

CLIMATE CHANGE

THE GIBRALTAR PROGRAMME 2008

PREPARED IN CONSULTATION WITH THE CLIMATE CHANGE FORUM



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Foreword by the Minister for the Environment

As Minister for the Environment I am pleased to present this Climate Change Programme. This programme comes as a result of the Government's commitments under the Kyoto Protocol. Gibraltar has collective EU obligations under this Protocol that are enacted through EU environmental directives. In addition to these, the Government decided to sign up to Kyoto in a more direct manner by having the UK's ratification of the Protocol extended to Gibraltar. As a result of this increased commitment, the Government presents this programme. A comprehensive package of policies geared towards decreasing our carbon footprint and promoting energy efficiency and conservation.

The Government of Gibraltar has prepared this document at a time when climate change and global warming are centre stage issues thrust onto our daily lives. Not a day goes by where these issues are not discussed by anyone and everyone. The evidence for climate change is now accepted and the UN's Intergovernmental Panel on Climate Change is continuously gathering evidence in this regard and providing definitive, authoritative advice. Global warming is therefore an issue that warrants attention. The Government recognised the need for independent scientific advice on these very important and sometimes controversial issues. This is why the Climate Change Forum was created. It consists of a technical advisory group that presents an exchange of views and information for Government, so that appropriate decisions may be made using the relevant technical and scientific underpinning. Local professionals and scientists advise Government on issues associated with climate change. In line with the vast majority of European countries, the Gibraltar Government is responding to climate change concerns and is taking action where possible to decrease our carbon footprint.

The Government realises that our limited size and resources may impede the level of action that we may be able to take. We may not be able to lead in some respects, but we must nevertheless focus on taking the right steps and making inroads wherever possible. Every contribution is significant no matter how small. The challenges lie in assessing new and exciting ways to use our unique characteristics in an environmentally acceptable manner. Striking the right balance locally is no easy task, but we must always remain focused on the goals. The guiding principles of our Environment Charter give us the basis for our goals.

Sustainable development is fundamental to decrease, if not avoid, the negative impacts we are having on this planet. There is a moral concern that our current actions will affect the ability of future generations to act and meet their own needs. The issue of *intergenerational responsibility* has been played down in the past since we, as society, were confident that the effects of our actions on the global climate were benign. The idea that those coming after us would be the privileged and grateful beneficiaries of current research, technology and investment is no longer so prevalent. Society must undergo a change, a change in attitude and lifestyle, which will help us all to strive towards a healthy and prosperous living environment.

The Government's vision for a sustainable future consists of a rich, diverse & healthy environment in Gibraltar for present and future generations to enjoy.

Contents

FOREWARD.....	2
THE STRATEGY.....	4
UNDERSTANDING CLIMATE CHANGE AND ITS EFFECTS.....	4
<i>PREDICTED EFFECTS</i>	5
THE GLOBAL REPOSNSE.....	6
THE APPROACH TO THE PROGRAMME.....	6
WORKING AS PART OF THE EUROPEAN UNION.....	7
GIBRALTAR’S CLIMATE CHANGE POLICIES.....	8
<i>LAND USE POLICY- PRESERVING OUR GREEN AREAS</i>	8
Green areas.....	8
<i>SOIL PROTECTION POLICY</i>	9
<i>ENERGY CONSERVATION POLICY – EMISSIONS REDUCTIONS</i>	9
Green roofs.....	11
Renewable energy.....	11
<i>TRANSPORT AND TRAFFIC MANAGEMENT POLICY – EMISSIONS REDUCTIONS</i>	11
<i>POLICY ON THE PROMOTION OF ENVIRONMENTAL EDUCATION AND AWARENESS – WORKING IN PARTNERSHIP WITH OUR COMMUNITY</i>	12
<i>POLICY ON WASTE MANAGEMENT – STRIKING THE BALANCE</i>	13
<i>DEVELOPMENT AND FLOOD RISK – ADAPTING TO CHANGE</i>	13
MONITORING AND REVIEW.....	14
APPENDIX A.....	15
APPENDIX B.....	18
APPENDIX C.....	25

1. Strategy

“Solutions to global problems start with local contributions”

This is the focus behind Gibraltar's Climate Change Program (GCCP). Gibraltar, like all nations around the world, strives for further economic development coupled with better standards of living. There is a delicate balance to be struck in accommodating the requirement for development whilst preserving the natural environment. The Government of Gibraltar is determined to achieve this balance and to promote sustainable development in Gibraltar.

2. Understanding climate change and its effects

Climate change refers to all types of climatic variation. The Earth's climate is never static and subject to constant (usually gradual) change. The term climate change is now used to imply a significant change from one climatic condition to another. Climate change is often used in reference to global warming. Scientists and Governments however, use the term in its wider context to include natural as well as anthropogenically-induced changes in the climate.

At a time when the global media is increasing its focus on the level of environmental (climate) change, it is easy to forget that throughout the earth's existence, its surface has been moulded by gradual and catastrophic events, which have had an undeniable impact on the atmospheric conditions and therefore the climate. These processes have been controlled by a series of natural processes, for example biogeochemical cycles which affect the transfer of materials between the atmosphere, hydrosphere, lithosphere and biosphere (air, water, soil, plants) and the inputs of solar energy. Variations in the amount of solar energy reaching the earth's surface also has an impact on global climate change and there is evidence for the most recent geological period that this is controlled by the earth's orbital forces (Mannion and Bowlby, 1996¹). It has been established that the Earth is not considered to be cooling at this time, but rather to be in a period of global warming. At least part of this warming is thought to be human-induced. This has then led to widespread concern that humans are affecting the global climate. The climate change problems predicted and being encountered around the world in recent years are perceived to be the result of an increased greenhouse effect, brought about through the release of vast amounts of carbon dioxide (CO₂) from anthropogenic activity into our atmosphere. Changes in atmospheric concentrations of greenhouse gases (GHGs) and aerosols, land-cover and solar radiation alter the energy balance of the climate system². Carbon dioxide is the most significant of the greenhouse gases. The amount of naturally produced carbon dioxide is almost perfectly balanced by the amount naturally removed. The result of humans burning fossil fuels (oil, coal and petroleum) has a definite impact on this balance. Annual emissions of CO₂ grew by about 80% between 1970 and 2004. The long-term trend of declining CO₂ emissions per unit of energy supplied reversed after

¹ Mannion, A M and Bowlby, S R 1996 “Environmental Issues in the 1990's” John Wiley and Sons Ltd

² IPCC Fourth Assessment Report, Climate Change 2007

2000³. The removal of forests such as is occurring in Brazil and the Far East further decreases the ability of the earth to remove CO₂.

