Addressing Climate Change by Promoting Low Carbon Climate Resilient Development in the UK Overseas Territories

Needs Assessment:

South Georgia and South Sandwich Islands

Department for International Development

July 2012

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Content List

Background and Purpose

Introduction

This report forms one of a suite of 16 individual needs assessments of the UK Overseas Territories (UKOTs) produced as part of the process of developing a DFID/FCO led cross HMG programme design to address climate change by promoting low carbon climate resilient development in the UKOTs. The purpose of this assignment was to identify the scope and best way to deliver an appropriate climate change programme for all UK OTs and develop a business case for it (contract duration Feb – June 2012).

The purpose of the reports was to provide a rapid synthesis of information contained within available documentation and frame this in a way which: helped to establish a clear rationale for a generic framework forming one business case for the UK OTs but not allowing this to exclude targeted and selective action to meet specific needs. They were also designed to provide an evidence base for the later comparative analysis across OTs and subsequent prioritisation of different approaches for the business case, which was going to be designed later in the consultancy

It was agreed in May 2012 by the client and the consulting team that the contract was not fully deliverable as expressed in the original Terms of Reference. Details of the full programme of work and consultation is available in the project Inception Report (29th March 2012) and End of Contract Report (11th June 2012).

These reports now form a standalone output of the abbreviated consultancy.

The Reports

The original purpose of the reports still holds and the reader should recognise that the design and level of analysis in this report was set to be achievable within the time available (2 days of evidence gathering, research and writing against over 150 specific data points) and for the original purposes specified and no other. This report provides a general overview to facilitate future potential decision making and does not constitute a comprehensive nor in-depth analytical climate change report.

In a process facilitated by the UK Overseas Territories Association, data content in this report has been reviewed by in-country stakeholders via a nominated point of contact, with feedback incorporated if appropriate.

The report is tailored to the data points required to complete a climate change vulnerability matrix (VAM) tool. The VAM is structured around an understanding of four main issues: the exposure of an OT to climate change (threat analysis); adaptation and resilience; low carbon development and UK exposure. Each issue contains a number of subsets and indicators.

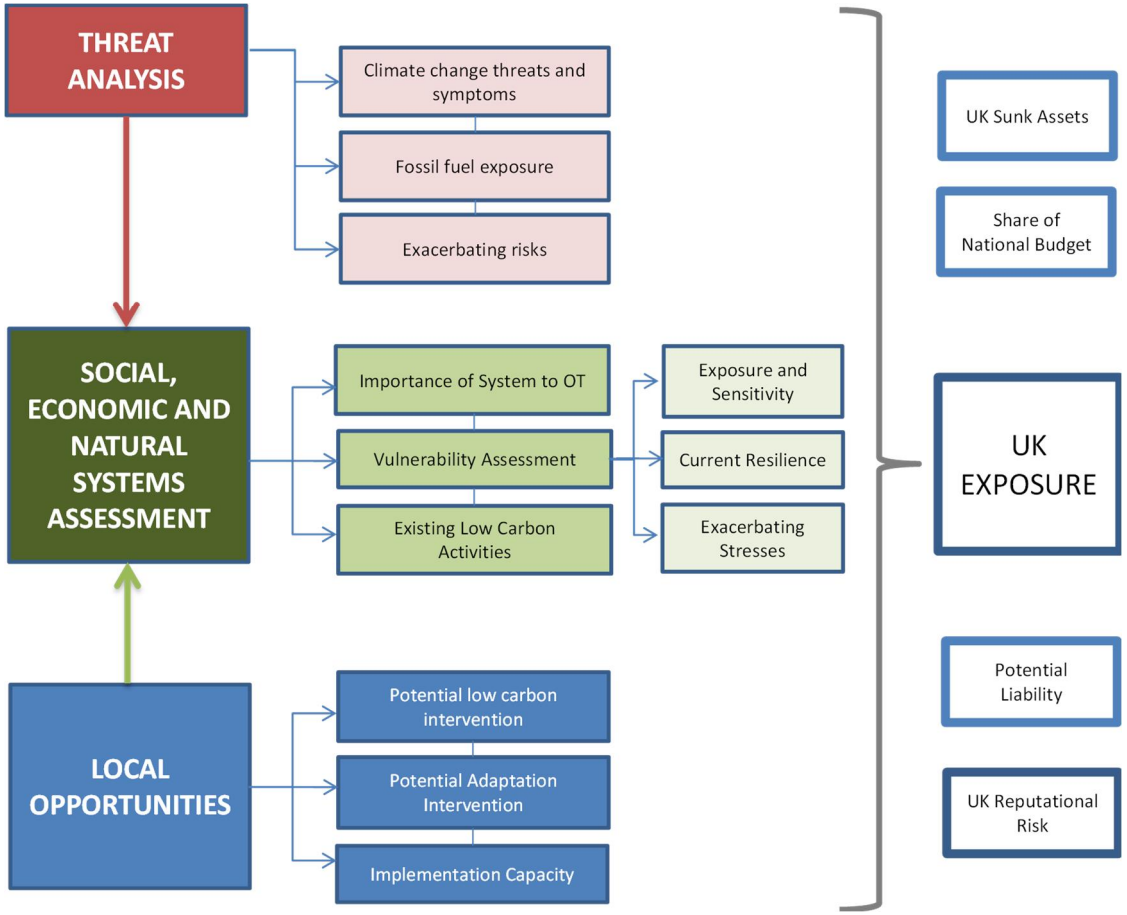
The completed VAM in this report uses a RAG colour coding system to provide a comparative analysis across all of the OTs to feed into the overall programme design. In most cases, data has been included specifically for the later appraisal and business case design process which would have followed.

Attached as annexes to this report are: an associated glossary of terms; a climate change VAM system definitions list; the VAM scoring system (which feeds into the coloured squares in the report text); the scored OT VAM; an initial programme approach table with preliminary sectoral and geographical analysis; and, if relevant, a greenhouse gas emission table.

Figure 1 overleaf illustrates how the data points in the VAM and in this report would have fed into the prioritisation process for a potential UKOT Climate Change Programme and DFID Business Case.

For a full understanding of how the data in this report and the VAM framework has been used, the reader is directed to the programme approaches which are elaborated in the programme Inception Report.

