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# Introduction

Aids to Navigation (ATON) play a critical role in protecting the environment by preventing maritime disasters that could have potentially catastrophic ecological impact on sensitive marine and terrestrial ecosystems.

However, AtoN equipment and activities themselves can create significant environmental impact through waste generation, unsustainable energy use, pollution and habitat disturbance. It is essential to minimize these negative impacts so that the benefits of AtoNs are not outweighed by unintended negative impacts of their operation on the environment. Minimizing the impacts can be achieved by responsible environmental management and the factoring in of environmental concerns to all levels of AtoN operations; design, installation, management and maintenance.

In order to manage the impact of AtoN activities on the environment, an ethos of environmental protection and natural resources stewardship should be promulgated throughout the organization. Environmental considerations should be made a part of all engineering, planning, and decision-making processes. Organizations should take into account the fact that environmental management is a global concern and that while most impacts are localized, their operations can and do play a part in more complex impacts on a much broader environment.

The increased focus on environmental performance requires AtoN entities to focus on sustainable practices and the identification of ways to reduce its reliance on non-sustainable energy resources, and in turn reduces their overall environmental footprint.

# Scope

This Guideline has been designed as a practical guide on;

* The role of environmental management in an organization’s operations.
* Compliance with the relevant environmental regulations,
* Importance of identifying environmental aspects that an organisation can control, as well as those environmental aspects that it can be expected to influence,
* The development and implementation environmental management tools such as Environmental Management Systems (EMS) or Environmental Management Plans (EMP), with a focus on aspects of particular relevance to AtoN authorities and services providers.
* Identifying and assessing any reasonable foreseeable risks associated with hazardous conditions attributable to AtoN operations and prevention or mitigation of such risks.
* Sustainability.
* Identifying and reducing the carbon footprint.

# References and Legislative Compliance

Protection of the environment is of paramount importance to aids to navigation (AtoN) authorities and service providers and all organizations should commit themselves to comply with all local, national and international laws, regulations, standards and codes of practice in their area of operation. AtoN authorities and service providers should refer to their local legislation for specific compliance requirements to guide their environmental management.

Governments, intergovernmental and nongovernmental organizations, major groups, the private sector and civil society, individually or collectively, have a role in environmental governance. Increased global awareness of environmental issues has meant that at the international level, multilateral environmental agreements increasingly play an important role and provide leadership. Regional organizations and bodies provide forums for policy development, environmental management implementation and information on sustainable practices. AtoN authorities and service providers should look to these as a source of information and assistance in their own environmental stewardship and where possible to identify environmental programs that could possibly be run parallel to their own activities.

# Environmental Management

Environmental Management could be classified as a system that allows an authority to work consciously, actively and systematically towards reducing environmental impact of its activities and improving its methods of interaction with the environments to minimize or eliminate negative impact on the environment.

In the broader sense, environmental management consists of a series of different, but inter-related systems that when combined, allow effective management of these environmental interactions.

Environmental management, in the broader sense, considers what aspects of an organisation’s business has the potential to impact on the environment, and how organisations can achieve their environmental obligations and performance goals.

Some key drivers of environmental management include;

* Environmental policies including senior management’s commitment to environmental compliance.
* Environmental Management Systems
* External standards and legislation that dictate the level to which an organization manages its environmental impact.
* Environmental auditing and assessments.
* Monitoring and measurement of environmental performance which identifies compliance issues and cost effective solutions as well as assisting in identifying employee training needs; and
* Environmental reporting.

## Understanding the environmental challenges

Any organization will benefit from undertaking an initial environmental review of their current operations. This can provide a starting point for an organization to identify the level of impact its activities have on the environment, what controls are currently in place and what actual levels of controls or procedures are required.

It is also a valuable tool in identifying ways to increase the sustainability of its operations and where appropriate to assess its carbon footprint and respond accordingly.

The review provides data and information that is crucial in development of policies, systems, guidelines and procedures and planning in general.