The importance of the issue of climate change lies in that the climate determines how resources such as water and vegetation are dispersed. Many factors, such as topography, proximity to large bodies of water, and latitude affect a particular location's long-term climate. After consideration of such issues, the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) concluded that:

- The climate has changed over the past century.
- The balance of evidence suggests a discernible human influence on global climate.
- The climate is expected to continue to change in the future.
- There are still many uncertainties.

In light of these conclusions, the focus of this programme is on the effects of anthropogenically induced climate change, and will assess ways in which Gibraltar can realistically cut down its emissions of greenhouse gases, conserve energy and protect and enhance our natural environment.

Predicted Effects

Climate change in Europe could have profound impacts on coastal zones due to sea level rise and changes in frequency and/or intensity of storms. This would result in threats to ecosystems, infrastructure and settlements, the tourism industry and human health. Observed temperature rises and changes in precipitation patterns already affect various aspects of Europe's natural systems. Projected climate change is expected to lead to considerable losses of species and habitats throughout Europe. Changes in frequency and intensity of extreme weather and climate events could pose a serious threat to human health. These threats may either be direct, such as heat waves and flooding, or indirect, for example by the spread of tick-borne diseases. Temperature rise is likely to increase energy demand for air conditioning in the summer, particularly in southern Europe. Such extra power demand, compounded by climate change induced reduction in hydro-production and problems with cooling water availability could cause disruption to energy supplies (European Environment Agency Technical Report, No7/2005).

The predicted effects of climate change in the Western Mediterranean, in particular our region are expected to consist of a rise in temperatures, lower levels of rainfall, and a change in the intensity and distribution of the rainfall leading to a subsequent increase in floods. The effects of climate change in this region are expected to create a greater degree of unpredictability of extreme weather events, ranging from wetter winters, drier and hotter summers and heat waves. Episodes such as drought are not expected to affect the human population in Gibraltar to a very large degree, as our potable drinking water source is largely desalination. This however, may not be the case for the floral and fauna populations on the Rock. These communities are likely

³ IPCC Fourth Assessment Report, Climate Change 2007

to suffer from decreased rainfall (Department of the Environment Annual Report 2007).

Lower river flows in summer and subsequent decreased discharge of freshwater into the Bay will affect the sea temperature, salinity, CO₂, nitrate and phosphate concentrations within the marine environment. This will in turn have a knock on effect on marine flora and fauna as well as the supporting terrestrial populations. Furthermore, higher temperatures will dry soils and increase salinization and generate a higher incidence of wind blown soil erosion. Gibraltar is on a main migratory path for birds. Increasing drought in the Mediterranean would lengthen migratory journeys and increase stress to migrants (GONHS, 2005 personal communication; Department of the Environment Annual Report, 2007).

3. The global response

A large number of countries from around the World are taking action by signing up to the United Nations Framework Convention on Climate Change (UNFCCC), which was agreed at the Earth Summit in Rio de Janeiro in 1992. Under the Convention, all developed countries signatory to the Convention agreed to aim to return their greenhouse gas emissions to 1990 levels by the year 2012. The Kyoto Protocol was designed to address this need for emissions reductions, and is an important stage in what will essentially be a long-term process. Developed countries agreed to take on legally binding targets to reduce their emissions. If delivered, these targets will reduce developed countries' emissions of greenhouse gases by 5.2% below 1990 levels over the period 2008- 2012. Developed countries also know that tougher targets are likely to be needed beyond 2010, and that developing countries will need to be part of the long term global response to climate change. The EU has signed up to the Kyoto Protocol and in this way, Gibraltar is committed to establishing ways of reducing emissions as part of our contribution to the EU target. In addition to our EU Kyoto commitments, Gibraltar is also signing up to the Kyoto Protocol in a more direct manner under the United Kingdom.

4. The approach to the programme

Climate Change Programmes consists of a package of policy and or legislative instruments aimed at reducing the rising greenhouse gas emissions of a region, country or community resulting from society's ever growing energy demands. The comprehensive range of areas covered by such programmes means that they are aimed as society in general. This climate change programme builds on the groundwork done as part of the Government's Environment Charter and reflects Governments commitment to reduce, whenever and wherever possible, our greenhouse gas emissions and to conserve energy. It brings together a series of policies and measures that are already driving emission reductions in the EU and as well as a series of new initiatives that aim to curb emissions and initiate a downward trend. The programme is driven by a combination of policies introduced (or in the process of being introduced) by Government and highlights measures that need to be adopted by other key players such as the business sector and the local community. The programme includes details of some of these initiatives as a way of illustrating what could be

achieved and the benefits that could be derived there from. The programme is based on a number of basic broad principles which include:

1. Adoption of a balanced partnership approach, encouraging all sectors of the community to play their part;
2. Focus on flexible and cost effective policy options which are able to work together to form an integrated package;
3. Taking a longer term view by looking at targets beyond the EU's Kyoto commitment period and monitoring the need for Gibraltar to adapt to possible impacts of climate change;

The programme will be officially adopted by Government and policies implemented. Government departments directly or indirectly affected by the policies to be implemented will enter into discussions with the Department of the Environment to discuss implementation and if necessary monitoring strategies.

5. Working as part of the European Union

Gibraltar is committed to Kyoto both directly through an extension to the UK's ratification and indirectly under an increasing number of EU Directives. The EU has signed up as a collective community to the UNFCCC and its Kyoto protocol. In order for the EU to meet its collective target under the Kyoto Protocol, various EU Directives have been issued, that compel Member States to take action at different levels. The measures that we are required to take vary in degree, applicability to our local setting and practicality of delivery, depending on the Directive in question. Due to Gibraltar's limited size and obvious limitations in a number of critical areas, in some cases the best that we may be able to strive for is to do "as much as can reasonably be expected" although this will, in no way, limit us to strive to achieve our ultimate goal.