Figure 1: Prioritisation Process for the UKOT Climate Change Programme



Needs Assessment: South Georgia and South Sandwich Islands

KEY INDICATORS	
Population:	No permanent population[1]
GDP (£):	18-20 million (2006 est.)[2]
Per Capita GDP ($):	N.A.
ODA Entitled:	No
UK Annual Budget Support:	£813,000 (2005/06)[3]
Value of UK Sunk Assets:	N.A.
Key Economic Sectors:	Fishing, Tourism, Stamps

Threat Exposure Analysis

Climate Change Exposure

The South Georgia and South Sandwich Islands (SGSSI) are a series of islands in the South Atlantic. Mainland South Georgia is approximately 170kms long, with the South Sandwich Islands approximately 700kms south-east of South Georgia. South Georgia has a maritime climate with sea level temperatures averaging 0°C in winter and 7.5°C in summer and average precipitation rates of 1,500mm/year. South Georgia is largely barren and has steep, glacier-covered mountains due to its topography and location near the south of the polar front. The South Sandwich archipelago forms a rugged landscape with active volcanoes. Largely covered by permanent ice and snow with some sparse vegetation consisting of grass, moss, and lichen and subject to active volcanism, the South Sandwich Islands have prevailing weather conditions that generally make them difficult to approach by ship.[4]

The SG&SSIs one of the richest biological sites in the Southern Ocean and are of global significance as a pristine and rich environment that sustains major populations of seabirds and marine mammals: including globally threatened species. South Georgia waters are highly productive, supporting a large biomass of krill, on which many marine predators depend. The waters around South Georgia have also been identified as a globally important location for marine benthic biodiversity but that biodiversity is under threat from rapid regional warming. The islands wildlife is under threat from a rapidly changing environment in the face of climate change: illustrated by the accelerating retreat of coastal glaciers.[5] Further, rising sea temperatures have been suggested as the main cause of falling krill levels in the southern Atlantic and Southern Ocean: depending on

[1] However, there are two Government Officers and spouses, up to 25 British Antarctic Survey personnel at two research stations and up to 4 four museum staff in the summer months. http://www.sgisland.gs/index.php/%28h%29Frequently_Asked_Questions?useskin= accessed 12 April 2012
[2] NAO (2007), FCO Managing Risk in the Overseas Territories, Report by the Comptroller and Auditor General, HC 4 Session 2007 – 2008 16 November 2007, p.57
[3] It is stressed that this is a combined FCO contribution to the SGSSI and the Falklands in staffing and other costs. Disaggregated data is not known to exist.
[4] Petit, J. and Guillaume, P., 2008. *Climate Change and Biodiversity in the European Union Overseas Entities.* Gland, Switzerland: IUCN (International Union for Conservation of Nature) Publication Services, p.157
[5] GSGSSI (2011), New collaborators fund to develop scientific research on South Georgia, http://www.sgisland.gs/download/Small%20Grants%20advert.doc accessed 14 April 2012

krill for their food, declines of some bird species have also been reported (such as the gentoo penguin, macaroni penguin and black-browed albatross).[6]

Increased summer temperatures since the 1980s on the Islands could be attributed to climate change and it is suggested that it could result in the colonisation of non-native species.[7]

Resource Exposure

There is low real terms resource exposure due to no permanent population inhabiting the Islands. However, on the British Antarctic Survey (BAS) on Bird Island Research Centre, there is a diesel fuelled 20kW generator, with another in reserve for emergency. Generators are switched off at night to conserve fuel, and power is provided to essential services only by a battery bank that is charged during the day. Boilers provide heat throughout the day, and the hot water is circulated over night as it cools. Water is collected from the roofs and the local stream, and it is filtered and sterilised before use as potable water. Water and energy use are monitored closely and minimised where possible.[8] Grytviken and King Edward Point (KEP) have been powered by hydro-electricity since 2008.[9]

Adaptation and Resilience

Importance to OT

Importance of System to OT

Natural Systems: The territory is an important environment that sustains significant populations of marine mammals. South Georgian waters are an important location for Antarctic fur seals (*Arctocephalus gazella*) and there are also Orcas (*Orcinus orca),* and Sperm Whales *(Physeter macrocephalus)*.[10] *SGSSI* is also of international importance for its breeding seabird populations, with a high proportion of the world population of several species breeding on the islands: including macaroni penguin, grey-headed albatross, northern giant-petrel, and white-chinned petrel. Approximately 22 million pairs of Antarctic prions *Pachyptila desolata* and most of the world's population of the South Georgia subspecies of Imperial shag *Phalacrocorax artriceps georgianus* also inhabit the Islands. The SGSSI and surrounding waters are particularly important for albatrosses and petrels with colonies occurring at approximately 50 locations on both mainland South Georgia and offshore islands. South Georgia also supports the world's largest breeding population of grey-headed albatross with 47,674 pairs (representing around 55% of the world population) breeding during the 2003/04, and the second most important breeding populations of wandering (1,553 pairs) and black-browed albatross (74,296 pairs), and around a quarter of the world's population of light-mantled sooty albatross.[11] Only coastal fringes of South Georgia support vegetation, while the South Sandwich Islands sustain a significant maritime eco-system.

[6] J.P. McWilliams (2009), Implications of climate change for biodiversity in the UK Overseas Territories. JNCC Report, No. 427, p.45 http://jncc.defra.gov.uk/pdf/jncc427_web.pdf accessed 12 April 2012,

[7] J.P. McWilliams (2009), Implications of climate change for biodiversity in the UK Overseas Territories. JNCC Report, No. 427, p.45 http://jncc.defra.gov.uk/pdf/jncc427_web.pdf accessed 12 April 2012

[8] Found at www.antarctica.ac.uk/living_and_working/research_stations/bird_island/accessed 12 April 2012

[9] South Georgia Newsletter (2008). Green Power at Grytviken. Available at http://www.sgisland.gs/index.php/%28h%29South_Georgia_Newsletter%2C_December_2008. Accessed on 30 May 2012.

[10] Petit, J. and Guillaume, P., 2008. *Climate Change and Biodiversity in the European Union Overseas Entities.* Gland, Switzerland: IUCN (International Union for Conservation of Nature) Publication Services, p.158

[11] Varty et al (2008), FAO International Plan of Action-Seabirds: An assessment for fisheries operating in South Georgia and South Sandwich Islands, BirdLife International Global Seabird Programme http://www.sgisland.gs/download/South%20Georgia%20IPOA-Seabirds%20Assessment.pdf accessed 12 April 2012

There is one endemic landbird the South Georgia Pipit *Anthus antarcticus* and there are 19 other species of seabirds that have conservations statuses ranging from 'near threatened', 'endangered' to 'vulnerable'.[12]

Due to volcanic activity and harsh environmental conditions, the South Sandwich Islands, the vegetation of the Islands are limited, with a single species of vascular plant, the Antartic hair grasss (*Deschampsia antartica)* and a small number of mosses and lichens. As discussed, birds dominate the Islands, although the reindeer, Brown rats and house mouse too inhabit the Islands as well.[13]

Economic Systems: Limited economic activity. Although small tourism sector, human visitors to the Islands controlled. Tourism in SGSSI consists nearly always of visitors arriving in cruise ships or yachts, and visiting one or more coastal sites each day. Tourist numbers totalled over 5000 in 2011/2012.[14] The islands receive income from postage stamps produced in the UK, sale of fishing licenses, and harbour and landing fees from tourist vessels. In 2010, fishing licenses, touristic landing charges and the sale of stamps made up 75%, 16% and 4% of GSGSSI revenue respectively.[15]

Social Systems: Uninhabited excluding small number of government and scientific staff, as well as an occasional military presence.