## The Commercial Aspects of Environmental Management

Environmental Management Policy

There is a false impression that increasing the level of environmental controls will increase the cost of doing AtoN work or proving AtoN services. In fact, the result can be just the opposite and engineering solutions, methodologies and procedures that reduce the impact on the environment can actually reduce AtoN costs.

Effective environmental management strategies will allow an organization to focus on more sustainable ways of operating, reduce level of wastage, focus on using sustainable resources and reduce reliance on un-sustainable energy resources, promote a responsible corporate image and in general result in more efficient and cleaner operations. It reinforces an organization’s commitment in the eyes of clients, employees and members of the public.

The monetary and non-monetary costs of not pursuing an environmentally responsible approach can be much higher for an organization. These can range from bad publicity, financial liability and increasingly, to the costs of clean up or actual criminal prosecution in the event of environmental incidents or disasters. The general understanding and awareness of these issues has increased dramatically in the recent past, and as a result there is now a strong emphasis on responsible environmental stewardship, especially in marine areas. Local and global communities now have the relevant information at hand to be able to monitor the actions and impacts of authorities or service providers, putting the pressure on those entities to ensure they take their responsibilities seriously.

## Environmental Management Systems.

1. Description of an EMS

An effective way of creating and controlling the environmental ethos within an organization is through development of an Environmental Management Plan (EMP) or Environmental Management System (EMS). In this context of this document both these terms refer to the same concept and could be defined as a set of processes and practices that enable an organization to reduce its environmental impacts and increase its operating efficiency.

This type of management tool must be compliant to the relevant legislation and must be relevant to an organization’s level of environmental maturity.

A relevantly structured EMS can help an organization to reduce its negative impacts on the environment and to state and achieve their environmental obligations and performance goals and also ensure that environment management practices address local environmental concerns that impact on an organization's social license to operate.

1. Components of an EMS

Generally, an EMP/EMS provides a specific outline or policy on environmental management and what it means to an organization, the processes and environmental controls involved, and in some cases, an outline of the monitoring of the impact and effect of an organization’s interactions with the environment.

Implementation of an EMS involves an organization taking the following steps:

* Devise a policy that articulates an organization’s commitment to uphold due process.
* Adhering to relevant legislative and regulatory processes efficiently and effectively and to ensure that there is a regular review process of effects of changes in legislation , standards and regulations.
* Appoint an environmental manager or management team responsible for coordination of the EMS and also identify the environmental responsibilities of all level of employees within the organization.
* Establish environmental objectives and targets.
* Implement programs to achieve objectives and targets.
* Responsibilities and reporting structure – assign responsibilities to achieve objectives and targets.
* Identification of specific and relevant management, preventative and mitigation measures including procedures and also emergency/contingency plans.
* Identify an organization’s environmental impacts, hazards and the required controls through an environmental risk assessment and record details in an Environmental Aspects Register.
* Identification of key environments potentially affected by AtoN sites:

1. biological environment e.g. threatened ecological communities such as marine species, seabirds in the vicinity of AtoNs
2. Socio-Economic Environment e.g. fisheries, Marine Parks and Reserves
3. Social environments – traditional and cultural heritage aspects.

* Consultation and stakeholder engagement activities.
* Undertaking informed intervention action where required.
* Commitment to continually improve the effectiveness and efficiency of environmental management – review and evaluate environmental performance and correct and/or improve environmental policy including objectives and targets, as well as organizational structure, procedures and processes.
* Strategically review the continuing effectiveness of environment management within the organization

**Commitment to compliance** with applicable environmental legislation and regulations is required, along with a commitment to **continual improvement** – for which the EMP/EMS provides the framework.

Detailed information on how to implement an organization-wide environmental management system is available through the International Organization for Standardization (ISO), in their ISO 14000 family of standards.

**ISO 14001:2004 is an environmental standard which focuses on the generic requirements for an environmental management system. It provides a useful framework for an organization to follow to develop an effective, high quality EMS and summarizes the advantage an organization can expect from adopting these types of management tools.**

### Environmental Management Policies

The Environmental Policy verbalizes the organization’s commitment to be environmentally responsible. The content of the environmental policy describes the organizations aspirations, evoking the degree of commitment by top management and serving as a beacon to influence the behavior and actions of all members of the organization to high achievement for environmental protection.