The following Directives are but a few which have emerged through the EU policy on environmental protection and its Climate Change Programme, the aim of which being to introduce a wide range of measures that promote energy efficiency and tackle rising greenhouse gas emissions:

- Biofuels Directive 2003/30/EC
- EU Renewables Directive 2001/77/EC
- Emissions Ceilings Directive 2001/81/EC
- Greenhouse Gas Emissions Trading Directive 2003/87/EC
- The Linking Directive 2004/101/EC
- Directive on promotion of cogeneration based on a useful heat demand in the internal energy market 2004/8/EC
- Directive on the energy performance of buildings 2002/91/EC
- The Landfill of Waste 1999/31/EC
- Substances that deplete the ozone layer Regulation 2037/2000, 3093/94
- Integrated Pollution Prevention and Control 96/61/EC
- Environmental Liability Directive 2004/35/CE
- Substances that deplete the ozone layer. Regulation 2037/2000, 3093/94
- Habitats Directive 92/43/EEC
- Directive 2005/32/EC on Energy Using Products

- Directive 2006/32/EC on energy end use efficiency and energy services

Gibraltar complies (or is in the process of complying) with all these (and other) Directives. Under our National Allocation Plan for the Greenhouse Gas Emissions Trading Directive (2003/87/EC), the Government is committed to undertake a number of measures that aim at reducing our greenhouse gas emissions. The National Allocation Plan shows that our emissions are expected to increase over the period 2008-2012 if our social and economic development is not to be curbed. We are nevertheless currently looking at modernising our power generating facilities to take account of best available technologies. A number of measures, listed below, have already been taken which although not quantifiable at this present time should help us to reduce our CO₂ emissions, if not minimise the level of increase.

These are:-

1. An ongoing modernisation programme of all our fresh water distribution system that will result in leakage reduction. Since most of Gibraltar's potable water is produced by desalination, any leakage reduction will result in a saving in energy.
2. Encouragement of waste reduction and introduction of further recycling, aimed at reducing the amount of municipal waste going to landfill, thereby reducing amounts of methane and other greenhouse gases arising from this practise.
3. The recent introduction of a new modern bus transport system. School children can already travel free to and from school thus reducing dependence on parents having to drive them to school in private vehicles.
4. The continued use of seawater instead of fresh water for the conveyance of sewage and for other purposes such as fire fighting e.g. where the use of potable water is not essential. Since most of Gibraltar's potable water is produced by desalination this measure results in a considerable saving in energy.
5. The planting of thousands of trees at the eastside sand slopes will help to reduce our carbon footprint and provide Gibraltar with a new woodland.

6. Gibraltar's Climate Change Policies

a) Land Use policy- preserving our green areas

Green areas

This policy focuses on the preservation of all our green areas whenever and wherever possible, as well as the creation of further green areas, particularly within dense urban locations. Where green areas are not possible, the use of stand-alone trees will be required to provide a certain amount of 'greenery' in all new developments.

Trees and green areas make a valuable contribution towards the appearance of an area as well as being of significant ecological value. The Government therefore wishes to retain such features wherever possible. The two largest concentrations of tree areas are the Upper Rock and Alameda Gardens, which have specific policies that are set out in the respective sections of the consultation draft Gibraltar Development Plan 2007. The Upper Rock and Windmill Hill Flats have now been officially designated as Sites of Community Importance (SCIs) by the EC under the Habitats Directive (92/43/EEC). Furthermore, the Department of the Environment, in conjunction with

the Planning Department and the Development and Planning Commission, is considering a blanket protection policy for all trees in Gibraltar. In support of this and as a further environmental gain, the Development and Planning Commission have a working practice/policy whereby they require two trees to be planted for every tree, which is cut down.

b) Soil protection policy

Soil is a very scarce resource and it is therefore important to ensure that it is properly managed. The aim of this policy is to provide a framework for the protection of soil and the reservation of the capacity of soil to perform the following environmental functions:

- (a) biomass production, including in agriculture and forestry;
- (b) storing, filtering and transforming nutrients, substances and water;
- (c) biodiversity pool, such as habitats, species and genes;
- (d) acting as carbon pool;

To that end, it aims to lay down measures for the prevention of soil degradation processes, both occurring naturally and caused by a wide range of human activities, which undermine the capacity of a soil to perform those functions. Such measures include the mitigation of the effects of those processes, and the restoration and remediation of degraded soils to a level of functionality consistent at least with the current and approved future use.

Gibraltar's unique circumstance means that the main concern in relation to soil is its loss as opposed to its degradation. In this context developments, which would involve the removal of significant amounts of soil, will be discouraged. Where such a development goes ahead, every effort should be made to find a beneficial use for the removed soil. One of the most obvious uses for such soil is in landscaping schemes either related to the development or for general landscaping purposes. Applicants will be expected, in appropriate cases, to demonstrate that they have given serious consideration to the re-use of soil removed from the development sites.

The aim of this policy is the reuse as well as the preservation of soil. The disturbance or destruction of soils would be minimised, if not avoided, whenever possible. Traditional 'dig and dump' practises would be prohibited and substituted with 'dig and reuse' practises. When the soil area constitutes a small portion of a site, development could be aimed around such areas, and those areas in turn, planted and developed into green areas within the development. When the soil areas constitute a large portion of the site, careful planning should ensure that as many 'pockets' as possible are preserved. Sections of the site that are to be built on should have the soil removed and seeded on another site.

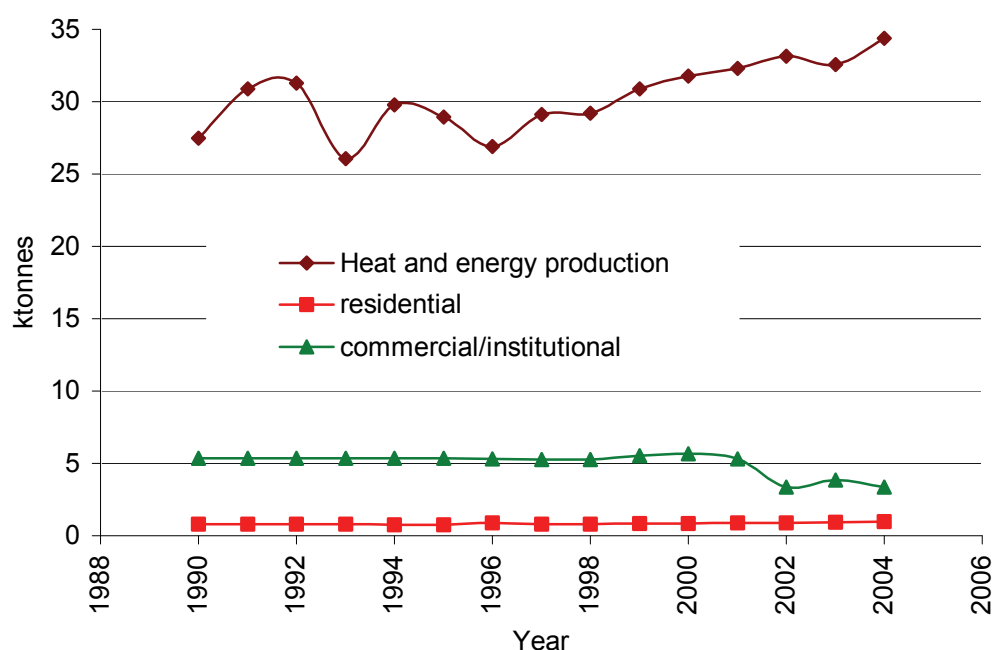
c) Energy Conservation policy – emissions reductions