Vulnerability

Sensitivity to Climate Exposure

The lack of permanent populations and the restrictions on tourism on the Islands, mean the main climate exposure occurs in the environmental sector. Home to 160 glaciers, of the 36 in South Georgia which have been studied, 28 are in retreat and have reached several kilometres in some glaciers. This has occurred since the 1980s and has coincided with a global increase in temperatures and a series of hot summers. This glacial retreat and increase in temperatures could result in the colonization of previously inaccessible areas. The reduction of seasonal sea ice in the region is suggested to be the likely cause of the decline in the crustacean Antarctic krill *(Euphausia superba)* population (between 38% - 75%): at the bottom of the food chain their decline could affect stocks of higher pelagic predators, marine mammals and seabirds.[16]

Since 1980s there has been an increase in seedling production by several naturalised exotic species that may be indicating that fertile seeds are being produced more often. These patterns are likely to be due to increased summer temperatures on the Islands: this factor itself potentially being a sign of climate change.[17]

Current Resilience Activities

Given the Islands are unpopulated many of the current resilience activities focus on the environment and environmental protection. Bird Island has been designated a Site of Special Scientific Interest under the Falkland Island Dependencies Conservation Ordinance 1975 and is designated a Specially Protected Area (SPA) within the latest South Georgia Environmental Management Plan. A marine protected area (MPA) was announced in early 2012, covering over one million square kilometres of the SGSSI's maritime zone making them one of the largest sustainably managed areas of ocean in the world. This provides protection for the sensitive biologically diverse seabed and supports the protection of the fish stocks around each of the islands within the Territory. The sustainable use MPA enshrines in legislation new and existing policies to ensure the highest standards of sustainable fisheries management. The declaration includes over 20,000 square

[12] Birdlife International (2006), Species Factsheets, www.birdlife.org accessed 12 April 2012
[13] Petit, J. and Guillaume, P., 2008. *Climate Change and Biodiversity in the European Union Overseas Entities.* Gland, Switzerland: IUCN (International Union for Conservation of Nature) Publication Services, p.157
[14] Figure from Personal Communication 30th May 2012
[15] GSGSSI (2011), Financial Statements for the year ended 31 December 2010.
[16] Petit, J. and Guillaume, P., 2008. *Climate Change and Biodiversity in the European Union Overseas Entities.* Gland, Switzerland: IUCN (International Union for Conservation of Nature) Publication Services, p.157
[17] J.P. McWilliams (2009), Implications of climate change for biodiversity in the UK Overseas Territories. JNCC Report, No. 427, p.61 http://jncc.defra.gov.uk/pdf/jncc427_web.pdf accessed 12 April 2012

kilometres of no-take zones, alongside a prohibition on commercial bottom trawling and depth limits on the use of commercial bottom longlining.[18]

The South Georgia toothfish fishery has already been certified as sustainable and well managed by the Marine Stewardship Council.[19]

A significant bank of research surveys (and related reports) on the bio-diversity regarding SGSSI exists.[20] BAS scientists are also undertaking a programme of scientific research at the new facility under contract to the Government of South Georgia and the South Sandwich Islands (GSGSSI), which is aimed at providing scientific advice to assist in the sustainable management of the valuable commercial fisheries around the island. There has been an applied fisheries research station at King Edward Point, South Georgia since 2001.

Through the Darwin Initiative the following projects have been funded:

- Developing knowledge to eradicate house mice from UK OT islands (Falklands Conservation)
- Mapping benthic biodiversity of the South Georgia continental shelf and slope (BAS)
- Automating seabird counts from standardised photos contributed by volunteers (Institute of Zoology)

To combat invasive species, in 2011, GSGSSI took the decision to eradicate reindeer from South Georgia and a rat eradication programme is underway, with another phase planned for 2013.[21] An agreement on the Conservation of Albatrosses and Petrels is in place. Several precautions are taken to prevent the introduction of rats at Bird Island and contingency plans are in place. Baited rat boxes situated throughout the island are regularly checked and all incoming cargo is inspected for rats upon arrival. In South Georgia, the SGH Habitat Restoration Project aimed at eradicating rodents is on-going. Phase 1, which cost £1.6 million, has recently been completed and has led to the eradication of rodents from areas around and adjacent to King Edward Point and Grytviken, from a rocky promontory on the western side of Mercer Bay and from the recently infested Saddle Island. Phase 2 will lead to the eradication of rodents from the whole South Georgia. A further £5 million is needed to complete the work.

Exacerbating Stresses

The main threats to biodiversity (excluding climate change) include introduced species.[22] Preying on both eggs and chicks, rats (*Ratus norvegicus)* around mainland South Georgia have devastated populations of burrowing birds; they are currently not present on Bird Island and could have a severe impact on local wildlife there.

As a result of the knock-on effect of the exclusion of vessels using heavy grade fuel oil from the Antarctic, more of these types of vessels may use South Georgian waters, meaning there is an increased risk of oil spills: which would be devastating for the pristine environment.[23]

Future Opportunities

Potential Adaptation Interventions

The GSGSSI has indicated its intention to undertake further scientific work during 2012 to identify whether additional protection measures should be incorporated into the MPA designation in the future. BAS research

[18] FCO (undated), South Georgia and South Sandwich Islands announce Marine Protected Area to safeguard biodiversity, www.fco.gov.uk/en/news/latest-news/?id=735683482&view=News accessed 26 July 2012

[19] Written Ministerial Statement (2012), South Georgia & South Sandwich Islands Marine Protected Area, www.parliament.uk/documents/commons-vote-office/February_2012/28-02-12/8.DFID-South-Georgia-and-South-Sandwich-Islands.pdf

[20] Found at www.sgisland.gs/index.php/Main_Page accessed 14 April 2012

[21] Found at www.sgisland.gs/index.php/Main_Page accessed 14 April 2012

[22] Petit, J. and Guillaume, P., 2008. *Climate Change and Biodiversity in the European Union Overseas Entities.* Gland, Switzerland: IUCN (International Union for Conservation of Nature) Publication Services, p.158

[23] GSGII (2011), IAATO presentation, www.sgisland.gs/download/GSGSSI%20presentation%20to%20IAATO%202011.pdf accessed 15 April 2012.

on Bird Island is being undertaken with the aim to establish a conservation policy and management to maintain the current diversity of the southern oceans.[24]

Also funded by the International Year of Biodiversity, studies will be undertaken to determine the extent of marine alien invasion at key points around South Georgia.[25]

In order to stimulate new research on South Georgia and to develop new scientific collaborations, the GSGSSI is offering a number of small grants to work at the research station at KEP. Grants are not available for work at Bird Island. Two small grants (to a maximum of £25,000) are offered for the 2012/13 or 2013/14 seasons to enable researchers to undertake scientific work on South Georgia.

Implementation Capacity

There is no UK Governor but the GSGSSI is active. The GSGSSI commissions a detailed management report every few years, which measures the biodiversity on and around the Island. It also makes recommendations for future policy, and reports on the effectiveness that previous measures have had. [26]

South Georgia also has two modern research stations. The base at Bird Island is operated by the BAS and undertakes ecological and demographic research on the population of penguins, seals and albatross that are abundant on the island. The base at King Edward Point (KEP) is run by BAS on behalf of the GSGSSI and the FCO and undertakes fisheries and ecological research.

British Antarctic Survey research station on Bird Island – intermittently from 1957 to 1982 and permanent since then – has the potential to house up to 10 staff and two short term staff.

