main difference between pollution and waste.
- ▶ All processes create waste, but not all will create pollution. Since not all waste is harmful, not all waste is pollution.
- ▶ When waste is indeed harmful, it would then be classified as pollution.

# **Resource and Land Use**

# Aim - Resource and Land Use

- ▶ To support economic growth
- ▶ To social wellbeing
- ▶ To support environment

# Land use concerns

- ▶ Erosion by wind and water
- ▶ Maintaining and enhancing soil quality
- ▶ Water quality and quantity
- ▶ Plant condition and health
- ▶ Wildlife habitat

# Land Management

- ▶ It is the process of managing the use and development of land resources in a sustainable way
- ▶ Land is basic element of life support system

# Land management problems

- ▶ Common property land resources
- ▶ Land use change
- ▶ Combating land degradation and desertification
- ▶ Stakeholder participation and awareness creation
- ▶ Legislation, policies, programmes and other initiatives

# Strategies for sustainable land management

- ▶ Practices requiring change
  - ▶ Greater aboriginal involvement and respect
  - ▶ Improved communication
  - ▶ Management of commercial activities
- ▶ Support required
  - ▶ Recording ecological knowledge
  - ▶ Developing and implementing management plans for vulnerable resources

# **Ecological Footprint**



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# Ecological Footprint

- ▶ It determines, how dependent humans are on natural resources
- ▶ It measures, how much resources from the environment are required
- ▶ Amount of pressure that humans put on the natural resources
- ▶ It determines the land area required by each human to sufficiently meet their needs
- ▶ Think of it as the demand required by humans, and the supply offered by nature
- ▶ Used to calculate sustainability of an entity such as a region, an individual or business

# Biodiversity

# Biodiversity

- ▶ It is closely linked to climate change and other environmental issues
- ▶ It protect natural capital, support long-term sustainable development
- ▶ It mitigate financial risk
- ▶ Loss of biodiversity poses real and substantial threats

# Social



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# ESG FACTORS: SOCIAL ISSUES



Diversity



Child Labor



Slavery



Health & Safety



Migration



Indigenous  
Community



# **Health & Safety**

# Health and Safety

- ▶ Tracking incidents and hazards and performing mitigation efforts.
- ▶ Ensuring that all employees have training specific to the risks associated with their work.
- ▶ Confirming that EHS policies are ethical.
- ▶ Ensuring that training, procedures, tasks, etc. are performed in a manner or via a system or practice that is inclusive and promotes diversity and equity.
- ▶ Managing your chemical database effectively and including government required environmental reporting
- ▶ Ensuring employees have no-barrier access to SDSs (safety data sheets).
- ▶ Focusing on employee health and well-being.

- ▶ Employee well-being
- ▶ Operational risk management
- ▶ Reputation protection
- ▶ Compliance with regulations and standards
- ▶ Social responsibility

# **Role of H&S in environment sustainability**

- ▶ Waste management
- ▶ Energy efficiency
- ▶ Hazardous material reduction
- ▶ Conservation of natural resources
- ▶ Compliance with environmental regulations

# **Benefits of prioritizing H&S in ESG**

- ▶ Reduces environmental impact
- ▶ Prevent pollution
- ▶ Reduction of carbon foot print
- ▶ Reducing hazardous material
- ▶ Preservation of natural resources
- ▶ Protect the environment for future generations

# **Product & Consumer Responsibility**

# **Product & Consumer Responsibility**

- ▶ Taking personal responsibility for the environmental costs and consequences of what you purchase and use.
- ▶ Choose items that are made with recycled content.
- ▶ Purchase services and activities for gifts instead of material goods.
- ▶ Buy your produce at farmers markets whenever possible.
- ▶ Buy local products to reduce transportation costs.

# **Product & Consumer Responsibility**

- ▶ Be aware about various goods and services available in the market.
- ▶ Buy only standardized goods as they provide quality assurance.
- ▶ Learn about the risks associated with products and services.
- ▶ Be honest in your dealings and choose only legal goods and services.
- ▶ Ask for a bill on purchase of goods or services.
- ▶ File complaint in case of poor quality of good or service.
- ▶ Avoid waste, littering and contributing to pollution.