The national energy policy aims to reduce emissions and save energy through the promotion/adoption of energy saving measures wherever possible. Energy demands are anticipated on the basis of future development projects mainly community projects such as new housing etc. However because of Gibraltar's small size a single

community project will have a significant impact on energy demand. As a result of this, the policy will tackle various factors. One of the most notable ones will be aimed at the insulation of buildings, in other words preventing the heat (in winter) and coldness (in summer) loss from buildings by maximising the energy efficiency of new buildings. This includes pre-requisites on the types of materials used in the design, construction and furnishing of the buildings. The design of the structure will also be required to be such, that it would maximise the energy efficiency of the edifice for example the amount of sunlight entering the building. Insulation and double glazed windows are further requirements. The introduction of energy efficient measures into buildings can contribute towards energy savings through the reduction in the use of natural resources for power generation and reducing greenhouse gas emissions. The Government of Gibraltar will require that the designs of future installations are based on technologies and materials that are environmentally sustainable, achieve maximum energy savings and emissions reductions whilst being cost effective. This policy will be adopted to meet our obligations under Directive 2002/91/EC on the energy performance of buildings.

In new developments such measures would be taken into consideration at an early stage of the design process. In some cases energy efficient measures may have a consequence in terms of the visual impact and affect on the character of the area. In such cases the relative environmental benefits will have to be weighed up against the impact on the surrounding environment. In addition to this, Government will promote better energy efficiency in the domestic and commercial sectors.

Graph 1 - Carbon emissions from various energy sources in Gibraltar



Government will seek to ensure that the public sector takes a leading role by:

- Setting new targets for improving energy management of public buildings;
- Introducing energy efficiency targets for local authorities and department, schools and hospitals; and
- Developing green travel plans.

The Government of Gibraltar is developing an energy efficiency action plan to deliver energy savings throughout our community.

Green Roofs

The Government recognises that in appropriate cases the introduction of green roofs can be of social, environmental and economic benefit. Green roofs can reduce operational costs through energy efficiency and provide new sources of amenity and recreational space. They also contribute towards a healthier environment. In appropriate cases therefore the Government will encourage proposals to incorporate green roofs into development proposals. Green roofs will be of particular relevance in developments that are situated in close proximity to natural areas, in particular the Upper Rock, and where they will serve to minimise the visual impact of proposed development as well as help maintain the ecological value of the area.

Renewable energy

Renewable energy covers those sources of energy, other than fossil fuel or nuclear fuel, which are continuously and sustainably available in our environment. There are various international agreements that aim to reduce energy consumption and promote renewable energy.

Government appointed consultants to assess the feasibility options for local renewable energy generation. The study assessed what renewable energy options were viable locally and what the expected generated output of each option would be in relation to Gibraltar's growing energy demands. Large-scale proposals, by their very nature, could potentially have a significant impact on the environment particularly as Gibraltar is such a small area. When considering proposals for renewable energy schemes a balance has to be struck between the impact of the proposal and its wider environmental benefits. The study focused on Gibraltar's atypical environmental setting. As a result of the renewable energy resource review, it has been concluded that there are three options worthy of further consideration, in other words, they are the only ones considered technically viable for Gibraltar. These are:

- 1) Wind energy
 - Offshore
 - Onshore
- 2) Energy from Waste
- 3) Tidal current

d) Transport and traffic management policy – emissions reductions

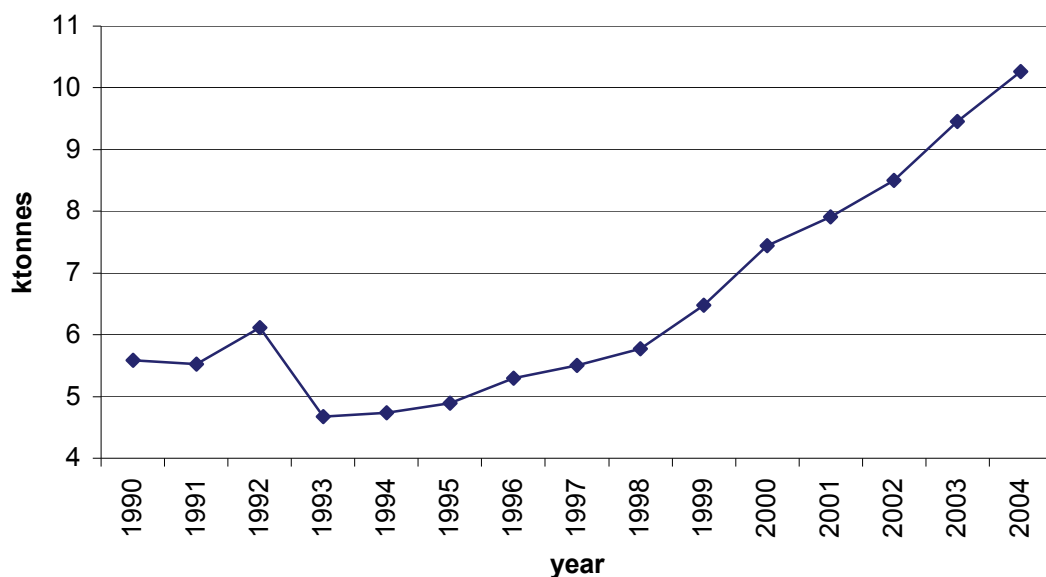
Carbon and nitrogen dioxide emissions from road transport are on the increase whilst methane emissions from this source have decreased (Graph 2, Table 2 in Appendix A). This policy aims to reduce emissions from transport, principally by decreasing the need to have the growing number of private vehicles on the road through an

increase in public transport. One of the ways to achieve this is by increasing the hours of service of the local buses. Any gaps in the service in terms of catchment areas not facilitated by the current set up will be assessed. The procurement of Government vehicles will also include environmental considerations.