The content of an environmental management policy describes the aspirations of the organization in regards to reducing the impact of its operations on the environment.

Due to increasing complexity and understanding of environmental issues, policies may refer to specific issues, such as sustainability, waste management, habitat protection but basically, the content and direction of the policies should be dictated by the organization.

Policies should create the basis for further development of environmental management plans, systems and any other documentation that is required to guide this aspect of an organizations activities.

A policy should express commitment to the relevant legislation, laws, standards or codes practice to ensure compliance.

Environmental policies should be communicated to all employees, managers, and stakeholders. All personnel should understand their role in supporting these policies, and should receive proper training in this regard.

In summary, environmental policy should cover some key issues:

* Implementation of policy
* Review – environmental objectives and actions
* Compliance – with all relevant environmental legislation and regulations
* Awareness – promoting environmental awareness and improved performance
* Partnerships and Consultation – with wider community, relevant agencies, land managers
* Communication – educating public and stakeholders

### Environmental Aspects

An organization needs to identify those activities and aspects that have actual and potential environmental impacts. An environmental review, or assessment, should be conducted by senior management and staff who are or will be assigned roles in environmental significant activities. The review can involve drawing information from a number of different areas such as legislation and policies, performance audits, monitoring and the assessment and management program.

ISO14001 stats that an environmental aspect is an 'element of an organization's activities, products or services that can interact with the environment'.

Once environmental aspects are identified, an organization should then prioritize the high risk activities and provide appropriate controls to mitigate any resulting impact.

### Controlling legislation and standards

An organization's activities may be affected by a number of different laws, legislations or governing standards. An organization should identify which of these influence their environmental management and should develop and promulgate an understanding of the consequences of non-compliance.

The impact of humans on the environment also extends beyond local, state and even national boundaries and has global repercussions. Some pollution issues are better resolved if a global perspective is adopted and international treaties, conventions, recommendations and protocols often overlap an organization's activities and exert some influence on the level of control which legislation specifies.

### Objectives & targets

An organization's EMS should state quantifiable environmental targets, that can be communicated clearly to the workforce and that can be tracked through regular monitoring. The objectives and targets should reflect an organizations operational and environmental maturity and should be revised and changed as targets are achieved.

### Roles & Responsibilities

An EMS should clearly state the roles and responsibilities of all staff relating to the environmental management framework. It should state not only the physical responsibilities, but also the responsibilities in reviewing, providing feedback and also fostering the general attitude of responsible environmental stewardship.

### Communication

Communication and feedback from the workforce and from all personnel interacting with the EMS is a critical area and an organization should have in place a framework whereby all levels of employees are encouraged to provide feedback, review and comments on the effectiveness of the EMS. Engaging the workforce ensures that the EMS is effective, efficient and most of all responsive. This process can take shape via a number of methods, such as awareness sessions, feedback forms, seminars or environmental training.

### Management measures, controls and procedures

### The identification of environmental aspects and the resultant risk assessment process will identify a company's environmental impacts and will allow prioritization of those impacts. The control measures identified will highlight critical areas of environmental management, which should be further addressed depending on the severity of impact. Written controls, procedures, instructions or other documentation outlining the approach to managing those impacts should be provided, to ensure there is a holistic approach taken.

### 

#### Waste Management

In any organization, the uncontrolled generation of waste has the potential to create environmental damage and goes directly against the principles of sustainable operations. Waste should be managed for a number of key reasons;

* To conserve resources of water, energy and raw materials
* To minimize pollution of land, air and water
* To enhance business performance and maintain corporate social responsibility and
* To improve occupational Health & Safety

#### Hazardous Substances

An organisation must identify and adequately manage environmental hazards including wastes or contaminants entering the immediate environment, damage to the sea bed and vegetation, marine pests, wildlife disturbance and noise. Potentially, an organisation may have to deal with a wide range of these hazardous substances, and as well as multiple hazards in individual sites. These hazards may also arise at varying times or interact to produce a number of unwanted outcomes.