The BAS scientific research at Bird Island focuses on seabird and seal population dynamics, feeding ecology and reproductive performance. Zoological assistants collect long term datasets to detect trends in population numbers, mating partners, breeding success, diet quality and quantity, and seasonal feeding grounds with the aim of developing our understanding of the southern ocean ecosystem. Much of this data is provided to Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) Ecosystem Monitoring Programme. Annual reports include: the Bird and Mammal Report, Beach Litter Study, and Seal Disentanglements Reports. Other various scientific studies are being conducted on bird counting surveys for the Government of South Georgia within the Agreement on the Conservation of Albatrosses and Petrels (ACAP).

The South Georgia Heritage Trust (SGHT) staff the Museum at Grytviken from October to March each year and is active in the South Georgia stakeholder's meeting held annually with GSGSSI. SGHT also funds an annual internship at the South Georgia Museum and has partly funded a series of specific projects; including the rat eradication project (in conjunction with GSGSSI).

Low Carbon Development (Source)

Current Emissions

Share of Current Emissions

SGSSI are not covered by the UK GHG Inventory.

[24] Written Ministerial Statement (2012), South Georgia & South Sandwich Islands Marine Protected Area, http://www.parliament.uk/documents/commons-vote-office/February_2012/28-02-12/8.DFID-South-Georgia-and-South-Sandwich-Islands.pdf accessed 12 April 2012

[25] DEFRA (2012), The Environment in the United Kingdom's Overseas Territories, accessed 21 March 2012, p.15

[26] South Georgia and South Sandwich Islands (2012). Introduction. Available at: http://www.sgisland.gs/index.php/(e)introduction. Accessed on 30th May 2012.

GHG Abatement

Abatement Potential

GSGSSI have recently replaced most of oil fired boilers at KEP with an electric one, nonetheless a small amount of fossil fuel is still burned.

Current Abatement Activities

Following work undertaken in 2008, South Georgia is nearly self-sufficient through hydro energy.

Future Opportunities

Potential LCD Intervention

As abatement potential section above.

Implementation Capacity

See section above on adaptation implementation capacity.

UK Exposure

UK Sunk Assets

Unknown.

Absolute Value of UK Transfer

Unknown.

Share of National Budget from UK Transfer

The SGSSI derive most of its income from the sale of fishing licenses for Patagonian toothfish, mackerel icefish and krill. While varying considerably from year to year, in the year ending 2005, license fees totaled just over £2.5 million.[27]

However, some HMG expenditure (including staff and admin costs in the UK and the territories), in 2005-06 this totalled £813,000. It should be noted that this is a total aggregated figure from the FCO, which includes Falkland Islands costs.[28]

Potential Liability

The UK has various international obligations to protect the precious environment through various environmental treaties. The recently declared MPA underpins the sustainable management and environmental stewardship of SGSSI, as well as contributing to the UK's wider commitment to the conservation of the Southern Ocean, through its leading role within the Commission for the Conservation of Antarctic Marine

[27] GSGSSI (2006), South Georgia: Plan for Progress, http://www.sgisland.gs/download/PlanProgress/G2.1_South_Georgia_intro.pdf accessed 14 April 2012

[28] NAO (2007), FCO Managing Risk in the Overseas Territories, Report by the Comptroller and Auditor General, HC 4 Session 2007 – 2008 16 November 2007, p.30

Living Resources.[29] Given the scope and scale of the MPA, there are significant potential liabilities should it not be enforced.

Further, SGSSI are a signatory of the following agreements:

- The Agreement on the Conservation of Albatross and Petrels
- Convention on the Conservation of Migratory Species of Wild Animals (CMS);
- The Convention on the Prevention of Marine Pollution by the Dumping of Wastes and Other Matter: The London Convention/The London Protocol;
- Ramsar Convention on Wetlands of International Importance;
- Vienna Convention for the Protection of the Ozone Layer; and,
- Montreal Protocol on Substances that Deplete the Ozone Layer

Providing a framework for the development of environmental policies, the South Georgia Environment Charter was developed in conjunction with the UK Foreign and Commonwealth Office and the UK Overseas Territories Conservation Forum and was signed by HMG and SGSSSI in September 2001 and provides a framework for the development of environmental policies.

Reputational Risks

HMG has stated that the 'UK has long-term strategic, scientific, environmental and sustainable resource management interests in SGSSI'.[30] Given the SGSSI are internationally recognised for their biological importance and pristine condition, the successful environmental protection of SGSSI is key to UK interests in the territory.

As with the Falkland Islands, SGSSI continue to be claimed by Argentina. South Georgia has a number of derelict whaling stations, which in the 1990s were identified as containing asbestos and other pollutants. Work has already been undertaken in Grytviken, costing £5 million but a further £25 - 30 million worth of work remains to be undertaken to make the areas safe. Currently this risk is contained as tourists are not allowed in the area but it remains an on-going contingent liability.[31]

[29] Written Ministerial Statement (2012), South Georgia & South Sandwich Islands Marine Protected Area, http://www.parliament.uk/documents/commons-vote-office/February_2012/28-02-12/8.DFID-South-Georgia-and-South-Sandwich-Islands.pdf accessed 12 April 2012

[30] FCO (2010), United Kingdom Government Strategy: South Georgia & the South Sandwich Islands: 2010-2015, www.fco.gov.uk accessed 12 April 2012

[31] NAO (2007), FCO Managing Risk in the Overseas Territories, Report by the Comptroller and Auditor General, HC 4 Session 2007 – 2008 16 November 2007, p.57; modified following personal communications.

Annex One: UKOT Climate Change Vulnerability Analysis Matrix Glossary of Terms

UKOT Climate Change Vulnerability Analysis Matrix Glossary of Terms

Abatement Potential	(Cost effective) technical potential for reducing emissions within sector.
Absolute GHG Emissions	Annual amount of greenhouse gases (GHG) produced by an Overseas Territory. It is measured as metric tonnes of CO_2 generated per year.
Absolute Value of UK Transfer	Total amount of funding from UK to an Overseas Territory per year.
Adaptation	The extent to which existing initiatives and measures (projects and programmes) are expected to reduce the vulnerability of natural and human systems against actual or expected climate change effects.
Adaptive Capacity	The ability of a social or natural system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.
Carbon sink	A natural or artificial reservoir that accumulates and stores some carbon-containing chemical compound for an indefinite period. Natural: Absorption of carbon dioxide by the oceans via physicochemical and biological processes and photosynthesis by terrestrial plants. Artificial: include landfill and carbon capture and storage.
Climate Change	A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.
Climate Change Impact	Consequences of climate change on social, economic and natural systems without considering adaptation.
Climate Change Exposure	The change in climate with a potential adverse effect on social, economic and natural systems.
Current Abatement Activities	Any action that reduces the emissions or emissions intensity (per unit output) of a given sector on-going or completed in UK Overseas Territories as of March 2012.
Current Resilience Activities	Resilience activities on-going or completed in UK Overseas Territories as of March 2012.
Energy Efficiency	Ratio of energy output of a conversion process or of a system to its energy input: measures taken to reduce demand for energy for the same projected level of development.
Energy Import Dependence	Percentage of energy imported from abroad by the single Overseas Territory.
Exacerbating Stresses	Natural or human factors which in isolation or combination have the potential to lead to a change in the severity or frequency of a climate change threat. This may include inter alia a natural hazard, an extreme weather event, social tension or conflict, demographic trends and population characteristics and institutional and/or societal capacity constraints.
Exposure	The sum of the character, magnitude and rate of climate change variation to which a system is influenced by.
Fossil Fuel Dependence	The percentage of total fuel consumption derived from carbon-based fuels from fossil carbon deposits (including coal, oil, and natural gas) and the percentage of that fuel that is imported.
Frequency and Severity	Occurrence and magnitude of an event in UK Overseas Territories.
Future Opportunities	A territory's ability to reduce greenhouse gas emissions or to enhance carbon sink (Potential LCD Intervention) coupled with its potential to plan adjustment interventions in response to the effects of climate change (Potential Adaptation Intervention).
GHG Abatement (Current)	Potential for reducing emissions within sector coupled with any action already in place that reduces the emissions or emissions intensity of a given sector.