Increasing the number of parking spaces in key areas will help to reduce congestion on the road. Visitors compete for parking with residents, as well as generating traffic on our streets. Government will build a large (1000 space) car park, with an accompanying ‘park & ride’ bus shuttle service into town, for the use of visitors, commuting workers and residents alike. This scheme will, by itself, make large inroads into our parking and traffic circulation issues, as well having an effect on local air quality.

The greatest contribution to decreasing carbon emissions from this source is by implementing a series of policy changes as opposed to one single policy. Government will periodically review all policies and measures implemented to ensure that we achieve the greatest emissions reductions possible.

Graph 2 - Carbon produced from Road transportation



e) Policy on the promotion of environmental education and awareness – working in partnership with our community

Awareness is crucial to our ability to reduce greenhouse gas sources and emissions, as well as the preservation of our greenhouse gas sinks. The environmental education programme that the Department of the Environment has embarked upon, in conjunction with the evolution of the Green Business Programme (presentation held during Green Business Seminar in Appendix B), aimed at increasing awareness and instilling a sense of civic pride towards our environment. Yearly programmes on different topics will be the focus of our visits to all local schools. In addition to this,

the Government will be launching public awareness campaigns throughout the year, using the local media to spread green messages on specific issues.

f) Policy on waste management – striking the balance

Policies on waste management need to focus on increasing our level of self-sufficiency in our waste management processes. Waste reduction is therefore a prime factor in this process. Waste policies will focus on the promotion of methods such as energy from waste. Presently, emissions from incineration are at zero level due to the fact that the current plant has not been operational for some time. This will change with the new clinical waste incinerator, which has come into operation. Policies will rely on emissions reductions through the requirement for Best Available Technology (BAT) and specific pollution abatement techniques.

The handling of waste by the general public is another issue which will be addressed with the intention being to better inform the public on how to manage their waste more efficiently by way of reducing volumes through flat packing cartons, boxes etc, and by the separation of certain waste items into their respective streams i.e. electrical and electronic items, bulky items, ink cartridges, batteries etc. Such actions will be supplemented and encouraged through public awareness campaigns. Systems are being put in place to allow for this. The reuse of certain items of waste will also be encouraged, thereby prolonging their life spans. Government will establish an Environment Park that will facilitate the disposal of differing waste streams.

g) Development and flood risk – adapting to change

Current research shows that the central value of 0.48m that is currently being adopted by the Technical Services Department is within the updated predictions of the *Climate change 2007: IPCC fourth Assessment Report*. The best estimates for sea-level rise due to ocean expansion and glacier melt by the end of the century (compared to 1989 - 1999 levels) have narrowed to 28 - 58 cm as opposed to 9 - 88 cm quoted in the previous *Climate change 2001: Third Assessment Report*. In the light of the available evidence the value of 0.48m is a reasonable figure to apply. Despite the low-lying nature of many parts of Gibraltar the potential for inundation by the sea remains low although there will inevitably result an increased risk of over-topping and storm damage being occasioned to its sea defence structures. There is an increased risk of temporary flooding of low lying areas away from the sea due to the increased depth of sea outfalls resulting from projected sea level rise. Much of Gibraltar's low-lying land is situated at the North Front and the Westside reclamation areas, the latter within the protected harbour area. Additionally strips of land at risk of flooding include Queensway and Catalan Bay. Although specific areas within the harbour may be susceptible to large swells, this area is generally considered to be at low risk. The more exposed areas of Gibraltar's shoreline, particularly the southern and eastern sides that do not benefit from the relative protection of the Bay of Gibraltar, are considered to be at greater risk, although still low.

Where development is proposed in areas considered to be at risk, the applicant will need to demonstrate how the proposed development shall be protected from

inundation. Consideration will need to be given to the environmental effect of any coastal defence works that are required, including possible secondary effects elsewhere along the coast.

7. Monitoring and Review

The GCCP is to be reviewed and if necessary updated not later than every 10 years, if deemed necessary by the representatives of the local Climate Change Forum. The forum will act as a technical advisory group (TAG) and consists of local professionals, scientists and Government officials alike. A TAG is a team that provides ongoing technical, scientific and managerial advice to Government on policy development and implementation. It is essentially an independent advisory forum whose recommendations are not obligatory but nevertheless carry substantial weight with decision-makers. It maintains transparency in its processes and establishes and maintains an open working relationship with Government.

The TAG has been appointed because Government recognises a need for ongoing access to independent, specialist advice on climate change and more particularly how this is likely to impact locally. Its objective is therefore to provide an exchange of views and information for Government, so that appropriate decisions are made using the relevant technical and scientific underpinning. Making decisions about changes in our climate is however a complicated matter. Decision making in this case has to deal with uncertainties and taking an objective, but informed, view the risk with due consideration being given to the possible consequences, their likelihood of the occurrence and society's attitude towards risk. It is precisely such issues that the TAG will be providing advice on in as much as these relate to our immediate environment.

The forum shall meet no less than twice a year to discuss issues of concern and to consider emerging evidence in relation to global, regional and local climate change. Any work and/or research conducted by members of the forum will aid in the development of policies.

APPENDIX A

Gibraltar Greenhouse Gas Emissions Summary (Units = ktonnes)

Key: red = overall trend and outcome between 1990 and 2004 increase
orange = overall trend and outcome between 1990 & 2004 stable
green = overall trend and outcome between 1990 and 2004 decrease

Table 1 Public Electricity & Heat Production

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Carbon	27.491	30.877	31.292	26.042	29.798	28.959	26.905	29.100	29.221	30.902	31.773	32.286	33.163	32.575	34.364
CH4	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
N2O	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001

Table 2 Road Transportation

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Carbon	5.588	5.529	6.114	4.674	4.733	4.892	5.296	5.505	5.774	6.474	7.442	7.908	8.497	9.460	10.265
CH4	0.008	0.009	0.010	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
N2O	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.005	0.005	0.006	0.006

Table 3 International Marine

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Carbon	20.849	24.035	29.968	26.265	26.010	23.276	27.695	29.669	36.306	40.045	40.542	40.715	46.571	51.956	57.333
CH4	0.007	0.008	0.010	0.009	0.009	0.008	0.009	0.010	0.012	0.013	0.013	0.013	0.015	0.017	0.019
N2O	0.005	0.005	0.007	0.006	0.006	0.005	0.005	0.006	0.007	0.008	0.009	0.009	0.011	0.012	0.013

Table 4 Commercial/Institutional

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Carbon	5.364	5.361	5.358	5.354	5.341	5.336	5.327	5.287	5.261	5.548	5.643	5.289	3.348	3.830	3.379
CH4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N2O	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 5 Residential