It is important an organisation:

* identifies hazardous substances which present a risk to within the site and adjacent to the site
* determines the likelihood of the hazard occurring and the impact of its consequence
* determines the level of risk (low –moderate-significant-high risk), and
* ensures there are control measures in place to manage the hazardous substances including relevant legislative framework, management plans, detailed research, routine operating procedures, a register of clearly identified sites, and policies and international laws.

#### Erosion Management

Erosion management includes prevention, mitigation and remediation of soil erosion at AtoN sites. A suite of erosion management measures may include:

* prevention – reduce the likelihood of erosion initiating by increasing awareness of erosion processes, causes, impacts and treatment options. For example, restricting vehicle movements during wet conditions
* remediation – reduce the on-site and off-site impacts of erosion through remediation of active erosion sites e.g. revegetation, earthworks and structures
* coordinate, monitor and evaluate plan implementation and achievements
* minimise on-site and off-site impacts of erosion at times of natural disturbance: fire, flood, drought, cyclones, and earth quakes
* communication – educate personnel on the causes and impacts of erosion on-site and off-site.

Installation of erosion and sediment control measures should take into account site conditions including:

* soil type and erodibility potential
* slope
* rainfall frequency and intensity
* catchment size and therefore required capacity and coordination of control structures
* vegetation cover; and
* proximity to sensitive environments

#### Habitat Protection / Protection of Flora and Fauna

As part of responsible environmental stewardship, an organisation should take into account habitat protection or biodiversity conservation including terrestrial and marine ecosystems, and flora and fauna communities which may be affected by AtoN infrastructure or operational activities.

Terrestrial ecosystems are generally recognised by the characteristic vegetation they support, for example; type of grasslands, forests, heathlands, inland waters and coasts.

Marine ecosystems are the combination of the animals and plants which depend on each other in some way that make up marine communities, and the physical environment that supports them.

A number of conservation and sustainable environmental practices may be implemented:

- ensure compliance with relevant government legislative framework and policies and any international agreements or treaties on protection of native plant and animal species.

* provide a risk assessment and mitigation strategies for existing flora and fauna.
* establish a baseline inventory of present flora and fauna and any threatened species
* identify sites regarded as significant breeding and nesting sites for year round resident birds or migratory birds or marine creatures where special care must be taken at sensitive times to not disturb nesting and foraging
* consider any quarantine management measures imposed by regulatory authorities and how they impact on AtoN procedures, specifications, roles and responsibilities of personnel. Identify changes to operational activities or processes that could have an impact on quarantine, and define and implement measures to minimise quarantine risks

- ensure an appropriate policy is in place for managing established or introduced weeds

#### Material Life Cycle

Material life cycle is the life cycle of a product or service. As environmental awareness increases and community expectations grow, organizations need to move beyond compliance to pollution prevention strategies and environmental management systems that will improve their performance. Part of the process is to manage the total material life cycle of their products and services towards more sustainable consumption and production.

Material life cycle assessment (also known as life cycle analysis, cradle-to-grave-analysis) is the environmental impact of a given product or service throughout its lifespan including raw material extraction, manufacture, distribution, use, pollution caused by usage (e.g. greenhouse gases, depletion of fossil fuels), ultimate product disposal and material transportation. The goal is to provide a more accurate picture of the true environmental trade-offs in product and process selection, to optimize the environmental performance of a single product or to optimize the environmental performance of an organisation.

#### Protection of Flora and Fauna – see above

#### Social Responsibility - Traditional and Cultural Heritage

An organisation’s attitudes and environmental management practices at the operational level can have a profound effect on local traditional communities, and play an important role in shaping the relationship between an organisation and the communities affected by its operations.