Implementation Capacity	Current (March 2012) capacity to design, implement and monitor all related low carbon / adaptive capacity activities. This includes all current resource constraints (i.e. funding, local personnel capacity, lack of personnel, supportive infrastructure etc.) and opportunities.
Importance of system to OT	The value that society and people in an UK Overseas Territory place on the significance of impacts and vulnerabilities (see Vulnerability) on social, economic and natural systems.
Low Carbon Development (Source)	Actions which include making a contribution towards stabilising levels of CO_2 and other greenhouse gases at a level that will avoid dangerous climate change, through cuts in emissions, demonstrate a high level of energy efficiency, use low-carbon energy sources and/or utilise and enhance carbon sinks.
Magnitude	The area or number of people likely to be affected as a proportion of total population or land area.
Potential Liability	Legal, Financial, Moral and Political exposure arising from the activities of the UK Overseas Territories. This includes UK commitments to legal treaties that extend to the OTs (e.g European Convention on Human Rights) and response to natural and man-made disasters and terrorist events.
Potential LCD Intervention	A territory's ability to reduce anthropogenic CO_2 and other greenhouse gas emissions or to enhance carbon sinks, where ability refers to skills, competencies, fitness and proficiencies that a territory has attained and depends on technology, institutions, wealth, equity, infrastructure and information.
Potential Adaptation Interventions	The potential for a planned intervention which constitutes or contributes to an adjustment in natural, social or economic systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.
Reputational Risk	Reputation is defined as the social evaluation of the public towards HMG. Risk is the probability that a failure to act will produce harm to that reputation. This reputation may be defined in terms of the potential: loss of HMG ethical (moral) reputation for safe guardianship of its citizens) disruption or distortion of HMG relationship with its citizens in the OTs withdrawal of private sector investment in UK Overseas Territories (investor flight).
Resilience	The ability of a social or natural system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.
Resource Exposure	Degree at which a system is influenced by a variation in the availability or the price of resources (specifically water and energy).
Resource Use Efficiency	The effective use of energy and water resources – limiting wastage and maximising usable resources.
Sensitivity to Climate Exposure	Affects the magnitude and/or rate of a climate related perturbation or stress and is the degree to which a system [exposure unit] is affected, either adversely or beneficially, by climate variability or climate change. The effect may be direct (e.g. a change in crop yield in response to a change in the mean, range, or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to sea level rise).
Share of Current Emissions	Percentage of OT's Absolute GHG Emissions generated by each sector.
Share of National Budget from UK Transfer	Percentage and amount (at 2011 prices) of the total Overseas Territory Budget which comes from HMG budgetary support.
System (Social, Economic and Natural)	A set of functionally inter-related elements subdivided into Natural (ecosystems and bio-diversity) and Social and Economic (Human) elements.
Threat Exposure Analysis	Identification of the threats that may affect a system and evaluation of their frequency and severity.
UK Exposure	Risk to the UK arising from activities in the UK Overseas Territories. It includes UK Sunk Assets, Share of National Budget from UK Transfer, Potential Liability and Reputational Risk.

UK Sunk Assets	UK investments in physical infrastructure in the Overseas Territories which cannot be recovered.
Vulnerability	The degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity.

Key:

Voice reported in VAM

Additional voice

Annex Two: UKOT Climate Change VAM Systems Definition

SOCIAL, ECONOMIC AND NATURAL SYSTEMS DEFINITIONS	
Biodiversity and Ecosystems (Marine and terrestrial)	Ecosystems – A community of living (plants and animals) and non-living things (climate, landscape) which interact together and affect each other. Biodiversity – The variety of plant and animal life found in an ecosystem and the variation in their genetic makeup. It is a measure of the health of an ecosystem, with healthy ecosystems having greater variety and variation in plant and animal life than unhealthy ones. *Source: Brown, 2008*[i]
Hydrology and Water resources	Hydrology - The various systems that are involved in the hydrological cycle (water evaporation, atmospheric circulation of water vapour, cloud formation, precipitation, interception by plant life, land surface runoff, soil infiltrations, groundwater recharge, discharge into streams etc). Water resources – The availability of useful water, often a limiting factor for social and economic development. Sources include groundwater, rainwater and surface reservoirs or rivers. *Source: Gray, 2010*[ii]*; Parry et al., 2007*[iii]
Tourism	Comprises the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purpose *Source: UNWTO, 2011*[iv]
Transportation	A system of conveying people, goods, etc., from one place to another. The definition includes water, air, and land transport.
Agriculture and Fisheries	Agriculture- The science or practise of cultivating the soil and rearing animals Fisheries – The occupation of catching or rearing fish
Forestry	All economic activities that mostly depend on the production of goods and services from forests including commercial activities that are dependent on the production of wood fibre. It also includes activities such as the commercial production and processing of non-wood forest products and the subsistence use of forest products *Source: FAO, 2004*[v]
Energy Supply and Use	Energy supply - Extraction, conversion, and transportation of fuels and electricity to ultimate end use Energy use - The amount of fuels and electricity utilized during a period of time to provide a useful service such as heating, cooling, or transportation *Source: Wilbanks et al., 2008*[vi]
Industry and Commerce	Industry - Industry includes manufacturing, mining, construction and related informal production activities. Other categories, such as transport, energy supply & demand and processing of forest products have been included in other sectors. Commerce – Commerce is the exchange or buying and selling of commodities. In our definition it includes trade, retail and other commercial activities.
Human Health	Human health includes physical, social and psychological well-being. Society – Society includes *infrastructures*, *human settlements* and *social issues*. *Infrastructures* are systems designed to meet relatively general human needs, often through largely or entirely public utility-type institutions. Infrastructures for settlements and society include both 'physical' (sanitation and communication systems) and 'institutional' (shelter, health care, food supply, security and fire services and other forms of emergency protection). *Human settlements* comprise physical capital (buildings) where most of the world's population live. *Social issues* include all the factors relating to human society and its members, concerning the way of life of the local population (livelihoods and welfare). *Source: Parry et al., 2007*

HDI/ Livelihoods/ Poverty	HDI (Human Development Index) - A summary composite index that measures a country's average achievements in three basic aspects of human development: longevity, knowledge, and a decent standard of living. Livelihoods - A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. Poverty – A state or condition in which a person or community lacks the financial resources and essentials to enjoy a minimum standard of life and well-being that is considered acceptable in society. *Source: Chambers and Conway, 1991*[vii]

Note: The sectors considered as potential sources of greenhouse gases in the Low Carbon Development section are the ones reported by Department of Energy and Climate Change, 2009[viii].