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Carbon	0.796	0.804	0.815	0.816	0.763	0.755	0.867	0.799	0.817	0.827	0.843	0.907	0.904	0.938	0.960
CH4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N2O	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 6 Other Mobile (Shipping, Naval)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Carbon	0.646	0.638	0.638	0.638	0.638	0.638	0.638	0.638	0.638	0.638	0.638	0.638	0.638	0.638	0.638
CH4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N2O	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 7 Refrigeration and Air Conditioning Equipment

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
HFC	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.003	0.003
PFC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 8 Foam Blowing

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
HFC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 9 Fire Extinguishers

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
HFC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PFC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 10 Aerosols

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
HFC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001

Table 11 Other (semiconductors electrical sporting goods)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
PFC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SF6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 12 Waste Incineration

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Carbon	0.000	1.230	1.230	1.230	1.418	1.425	1.448	1.455	1.523	1.523	1.807	0.000	0.000	0.000	0.000
CH4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N2O	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000

Table 13 Aviation, International TOL (civil)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Carbon	1.635	1.195	1.084	0.993	0.866	0.889	0.817	0.913	0.944	1.011	1.052	1.142	1.190	1.413	1.660
CH4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N2O	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 14 Aviation, International TOL (military)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Carbon	1.716	1.485	1.253	1.021	0.789	0.557	0.325	0.325	0.325	0.325	0.325	0.325	0.325	0.287	0.250
CH4	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N2O	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

APPENDIX B Introduction to Green Business policies within Government Departments

The Green Business Program is an attempt by Government to tackle growing concerns over issues related to climate change, touching on issues such as water consumption, energy efficiency, waste disposal and pollution of the living environment. It is hoped that the adoption of sustainable or greener practices within Government Departments will lead to similar practices being adopted by the private sector and industry in general. This will be a major incentive in the ongoing Government attempt to improve quality of life.

The idea of becoming environmentally friendly is nothing new and has been a goal for many businesses since the late 1980s, following immense pressure from the environmental movement at the time. In Gibraltar there has been a general lack of awareness on this issue. It seems as if businesses have generally mistaken sustainable business management as a principle that is not compatible with their daily undertakings, or as someone once put it, an idea that only hippies endorse.

The reality is of course, as with many things in life, totally different. Addressing the environment is increasingly being incorporated into the overall framework of management due to its clear-cut advantages.

Rise of Green Businesses

Over 50% of the FTSE 250 companies are already producing environmental reports and improving their environmental performance. The UK Government has also recently embarked on a new initiative aimed at significantly improving environmental performance within Government Departments under the banner of sustainable development. More detailed information on this initiative is available online from the website:

http://www.gibraltar.gov.gi/gov_depts/environment/department_of_environment.htm

In line with this general trend in increasing environmental responsibility, the Gibraltar Government will establish itself as a leader in this respect. It simply makes good business sense. In doing so, Government will attempt to follow a simple framework that would undoubtedly result in numerous both short and long term benefits.

Benefits of a Green Business

The adoption of environmentally friendly techniques can first of all result in significant cost savings, savings that can be used for other tasks. The most common benefits derive from saving on resource and energy costs.

Improved public perception is yet another positive aspect. The public and businesses in general are increasingly becoming more environmentally aware. Government will subsequently benefit from the green business programme by demonstrating its commitment to the environment. Reviewing each department's impact on the environment will also help mitigate the impacts of future environmental legislation.

This is an issue that is ever-increasing in scope and severity. The number of departments affected will surely be minimal as compared to the private sector but nevertheless it is best to be aware of the issue.

There are many other advantages arising from the adoption of green business principles such as improved sales or preferred supplier status. However these are more relevant to the private sector where the competition factor is far more realistic.

Mission Statement

The aims of the Green Business Program are clearly summarized in the mission statement. Government departments will be encouraged to adopt and follow, as much as is reasonably possible, these broad principles and to take appropriate action.

The Government's mission statement is the following:

The Government of Gibraltar believes that it has a vital role in environmental leadership. Implementing effective management systems that minimize environmental impacts should consequently be incorporated into existing infrastructure arrangements so as to conform with Government's vision as a leader in Green Business. In order to fulfill this commitment, Government will aim to follow numerous principles that include:

- 1. Employing sustainable working practices in all daily tasks with regards to energy, materials and water consumption. Green procurement will also be considered where economically feasible.*
- 2. Complying with legislative and regulatory requirements and applying the best available techniques.*
- 3. Encouraging the adoption of the "Reduce, Re-use, Recycle" policy.*
- 4. Strive for continuous improvement on sustainability and promote environmental management systems.*

The over-riding objectives of this statement are to minimise the environmental impacts of activities undertaken by Government Departments and affiliated entities, thus indirectly reducing pollutant emissions, cutting down the amount of resources used and waste produced. In turn this will reduce unnecessary Government expenditure on energy and resources.

How will the Green Business Program work

It is the Government's intention that the backbone of the Green Business Program be based online in the form of a Green Business website. This website will not only

include a list of participating departments, it will also include extensive information from reliable sources on how to adopt greener practices.

It is envisaged that the website will also be used as an information sharing system whereby departments, and eventually the entire private sector, can share their experiences of the program and advise each other on debated topics. Such a scheme will be particularly useful for smaller entities that are not capable of financing environmental management professionals.

Once online, the website will be continuously updated incorporating features such as a discussion forum. After the initial implementation period, the Department of the Environment will carry out an informal audit process at each Department's request, addressing all issues pertaining to green business. Departments or private businesses that conform to the minimum requirements of an environmental management system will consequently be awarded green business certificates.

Certified entities can then be included in the list of participants eligible for the Annual Green Business of the Year Award. Further details of this award will be made public following the successful implementation of the Green Business Program.

Departments or private companies who embark on this program will lay the foundations for the implementation of internationally recognized environmental quality standards namely ISO14001, EMAS or the less stringent BS 8555. These standards typically apply to large businesses although their application is equally as applicable to small businesses. Environmental quality standards are typically based on a cycle of continuous improvement that involves reviewing practices, implementing programs and auditing. These core elements also form part of the Green Business program to be implemented locally.

Green Business Program – First steps

The most common question is always “what action do I need to take?” The initial objective is to produce an Environmental Policy Statement. This should be a brief document reviewing any impacts your organization might be having on the environment and your proposed actions to address the issues highlighted.