Practical measures may include:

* ensure compliance with relevant legislative framework concerned with all aspects of the protection and conservation of environmental heritage, including AtoN infrastructure, works, places or relics that are identified as of historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance
* undertake appropriate consultation & community impact assessment for changes to existing AtoN infrastructure, applicable new infrastructure and relevant operational activities. Community consultation may involve a range of methodologies such as cultural mapping, oral histories, archival documentation and specific information provided by the community.
* identify interested community groups or local traditional community
* take reasonable precautions to identify, protect, conserve and address traditional and cultural heritage issues arising from activity
* provide appropriate mitigation or protection to sites prior to activities
* check that any permit requirements governing cultural heritage management are secured prior to disturbance of any known cultural heritage site and following consultation with local traditional community
* assess any cultural heritage issues arising using protocols and policies
* establish a suitable induction program to ensure relevant personnel are aware of their responsibilities concerning sites and operational activities at any identified cultural heritage site.

An induction program could be developed in consultation with local traditional communities and include:

* cultural awareness
* significance of cultural heritage to local traditional community stakeholders
* relevant cultural heritage legislation
* roles and responsibilities regarding the protection and management of cultural heritage
* work activity pack which identifies location of cultural heritage sites and any constraint / control plans and operation notes, details of personnel to contact if a problem occurs at a site, and a detailed description of relevant acts and legal responsibilities

### Environmental Performance Reporting

Environmental reporting is a public record and can be considered as an ‘open window’ of an organisation’s environmental performance on regulatory compliance, pollution control and corporate stewardship. It is also a significant tool for environmental communication to employees, stakeholders and the public in a transparent and accountable way. It conveys the major impacts an organisation has on the environment, the resources it uses, and the waste it generates.

Generally, environmental reporting should be published annually, and should communicate some key elements of an organisation’s environmental performance:

1. **Organisational structure** to reflect the size, location, number of employees and core business of an organisation.
2. **Environmental policy** to show how the organisation is committed to meeting its environmental responsibilities. The policy should have a vision and mission statement or pledge which states the determination of the organisation to achieve its environmental policies and objectives:

* identify the organisation’s guiding principles in relation to the environment
* show how the organization is committed to minimizing its environmental impacts and making a positive improvement to the environment,
* adopt the internationally recognized standard ISO 14001 certification which serves to highlight the organisation’s commitment and due diligence to environmental best practice
* provide contact / position details of the person responsible for implementing the policy.

1. **Objectives and Targets** assist an organisation fulfill their environmental commitments stated in the environmental policy and in effect, use resources more efficiently, reduce operating costs and improve overall performance

* An objective is a specific environmental goal the organisation has set that can be quantified and tracked over time. This enables progress in meeting objectives to be monitored. For example, ‘To reduce energy consumption where feasible’.
* A target is a detailed performance requirement that is *Specific Measurable Attainable Relevant Trackable* (SMART). For example, ‘To reduce energy consumption by 10% by the next reporting period’.

1. **Indicators** present the information on how an organisation achieves objectives and targets, and tracks inputs and outputs in a visually attractive and understandable way. They help stakeholders see right away what the major environmental impacts are, and how the organisation is working to minimise negative and encourage positive environmental effects.

* Inputs - indicators are commonly developed for inputs of energy, water, and raw materials that an organisation uses in producing products or services. For example, how much energy and water an organization use, types of energy used and for what purpose, and what actions an organization can take to reduce consumption.
* Outputs - indicators are commonly developed for outputs such as solid, liquid and gaseous waste, and the amount of waste recycled or reused. An organization should identify waste generation and identify opportunities for recycling and reuse of materials. For example, consider the forms and quantities of waste generated, the disposal methods used and what materials are recycled, or reused.

1. **Major Environmental Impacts** indicate how the organisation’s operational activities may impact on the environment. An organization should identify the source of all pollutants and potential pollutants, the environmental factors which may be impacted and document measures to manage and/or mitigate the impacts on the environment.

Three main issues should be addressed:

* conduct an initial review of an organisation’s activities, and how the organisation interacts with the environment;
* analyse and consider an organisation’s significant environmental impacts and what the impact results are: greenhouse gasemissions; releases to water; waste management; contamination of land (soil and associated ground and surface waters);regulatory compliance, guidelines and codes of practice; and other local environmental and community issues.
* prioritise impacts– consider the scale of the impact; severity of the impact; probability of its occurrence; and duration of the impact.