[i] Brown, N., 2008. *Climate Change in Overseas Territories: An Overview of the Science, Policy and You,* Peterborough, UK: Joint Nature Conservation Committee

[ii] Gray, G. A. L., 2010. *Montserrat National Climate Change Issue Paper,* Montserrat: Ministry of Agriculture, Land, Housing and the Environment

[iii] Parry, M., Canziani, O. & Palutikof, J. P., 2007. *Climate Change 2007: Impacts, adaptation and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernment Panel on Climate Change,* Cambridge, UK: Cambridge University Press.

[iv] UNWTO, 2011. *World Tourism Organisation UNWTO.* [Online] Available at: http://statistics.unwto.org/en. [Accessed 12 03 2012].

[v] FAO, 2004: Trends and Current Status of the Contribution of the Forestry Sector to National Economies, Rome: FAO, available on http://www.fao.org/docrep/007/ad493e/ad493e05.htm

[vi] Wilbanks T. J. et al., 2008. *Effects of Climate Change on Energy Production and Use in the United States*, Washington, US: US Climate Change Science Programme

[vii] Chambers, R., & Conway, G. (1991). *Sustainable Rural Livelihoods: Practical Concepts for the 21st Century.* Online] Available at: http://www.smallstock.info/reference/IDS/dp296.pdf [Accessed 28 03 2012].

[viii] Department of Energy and Climate Change, 2009. *5NC - The UK's Fifth National Communication under the United Nations Framework Convention On Climate Change.* London

Annex Three: UKOT Scoring Matrix

ANNEX III: RAG SCORING FOR UKOT VAM

#		Red	Red/Amber	Amber/Green	Green
Threats Exposure Analysis					
	Exposure: Frequency and Severity of climate effects	Current: High Impact 2050: Impact + Confidence	Current: Medium Impact 2050: Impact + Confidence	Current: Low Impact 2050: Impact + Confidence	Current: No impact 2050: No impact
Resource Exposure					
	Exposure: Fossil Fuel and Energy Import Dependence, Resource Use Efficiency and GHG Emission	High Dependency, Emissions and Low Resource Use Efficiency	Medium Dependency, Emissions and low Resource Use Efficiency	Low dependency, emissions and medium resource use efficiency	Low (or No) dependency, emissions, and high resource use efficiency
Importance to Overseas Territory					
1	Importance of System to OT *Natural Systems*	Bio-diversity characterised by high levels of endemic / endangered species and / or territory with internationally recognised environmental designation[1] Critical levels of water stress	Bio-diversity characterised by presence of endemic / endangered species and internationally recognised environmental designation Moderate levels of water stress	Bio-diversity characterised by low levels of endemic / endangered species and no internationally recognised environmental designation Limited levels of water stress	Bio-diversity characterised by very low levels of endemic / endangered species and no internationally recognised environmental designation No water stress
	Economic Systems	Dominant contribution to OT GDP (>20%)	Significant contribution to OT GDP (5%-20%)	Limited contribution (<5%) to OT GDP	No contribution (0%) to OT GDP

[1] As identified by IUCN redbook.

#		Red	Red/Amber	Amber/Green	Green
	Social Systems	Per capita GDP (<$6000) Low life expectancy / High infant mortality rates	Per capita GDP ($6001 - $20000) Medium life expectancy / Medium infant mortality rates	Per capita GDP ($20001 - $50000) Medium life expectancy / Low infant mortality rates	Per capita GDP ($50000 +) High life expectancy / Low infant mortality rates
Vulnerability (Current)					
2.1	Sensitivity to Climate Exposure	High sensitivity to climate change exposure/high potential for irreversible impacts	Medium sensitivity to climate change exposure/medium potential for irreversible impacts	Low sensitivity to climate change exposure/low potential for irreversible impacts	No sensitivity to climate change exposure/no potential for irreversible impacts
2.2	Current Resilience Activities	No resilience planning and/or very limited adaptive capacity	Weak resilience planning and/or adaptive capacity	Moderately effective resilience planning and/or adaptive capacity	Strong resilience planning and/or adaptive capacity
2.3	Exacerbating Stresses	Significant exacerbating stresses	Moderate exacerbating stresses	Limited exacerbating stresses	No exacerbating stresses
Future Opportunities					
3.1	Potential Adaptation Interventions	No technical/programmatic opportunities available.	Limited technical/ programmatic opportunities available, and significant work/investment required to develop bankable projects or programmes	Technical/programmatic opportunities exist, but only as pilot projects/strategies and require further investment to develop bankable projects or programmes	Technical/programmatic opportunities exist and bankable investments/projects are available for immediate funding
3.2	Implementation Capacity	No technical, political and financial capacity to	Limited technical, political and/or financial capacity to	Moderate technical, political and/or financial capacity to implement and	Strong technical, political and financial capacity to implement

#		Red	Red/Amber	Amber/Green	Green
		implement and monitor adaptation activities, with full UK input required.	implement and monitor adaptation activities, with significant UK input required.	monitor adaptation activities, with moderate UK input required.	and monitor adaptation activities, with limited UK input required
Current Emissions					
4.1	Share of Current Emissions	High (>30%)	Medium (15%-30%)	Low (5%-15%)	None/Marginal <5%.
GHG Abatement					
5.1	Abatement Potential	No abatement potential <10%	Limited abatement potential identified 10%-25%	Moderate abatement potential identified 25%-50%	Significant abatement potential identified E.g. >50% of current levels
5.2	Current Abatement Activities	No low carbon development planning or investment	Weak low carbon development planning and investment	Moderately effective low carbon development planning and investment	Strong evidence of effective low carbon development planning and investment
Future Opportunities					
6.1	Potential LCD Intervention	No technical/programmatic opportunities available.	Limited technical/ programmatic opportunities available, and significant work/investment required to develop bankable projects or programmes.	Technical/programmatic opportunities exist, but only as pilot projects/strategies and require further investment to develop bankable projects or programmes.	Technical/programmatic opportunities exist and bankable investments/ projects are available for immediate funding.
6.2	Implementation Capacity	No technical, political and financial capacity to implement and monitor low carbon activities, with full UK input required.	Limited technical, political and/or financial capacity to implement and monitor low carbon activities, with significant UK input required.	Moderate technical, political and/or financial capacity to implement and monitor low carbon activities, with moderate UK input required.	Strong technical, political and financial capacity to implement and monitor low carbon activities, with limited UK input required.