Environmental representatives play a key role in the development of the Green Business Program and they should be fully supported by higher-level staff. Representatives should ensure that best environmental practices are adhered to at all times. It is also in their interests to educate other members of staff on the significance of the actions proposed.

Energy Efficiency

Cutting down the amount of energy we use is one of those the principal objectives of any environmental plan. We all take energy for granted and as a consequence, over-consumption of energy has become embedded in our daily lives. There is no doubt

that this is having a detrimental impact on the environment. By way of an example, leaving a PC monitor switched on all night wastes enough energy to microwave six dinners. It is therefore not surprising that leading energy groups such as the Carbon Trust indicate that altering numerous practices in the office environment can actually decrease energy costs by 10% to 20%.

Managing energy use can be done in a number of ways.

Issues to consider

Environmental representatives should apprise themselves with how much energy departments are using. Keeping track of bills is vital in order to monitor energy usage and assess the cost-effectiveness of any energy saving measures introduced. It will also help to identify possible monthly/seasonal patterns in energy usage.

The envirowise website (www.envirowise.gov.uk) provides excellent links to guidelines on how to carry out simple energy audits. Examples include, switching off equipment such as computers, printers and photocopiers when not in use. Worthy of particular mention is the leaving of equipment on standby as this consumes unnecessary energy and wastes money.

Further examples of unnecessary energy use and ways of maximise such use include:

1. Lighting that is left on even when not needed. It makes economic sense to switch on fewer lights and make the most of natural light where it is available. Natural light is free and it won't damage the environment. To maximise the potential of natural light, it is advisable to keep windows clear and unobstructed.
2. It is useful to consider installing timers or sensors in areas that are hardly used so as to minimise unnecessary lighting. Submitting a list of all those areas where lighting is not needed to the office managers is something that provides a good starting point for environmental representatives.
3. As far as heating is concerned, following some basic common-sense tips will increase the efficiency of heat radiation. This includes leaving plenty of space around radiators, making sure windows and doors are completely closed and avoid turning up the heat excessively. Creating semi-tropical environments in the office isn't really recommended. The truth is that heating costs significantly increase each time the temperature is increased by one degree. Instead of relying solely on the heater for warmth, it's better to simply wear suitable clothes. Reviewing insulation in buildings is another useful option. Improving insulation will obviously be expensive but cost savings will surely be made in the long term. In the inverse, the same is also true for cooling down during warm weather.

Cutting down on energy costs by implementing the aforementioned techniques will help to cut down on carbon emissions.

Transport is also a major factor in Gibraltar in terms of emissions and therefore we should all be trying our best to promote the use of public transport, car sharing schemes and walking or cycling.

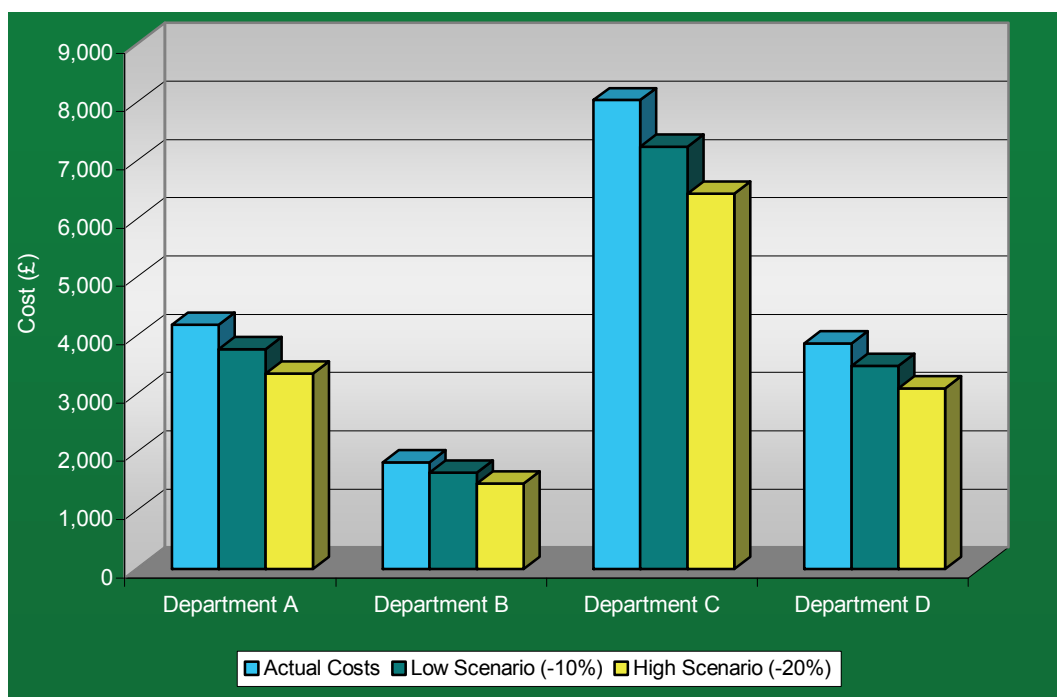
Water Efficiency

The issue of water efficiency is similar in nature. Again water bills should be monitored. Businesses will be surprised at how much water bills fluctuate and we should all be wanting to know why this is so. Advice on carrying out water audits is available from the links provided by Envirowise.

Water efficiency is perhaps more difficult to achieve since considerable savings tend to be made in relation to freshwater usage in washrooms, urinals, etcetera. We all know that Gibraltar uses a saltwater flush system so in our case, pumping costs can be avoided instead. This can be achieved by installing water-saving devices such as a dual flush system in bathrooms for example.

Other basic measures should be followed in order to cut down on water consumption, having in mind that production of potable water in Gibraltar is projected to increase by 3.48% by the year 2015. This equates to 4,850m³ per day. There are numerous things that we can all do to reduce water consumption. Taps for example should regularly be checked for drips. A dripping tap can waste up to 30 drops per minute, the equivalent to 4,600 litres per year, which is enough to fill a decent swimming pool, this amounts to a cost of £10 per tap per year. Whenever possible, consideration should be given to installing taps that minimise water use. Further information on this subject can be obtained from the Department of the Environment. Leaks should also be given particular attention and acted upon promptly since they are a major source of water wastage. Regular meter checks should aid detecting minor leaks that sometimes go unnoticed for prolonged periods. Equally, using just the right amount of water when boiling a kettle, has the dual effect of reducing the amount of water being used as well as the power consumption needed to unnecessarily heat more water than is required.