1. **Commitment to employees and the community** details and demonstrates an organisations commitment to employees and the community. Possible initiatives may include:

* staff development and training - time spent in training/educating per employee or measured by dollar value per employee
* stakeholder consultation – who, how and what the community want
* collaborative projects or partnerships with community organisations - list partnerships; how projects meet the community’s needs as identified in stakeholder consultation; amount of employee time donated to community partnerships and project support
* feedback - external stakeholder feedback on community partnerships and project support; employee feedback on satisfaction with employer
* sponsorship
* school assistance programs

### Environmental Emergency Response

The objective of an environmental emergency response (EER) is to ensure incident planning and response procedures are managed effectively during AtoN operational activities and to outline the general procedures for initiating an emergency response that could occur as a result of AtoN works or natural causes. An EER should also provide guidance on the subsequent management and communications in response to, potential and actual emergencies which may occur on or impact an organisation’s AtoN activities.

In the event of changed circumstances, any planned control measures should be reviewed, risk assessed and, where appropriate and practical, amended as necessary prior to commencing new or modified activities.

An EER plan should detail:

* an organisation’s security and public safety issues
* effective spill containment and management
* effective fire fighting capabilities
* effective response to emergencies and critical incidents
* a single set of emergency procedures, consistent with the existing organisation’s Emergency Plan, that can be scaled as appropriate for any incident or emergency.
* an incident reporting procedure which details timeframes and documentation required. An environmental incident should be reported as soon as practicable to an organisation’s environmental representative. For example, the incident should be reported within 12 hours of becoming aware of the incident. A full written detail of the incident should be provided with seven days of the date on which the incident occurred.

All incidents should be investigated and the appropriate course of action taken to address the issues. Environmental incidents that harm or are likely to harm the environment should be reported to the relevant government authority.

### Monitoring

An organization should aim to conduct activities in an environmentally responsible manner and implement best practice environmental management as part of a program of continuous improvement. This commitment to continuous improvement means an organisation should review an Environment Management Plan (EMP) every five years and more often as required (e.g. in response to new information).

Reviews should address matters such as the overall design and effectiveness of the EMP, if works are not appropriately covered by the Plan, or measures are identified to improve the plan.

An EMP should include a schedule which identifies what actions will be monitored, by whom, the frequency and the responsible sign-off person to confirm monitoring has been undertaken. Monitoring procedures, forms and checklists may be required and legislative requirements and licence standards/or exposure standard limits (e.g. dust emissions), if existing, listed and the metrics for measurement clearly stated. Any contingency plans, preventive or corrective action procedures should be identified and detailed in the plan to mitigate failures identified through monitoring.

Example: A simple waste schedule will allow weekly or monthly waste data (from each waste stream on site) to be recorded and compared to any targets set. The metrics for reporting should relate the amount of waste created, recycled and land filled to the amount of production e.g. total waste / unit production; recycled waste / unit production etc. This will assist in tracking the efficiency of any measures implemented to reduce or better manage waste. Monthly reporting to senior management will assist in evaluating overall progress and provide a basis for review and improvement decisions if necessary.

### Audits

An internal audit schedule should be developed and maintained that includes audits on an organisation’s environmental performance and compliance. The general procedure should include:

* record and maintain all internal audits and the audit outcomes
* track actions arising from internal audits until their close-out
* facilitate audits and/or inspections by external regulations. The findings of external regulatory audits to be recorded and actions and/or recommendation addressed and tracked
* submit a compliance assessment report annually to address the previous 12-month period
* submit an audit compliance report on an annual basis for the previous 12-month period.

### Performance Evaluation

Environmental performance indicators must be specific, measurable, attainable, relevant and time-framed (SMART) and relate to organisational practices and procedures. For example, an organization should clearly identify in a plan or schedule its environmental objectives, what the actions are against each objective and how they will be measured i.e. the target indicator.