UK Exposure (2012)					
7.1	UK Sunk Assets	>£100m	£20-£100m	£5-£20m	£0-£5m
7.2	Absolute Value of UK Transfer	£500,001 - £1,000,000	£250,001 - £500,000	£100,001 - £250,000	>£100,000
7.3	Share of National Budget from UK Transfer	75%> of national budget for specific system from UK transfer	51% to 75% of national budget for specific system from UK transfer	26% to 50% of national budget for specific system from UK transfer	25%< of national budget for specific system from UK transfer
7.4	Potential Liability	Cost of honouring and implementing legal treaties and other HMG commitments (>£200m)	Cost of honouring and implementing legal treaties and other HMG commitments (>£50m)	Cost of honouring and implementing legal treaties and other HMG commitments (>£10m)	Cost of honouring and implementing legal treaties and other HMG commitments (<£10m)
7.5	Reputational Risks	Irreparable reputational risk in terms of loss of: HMG reputation for safeguarding citizens / climate change and ecosystems; HMG disruption to the relationship with its citizens; and potential to severely disrupt private sector investment in the UKOTs related to specific system.	Serious but not irreparable reputational risk in regards to loss of HMG safeguarding reputation, HMG relationship with citizens or private sector investment related to specific system.	Limited reputational risk in regards to loss of HMG safeguarding reputation, HMG relationship with citizens or private sector investment related to specific system.	No reputational risk in regards to loss of HMG safeguarding reputation, HMG relationship with citizens or private sector investment related to specific system.

Annex Four: South Georgia and South Sandwich Islands - Scored VAM

RED
RED/AMBER
GREEN/AMBER
GREEN

Threat Exposure Analysis	Frequency and Severity	
	Current	2050
Climate Change Exposure		
1 Increase in temperature		
2 Increase/decrease/variability in precipitation	X	X
3 Decrease in snow cover and ice		
4 Heat waves		
5 Heavy precipitation events/floods		
6 Extreme storm events	X	X
7 Rising sea levels		
8 Ocean acidification		

Resource Exposure	Current
1 Fossil Fuel Dependence	
2 Energy Import Dependence	
3 Resource use efficiency	
4 Absolute GHG emissions	X

Low Carbon Electricity Resource Potential	Share of Current Electricity Production	Potential
1 Wind	X	X
2 Hydro	High	High
3 Solar PV	X	X
4 Geothermal	X	X
5 Biomass	X	X
6 Waste (solid, liquid)	X	X
Low Carbon Heat Potential	% of buildings	Potential
1 Solar Thermal	X	X
2 Biomass	X	X
Liquid Fuels	% of consump	Potential
1 Bioethanol	X	X
2 Bio diesel	X	X

South Georgia and South Sandwich Islands

Summary

The South Georgia and South Sandwich Islands (SGSSI) are a series of islands in South Atlantic. South Georgia is largely barren and has steep, glacier-covered mountains; and the South Sandwich Islands are of volcanic origin with some active volcanoes. Largely covered by permanent ice and snow with some sparse vegetation consisting of grass, moss, and lichen and subject to active volcanism, the South Sandwich Islands have prevailing weather conditions that generally make them difficult to approach by ship. The South Georgia and South Sandwich Islands are 'one of the richest biological sites in the Southern Ocean'

Threat Exposure Analysis
As a pristine environment that sustains significant numbers of threatened species and the largest protected marine environment of the earth, there is significant potential for climate change exposure. However, no permanent population reside on the Islands, so limited need for fossil fuel / dependency. Nonetheless the Territory has been powered by hydroelectricity since 2008.

Adaptation and Resilience
Although the potential for serious vulnerability issues and shocks, significant resilience and adaptation activities, potential, legislation and capacity.

Low Carbon Development
SGSSI are not on the UK GHG registry and with limited personnel living on the Territory there has been limited need for largescale low carbon development. However, South Georgia virtually self-sufficient regarding energy resourcing through hydropower.

UK Exposure
Although limited transfers from HMG the UK has long-term strategic, scientific, environmental and sustainable resource management interests in SGSSI and could face significant future liabilities.

Exacerbating Risks
Introduction of invasive species; Risk of oil spills

Additional Potential Classification

High	High levels of cost effective technical potential identified, with strong evidence of associated planning and investment
Medium	Medium cost effective resource potential identified, with medium evidence of associated planning and investment
Low	Limited cost effective technical potential identified, with limited evidence of associated planning and investment
None	No cost effective technical potential identified.

Adaptation and Resilience	Importance to OT	Vulnerablity (Current)			Future Opportunities	
	Importance of System to OT	Sensitivity to Climate Exposure	Current Resilience Activities	Exacerbating Stresses	Potential Adaptation Interventions	Implementation Capacity
Natural						
Biodiversity and Ecosystems						
Hydrology and Water resources						
Economic						
Tourism						
Agriculture and Fisheries						
Energy Supply and Use						
Industry and Commerce*						

UK Exposure (2012)				
UK Sunk Assets	Absolute Value of UK Transfer	Share of National Budget from UK Transfer	Potential Liability	Reputational Risks
X	X	X		
X	X	X		
X	X	X		
X	X	X		
X	X	X		
X	X	X		

Low Carbon Development (Source)	Current Emissions	GHG Abatement (Current)		Future Opportunities	
	Share of Current Emissions	Abatement Potential	Current Abatement Activities	Potential LCD Intervention	Implementation Capacity
Energy Supply	X	X			
Public*	X	X			
Waste management	X	X	X	X	X

* Including research facilities and activities

Annex Five: UKOT Potential Programme Approaches – Preliminary Sectoral and Geographical Analysis

	Programme Approach	Sectoral and OT Relevance		Activities	
		Sectors	OTs	Current	Potential
1	Adaptation: Needs Focus	Energy Supply and Use	Gibraltar	Replacement of power plants with a power station powered by diesel engines.	n/a
2	Adaptation: Effectiveness Focus	Biodiversity and Ecosystems	Bermuda	Bermuda Biodiversity Action Plan - Activity report 2010; The Bermuda Plan 2008	Stringent water conservation practices; environmentally-sound desalination operations; better weather forecasting; coastal zone management plan (building on Draft Planning Statement (2008))
			Gibraltar	Management and Action Plan for the conservation of Sites of Community Importance enforced; Marine Special Area of Conservation designated; Catalogue of living resources; Habitat and Species Action Plans.	Dolphin study; climate change studies.
3	Mitigation: Needs Focus	Energy Supply	Bermuda	Electricity for the entire Island is produced at BELCO's Pembroke location.	Public land/seabed allocated for utility-scale renewable electricity generation projects; generation licences for power producers and comprehensive interconnection standards; quality standards specifically for distributed renewable energy systems included in building codes; expedited planning processes for small-scale renewable generation; efficiency standards; energy auditing.
			Gibraltar	Replacement of power plants with a power station powered by diesel engines.	The use of biofuels to be encouraged by selling at lower price in petrol stations; adopt biofuels for Govt fleet.
		Transport	Gibraltar	New bus transport system introduced; free to children.	Reduction in the energy used for road transport (9% target for 2016); Car park and park and ride bus shuttle service construction planned; Increase in public transport times/routes; More free public transport.
4	Mitigation: Emissions Reduction Potential Focus	Energy Supply	Gibraltar	New power station has the capability to run on biofuels.	Adoption of renewable energy resources: wind, energy from waste and tidal current all considered technically viable.
			Montserrat	2008 Montserrat Sustainable Development Plan; shortly be upgrading its diesel based power station to more reliable 1.5 MW source	Exploitation of geothermal energy is a stated aim of the National Energy Policy; test drilling 2012; Geothermal energy is proved to be feasible, there is potential to generate up to 50MW of energy, with export of around 40MW to a neighbouring island; potential wind turbine sites at locations within the Blakes Estate although the new National Physical Development Plan for North Montserrat 2012-2022 zones this land for residential and recreational tourism;
		Transport	Gibraltar	Use of private vehicles discouraged	Car park and park and ride bus shuttle service constructed; increase in public transport times/routes; more free public transport.
		Business	Montserrat	New port development at Carr's Bay	Development of new town at Little Bay creates potential for incorporation of passive design principles; GoM Infrastructure Plan includes suite of potential low cost measures: energy efficient fans, water pumps, cooking appliances and behavioural change.
		Land Use, Land Use Change and Forestry	Montserrat	2008 Montserrat Sustainable Development Plan; New National Physical Development Plan for North Montserrat	National Physical Development Plan for North Montserrat 2012-2022
5	Mitigation: Effectiveness Focus	Business	BVI	National Tourism Policy & Development Master Plan; strengthening Building Regulations; Climate Change risk management protocols, Disaster Relief Fund, micro insurance schemes and mutual/cooperative insurance schemes, financing options for renewable energy installations.	Climate Change Trust Fund - funds would meet costs associated with diversifying tourism product; sub-regional/domestic emissions trading scheme that will ensure benefits are flowing from the UK and European carbon trading scheme; Carbon Levy on guests of hotels and charter yachts; Climate Change Financial Risk Management Levy on foreign registered companies and ships
		Residential	BVI	A National Physical Development Plan, Local Area Plans	Medium/long term implementation A National Physical Development Plan, Local Area Plans
		Waste Management	BVI	Energy & water conservation/efficiency standards;	n/a
		Land Use, Land Use Change and Forestry	BVI	National Tourism Policy & Development Master Plan; expanded protected areas; building & disaster management criteria; National Physical Development Plan; Local Area Plans	Medium/long term implementation A National Physical Development Plan, Local Area Plans