# Consumer Rights

- ▶ The consumer has a right to be protected against goods and services which are hazardous to life and health. This is the right to safety.
- ▶ The consumer has a right to have complete information about the product he wants to buy. This is the right to be informed.
- ▶ The consumer has the right to choose the product he wants to buy. This means the firms in the market should make sure they provide the customer with a variety of products.
- ▶ The consumer has the right to be heard for which he could file a complaint.
- ▶ The consumer has the right to seek redress. This could be because of the consumer being dissatisfied with the product.
- ▶ The consumer has the right to be educated regarding all these rules.

# **Community Impact**

# **Positive Community Impact**

- ▶ Providing access to clean drinking water in a community that does not have it
- ▶ Building a school in a society that does not have one
- ▶ Providing job training to unemployed people
- ▶ Planting trees in a community to improve air quality and reduce pollution
- ▶ Supporting local businesses and farmers by purchasing their goods and services
- ▶ Providing access to education for underprivileged children
- ▶ Developing and implementing sustainable energy solutions

# **Positive Community Impact**

- ▶ Creating programs and initiatives to address homelessness and poverty
- ▶ Promoting equal rights and opportunities for marginalized groups
- ▶ Advocating for policies that protect the environment and combat climate change
- ▶ Supporting mental health services and reducing stigma around mental illness
- ▶ Providing access to healthcare for underserved populations
- ▶ Developing technologies and innovations that improve people's lives and well-being.

# **Negative Community Impact**

- ▶ Building a factory that pollutes the air and water in a community
- ▶ Cutting down trees in a society without replanting them
- ▶ Failing to provide safe working conditions for employees
- ▶ Discriminating against certain groups of people, such as based on race or gender
- ▶ Not paying employees a fair wage or providing them with adequate benefits.

# **Diversity & Inclusion**

# Diversity

- ▶ Diversity is the state of being varied or different from one another in some aspects. This includes things like race, sex, genetic background, gender identity and expression, and personal beliefs or values.
- ▶ Diversity in ESG includes everyone no matter their differences

# Inclusion

- ▶ Inclusion refers to making everyone feel welcomed and valued in a group environment.
- ▶ It about creating an atmosphere where everyone can contribute their best work without fear of reprisal.
- ▶ It is not enough to make sure everyone has the same opportunities, you also need to give them the ability to take part in those opportunities.

# **Difference between diversity and Inclusion**

- ▶ Diversity and inclusion both work towards the same goal, but there are some key difference between the two.
- ▶ Diversity is a measurable term while inclusion is a mindset
- ▶ Diversity includes all kinds of people while inclusion only focusses on those who feel excluded from certain opportunities in their workplace or community.

# **Benefits of Diversity and Inclusion**

- ▶ Encourages more innovation and creativity
- ▶ Creates a sense of ownership in the company that everyone is working towards reaching one goal
- ▶ Provides greater opportunities for everyone involved
- ▶ Reduces stress and increases overall happiness among employees
- ▶ It also helps attract and retain the best employees
- ▶ Decreases discrimination and harassment in the workplace and makes it a more pleasant environment for everyone to work in.

# **Labor Standards & Human Rights**

# Labor Standards

- ▶ Companies should respect and protect the labor rights of their employees, including fair wages, safe working conditions, reasonable working hours, and freedom of association.
- ▶ Conventions and Recommendations of the ILO form the international labor standards.
- ▶ **Conventions** are legally binding international treaties that may be ratified by member states.
- ▶ **Recommendations** are non-binding guidelines.

# **Human Rights**

- ▶ Workplace-related human rights issues can include fair treatment of employees, safe working conditions, fair wages, working hours, freedom of association, and protection against discrimination and harassment

# **Examples of Human Rights**

- ▶ Supply chains can pose risks to human rights, with issues such as forced labor, child labor, unsafe working conditions, and exploitation of vulnerable workers.
- ▶ These violations can occur in various industries and geographies and can have severe social and reputational impacts on companies that fail to address them effectively.

# **Role of companies in upholding human rights**

- ▶ Companies have a responsibility to respect and protect human rights throughout their operations and supply chains.
- ▶ This includes conducting due diligence to identify and address human rights risks, implementing policies and practices that promote human rights, engaging with stakeholders, and providing remediation for any human rights violations that may occur.