SMART Example 1:

Objective - continue to develop effective tools and systems to manage environmental responsibilities

Action - maintain and continually improve an organisation’s EMS

Target - management review of EMS annually

SMART Example 2:

Objective - an environmentally aware and committed workforce

Action - rolling program of targeted environmental training for staff

Target - identify number of staff trained every year

Some potential indicators which may be used to track significant environmental effects of an organization include:

* environmental training – no. of staff given environmental training
* organisations’s environmental management plan (EMP) – progress against objectives and targets outlined in the EMP
* breaches of statutory instruments – total number of prosecutions and notices issued
* greenhouse gases – net greenhouse gas emissions (net tonne CO2 – equivalents)
* waste management – solid waste generated (tonnes); waste recycled or reused expressed as a % of solid waste generated
* contaminated land – number of sites under control of an organisation that present a significant risk of harm as defined by legislation
* community partnerships – value of sponsorship for community environmental projects
* financial indictors – operating costs; overall service delivery; price of AtoNs

## Reducing Environmental Impact

### Sustainability

An organisation should aim to lead the way in sustainability through everyday living practices, education and research. Some key areas an organisation can contribute to sustainability and environmental awareness are public education programs; school and community group talks; sponsorship designed to support a wide range of community and environmental activities; partnerships with the community; and public reporting on its environmental sustainability goals and obligations.

Some of the challenges faced by an organisation to meet global and environmental sustainability include:

* recycling – reduction of waste by reusing and recycling to save money on costly landfill and transport services. In addition, waste reduction and recycling campaigns ensure that an organisation is contributing to a tangible sustainable future
* managing waste streams including paper from the administration activities, construction and demolition waste from redevelopment, and hazardous substances
* using renewable energy – the use of solar panels that convert solar radiation into direct current electricity
* developing and promoting a culture of environmental leadership, responsibility and continual improvement
* auditing, monitoring and ensuring compliance with relevant legislative and regulatory obligations and other environmental commitments
* leading the way in defining and achieving best environmental practice and adopting international standard
* advancing and disseminating environmental knowledge and applied environmental management through, training and engagement with the wider community.

### Carbon Omissions / Carbon Control – Greenhouse Gas Emissions

Carbon omissions refers to the release of polluting carbon compounds into the atmosphere, most commonly attributed to human activity such as burning fossil fuels. Carbon omissions are usually measured in metric tons.

A **carbon footprint** has historically been defined as "the total set of [greenhouse gas](http://en.wikipedia.org/wiki/Greenhouse_gas) (GHG) emissions caused by an organization, event, product or person.

This issue has become an issue of global interest, due to debate over global warming.

An organisation should consider:

* a Greenhouse Gas Emissions Strategy including initiatives that will offset greenhouse gas emissions
* an incentive program to take up fuel efficient fleet of cars•
* potential for greater use of fuel alternatives e.g. biofuels
* use of renewable energy such as solar panels that convert solar radiation into direct current electricity
* a recycled materials strategy, and
* potential to increase the amount of recycled materials used for new infrastructure projects

Apply some useful indicators:

* Greenhouse gases – net greenhouse gas emission (net tonne CO2 – equivalents)
* Electricity consumption
* Waste management – solid waste generated (tonnes)
* Waste recycled or reused expressed as a percentage of solid waste
* CO2 equivalent emission from authority vehicle fleet, tonnes per km travelled p.a.
* CO2 equivalent emissions from an organisations-related air travel, tonnes per FTE p.a.

## The Environmental Risk Assessment Process

Environmental risk management identifies credible environmental hazards, assessing the likelihood of occurrence and severity of the potential ecological and human health consequences, and managing the resulting level of risk.

An established program of cyclic risk reviews can be carried out throughout an organization with significant environmental risks addressed through the EMS.

Risk management process for AtoN sites is a continuous process and an organization should take a consultative approach with environmental managers, decision makers, industry, maintenance contractors and community stakeholders.

Ecological risk assessment involves:

* Problem formulation – establishes the context for the strategic and organizational conduct of the overall assessment
* Hazard identification
* Risk Analysis – likelihood of exposure and ecological effects
* Risk characterization
* Treatment/mitigation measures to reduce risk to acceptable levels
* Monitoring and review