The graph illustrated below shows energy and water statistics for 2004/2005. It clearly shows the projected savings that can be achieved following the appraisal of water and energy saving techniques. A closer look shows that there are two possible scenarios reflecting maximum and minimum savings that can be achieved. In any case the point is clear – savings are possible.



Waste - Reduce/Reuse/Recycle

Waste minimization also forms part of the program. Excess waste production is often due to the inefficient use of resources and dealing with it has an impact on the environment. The production of waste needs to be addressed if both material resources and the environment are to be sustained. Businesses should therefore follow the philosophy of reducing, reusing and recycling materials otherwise known as the three **R**'s.

In Gibraltar, the average person disposes more than three quarters of a tonne of municipal waste per year. This is higher than the average amount disposed of by most developed European countries and shows that better practices need to be employed both at home and at work so as to minimise waste production.

Minimising waste production at work must be one of any business's ultimate goal. The use of paper for example can be minimized if both sides of paper is used when photocopying. Envelopes can be re-used for internal memos, or if possible, emails should be sent instead. Using the blank side of printed documents for draft material is yet another example of good practice along with the refilling or recycling of ink cartridges which is now a possibility locally.

Contrary to popular belief, the sorting component of recycling is already taking place in Gibraltar for certain types of waste. This includes batteries, oils, cardboard, metals and refrigerators. Cans and glass will also be recycled very soon. Environmental representatives should therefore make sure that these materials enter the appropriate waste stream and that they are not disposed of incorrectly.

Environmental Procurement

Green procurement has a significant role to play in any green business program and will consequently be followed as a matter of policy. Green procurement or green purchasing involves looking closely at the products that entities purchase in terms of how and where specific products are manufactured, what they are made of, their efficiency and whether they are actually needed in the running of any particular organization as well as their ultimate disposal. Green procurement guidance is available on the Internet from websites such as the UK Government website on sustainable development shown above. Further information will also be available from the new green business website to be set up locally.

There are a wide range of products that should be considered when making purchasing decisions in connection with the acquisition of items such as computers, domestic appliances, stationary, furniture and even company vehicles. For some of the products mentioned there are specific eco-labels or standards that should be considered. Computers for example should have the EPA energy star logo indicating reduced energy consumption. Domestic appliances on the other hand should have the EC Energy Label that identifies the energy efficiency of equipment on a scale of A to G. Other eco-labels include the Mobius Loop that shows whether a product is recyclable or is made of recycled material. The Forest Stewardship Council Logo is yet another useful label indicating that the paper in question has been made from sustainable forests. There are many other eco-labels verifying the environmental performance of products and it is in the best interests of us all to look out for these labels when making a purchase of any such item.

The foregoing is by way of an example of what is recommended should be considered as part of any green business program. There are many other issues that should, and will be tackled in the future as part of the Government's Green business programme such as, for example, the setting of performance targets on some of the key areas discussed. Further information can be obtained from the Department of the Environment.

Government of Gibraltar



Environment Charter Guiding Principles

For the Government and people of Gibraltar

1. To recognise that all people need a healthy living environment for their well-being and livelihood and that all can help to conserve and sustain it.
2. To use our natural resources sensibly, with regard to the needs of present and future generations.
3. To identify environmental opportunities, costs and risks in all policies and strategies.
4. To seek expert advice and consult with relevant parties on decisions affecting the environment.
5. To aim for solutions which benefit both the environment and development.
6. To contribute towards the protection and improvement of the global environment.
7. To safeguard and restore native species, habitats and landscape features, and control or eradicate invasive species.
8. To encourage activities and technologies that benefit the living environment.
9. To control pollution, with the polluter paying for prevention and remedies.
10. To study and celebrate our environmental heritage as a treasure to share with our children.

A blue ink signature of The Hon JJ Netto.

The Hon JJ Netto
Minister for the Environment

A blue ink signature of The Hon PR Caruana QC.

The Hon PR Caruana QC
Chief Minister

30th May 2006

Commitments

The Government of Gibraltar will:

1. Help build the capacity to support and implement an integrated environmental management system, which is consistent with Gibraltar's plans for sustainable development.
2. Involve different government departments, representatives of local industry and commerce, environment and heritage organisations, environmental campaigners and other community representatives to share their views on environmental issues in Gibraltar and take their opinions into consideration when formulating a detailed strategy for action.
3. Seek to ensure that all current and forthcoming environmental legislation is reviewed periodically and updated/transposed in a timely fashion.
4. Aim to ensure the protection and restoration of key habitats, species and landscape features through legislation and appropriate management structures and mechanisms, including a protected areas policy, and attempt the control and eradication of invasive species.
5. Where possible and reasonably practicable, ensure the extension of Multilateral Environmental Agreements to benefit Gibraltar's environment with due consideration to where and when Gibraltar has the reasonable capacity to implement such agreements.
6. Aim to ensure that environmental considerations are integrated with social and economic planning processes, promote sustainable patterns of production and consumption within Gibraltar through published government literature, advertising campaigns and school education programmes.
7. Upgrade and maintain the systems to ensure that Gibraltar has the legislation, institutional capacity (technology, equipment, procedures) and mechanisms it needs to meet international, community and local environmental obligations.
8. Commit to consultative decision-making on developments and plans that may affect the environment.
9. Promote better co-operation and the sharing of experience and expertise between Gibraltar and other countries that face similar environmental problems.
10. Implement effectively obligations under the Multilateral Environmental Agreements already extended to Gibraltar and work towards the extension of other relevant agreements.
11. Use local and international expertise to give advice and improve knowledge of technical and scientific issues. This includes consultation with interested non-governmental organisations and networks.
12. Review the range, quality and availability of baseline data for natural resources and biodiversity and where such data is unavailable, if possible, attempt to implement systems to cater for and allow the consistent generation of such data.
13. Commit local and EU/International funds to promote and implement projects of lasting benefit to Gibraltar's environment.
14. Ensure that legislation and policies reflect the principle that the polluter should pay for prevention or remedies; establish effective monitoring and enforcement mechanisms.

15. Help identify further funding partners for environmental projects, such as donors, the private sector or non-governmental organisations.
16. Encourage teaching within schools to promote value of our local living environment and to explain its role within the regional and global environment.
17. Recognise the diversity of socio-economic and environmental challenges facing Gibraltar and use these challenges to benefit the development and management of the living environment.
18. Promote publications that spread awareness of the special features of the environment in Gibraltar; promoting the guiding principles set out above.
19. Abide by the principles set out in the Rio Declaration on Environment and Development and work towards meeting Local, EU and International Development Targets on the environment.