# ILO principles

- ▶ freedom of association and the effective recognition of the right to collective bargaining
- ▶ the elimination of all forms of forced or compulsory labour
- ▶ the effective abolition of child labour
- ▶ the elimination of discrimination in respect of employment and occupation; and
- ▶ a safe and healthy work environment (added in 2022).

# ESG



## ENVIRONMENTAL

Climate change strategy,  
Biodiversity,  
Water efficiency,  
Energy efficiency,  
Carbon intensity,  
Environmental  
management system



## SOCIAL

Equal opportunities,  
Freedom of association,  
Health and safety,  
Human rights,  
Customer &  
products responsibility,  
Child labour



## GOVERNANCE

Business ethics,  
Compliance,  
Board independence,  
Executive compensation,  
Shareholder democracy

# Governance

## ESG FACTORS: GOVERNANCE

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# ESG FACTORS: GOVERNANCE ISSUES



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# **Leadership & Corporate Governance**

# **Leadership & Governance**

- ▶ In terms of practice, corporate governance provides a formal structure for the relationships among organizational core constituencies, whereas leadership provides the energy and determination to make corporate governance effective in the achievement of the organization's purpose and goals.
- ▶ ESG is incorporated into corporate governance through shareholders.

# **Corporate Governance**

- ▶ They system of rules, practices, and process by which a firm is directed and controlled

# **Anti-Corruption & Bribery**

# **Anti-Corruption & Bribery**

- Business should work against corruption in all its forms, including extortion and bribery

# **UN Global Compact suggestion**

- ▶ Integrity pacts
- ▶ Anti-corruption declarations
- ▶ Certifying business coalitions
- ▶ Principle-based initiatives
- ▶ Education and training
- ▶ Companies sign “anti-corruption call to action”

# GRI Standard

- ▶ risk assessment procedures for corruption
- ▶ how conflicts of interest are managed
- ▶ how the organization ensures that donations and sponsorships are not a disguised form of bribery
- ▶ how is training and communication on anticorruption designed to address the actors at high risk of corruption
- ▶ when and how often the training takes place
- ▶ collective actions to fight corruption

# **Risk Management**

# Risk management

- ▶ Investors and consumers are increasingly focusing on environmental hazards as awareness of climate change, greenhouse gas emissions, resource consumption, and biodiversity protection has grown.

# **Risk Associated with Governance**

- ▶ Corporate morals and ethics
  - ▶ Conduct and practices that are anti-competitive
  - ▶ ESG regulation compliance (including emerging regulations)
  - ▶ ESG transparency
  - ▶ Open communications
  - ▶ Grievance policies and processes
- 
- Preventing fraud and corruption
  - Compensation for executives
  - Diversity of the Board of Directors
  - Corruption and extortion
  - Standards and regulations
  - Paying taxes

# **Risk Management helps to.....**

- ▶ Businesses may successfully recognize and evaluate ESG risks.
- ▶ Upper management oversees risk reduction and integrating ESG.
- ▶ Businesses have the necessary expertise, knowledge, and abilities to handle risks.
- ▶ Regulations are followed, and preparations are made.
- ▶ When establishing, putting into practice, and maintaining reporting standards, ESG risks are considered.

# **Tax Transparency**

# Tax Transparency

- ▶ Tax transparency is an approach to report information that offers stakeholders comprehensive and timely access to a company's total tax contribution
- ▶ It discloses the information that is qualitative, quantitative, or both
- ▶ It is one of the key issue in the governance pillar
- ▶ It focus on working towards reduction of effective tax rate
- ▶ It is one of the more critical measures
- ▶ **Accountability and Trust:** Transparent ESG reporting establishes accountability, fostering trust and credibility among stakeholders

# **Business Ethics**

# **Business Ethics**

- ▶ business ethics refers to the principles and values that guide a company's behavior in its operations and dealings with stakeholders.
- ▶ Ethics dictates that companies be profitable so that they can generate value for their investors, create jobs, and contribute to community prosperity.
- ▶ It explains the fundamental principles of the company
- ▶ It helps companies build trust and long-term value
- ▶ It helps to remain in competitive edge
- ▶ It helps to operations and overcome challenges.

# **Save Environment**