6	Standardised Policy Focus	Relevant to all sectors	Relevant to all OTs	Possibilities are: FCO sponsored pilot on environmental mainstreaming; Scaling up of FCO approach to	Mainstream climate change into existing policies and plans
7	Capacity Building Focus	Relevant to all sectors	Relevant to all OTs	Possibilities are: BAT: provision fo staff education under the Carbon Reduction Strategy. DFID support via	Prioritise interventions in the draft climate change policy and develop programme of capacity support to take forward
8	Next Step Approach	Relevant to all sectors	Relevant to all OTs	Possibilities are: Falklands: scale up wind farm technologies; Gibraltar: renewable energy legislation.DFID support via the ECACC programme and	Prioritise interventions in the draft climate change policy and develop programme of capacity support to take forward
9	UK Exposure Approach	Biodiversity and Ecosystems	Anguilla	Designation of one nationally protected (wetland) area and allocation of 7.5acre demonstration area for Department of Environment; draft climate change policy drafted and to be adopted in 2012;	Conserve existing wetland (saltpond) ecosystems and encourage wetland migration strategies; approve and implement a National Wetlands Policy; continuous monitoring and development of comprehensive bio-diversity baseline; development of an integrated coastal zone management plan which includes understanding the risk of flooding due to sea level rise and improvements to the national coastal monitoring system and system of beach profile data collection ; implement schemes for re-vegetation and re-nourishing beaches
			BAT	26 Specially Protected Areas and Marine Protected Area designated; Penguin distribution study; Wildlife awareness manual; Toolkit for the management of Protected Areas; Identification of important bird areas; Polar Science for Planet Earth project	Proactive management of key Protected Areas; Continuation of the penguin distribution study
			Falklands	Bio-diversity strategy in place. FIG sponsored environmental research, awareness raising, conservetion and management activities. OTEP projects to conserve or collect species or restore plant habitats.	Species monitoring and species action plans in place.
			Montserrat	Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention); Vienna Convention for the Protection of the Ozone Layer;	protected areas/zoning; in situ conservation of endemic species and control of invasive species; revise port legislation re discharge; ensure protection of ghauts and vegetative strips and enforce all aspects of land use planning
			Gibraltar	Management and Action Plan for the conservation of Sites of Community Importance enforced; Marine Special Area of Conservation designated; Catalogue of living resources; Habitat and Species Action Plans.	Dolphin study; climate change studies
			SBAs	Special protection Areas designated; Turtle projects; Acacia Control Project	Designation of Special Areas of Conservation; MoU for Conservation of Migratory Birds of Prey in Africa and Eurasia
		Hydrology and Water Resources	Anguilla	New desalination water plant	Water harvesting, increased water storage and more effective maintenance of distribution network to reduce leaks; promote the use of water savings devices (low flush toilets etc); develop and implement national outreach and educational programmes; bring efficiencies to water desalination as technology improves and bring renewable energy sources on stream (wind and solar).
			BAT	Introduction of more efficient reverse osmosis plants; Introduction of water saving flow reduction valves	Implementation of a programme of water efficiency technology changes
			Falklands	n/a	Climate change modelling based on collected data.
			Gibraltar	Modernisation of fresh water distribution (saving of energy during desalinisation; seawater used for conveyance of sewage and other non-domestic purposes; Replacement of sea defences	Flood defences; Improvement of drainage infrastructure.
			Montserrat	Some adhoc water harvesting, (minidams, roof rainwater harvesting). Many assets not maintained and now in disrepair.	Protect groundwater sources from pollution; develop better water resource management and allocation systems; Opportunity for all new build at Little Bay and Carr's Bay.
			SBAs	n/a	Adoption of Concentrating Solar Power technologies for water desalination

		Tourism	BAT	n/a	Enhancement of UK expertise on tourism management
			Montserrat	Potential investments in the new town at Little Bay and the construction of a new port, if affected, would not reflect well in the international press.	Fiscal incentives to encourage sustainable tourism; integrate mainstream CC issues (impact, responses, opportunities) into tourism development strategy; recommended design speeds increased for new tourism-related structures; enhanced reef monitoring systems to provide early warning alerts of bleaching events, and; artificial reefs or fish-aggregating devices
			Gibraltar	n/a	n/a
		Transportation	SBAs	n/a	n/a
			Montserrat	Potential investments in the new town at Little Bay and the construction of a new port, if affected, would not reflect well in the international press.	Integrate CC issues into current port design and the master plan development at Little Bay and other infrastructural development projects.
			Gibraltar	New bus transport system introduced; free to children.	Car park and park and ride bus shuttle service construction planned; Increase in public transport times/routes; More free public transport.
		Energy Supply and Use	Anguilla	n/a	Enhance efficiency of diesel power generation. Link into regional sources of energy arising from potential geothermal networks on Nevis and Montserrat. Customer educational policies to encourage energy efficiency; promote energy efficient technologies such as energy efficient light fittings and solar hot water heaters.
			BAT	Solar heating systems installed at 2 stations; Introduction of sub-metering more effective monitoing of energy consumption; Introduction of LCD screens	Adoption of renewable enrgy sources: wind turbine and solar photovoltaic systems; Energy efficient rettrofits for research ships; use of unmanned aerial vehicles
			Montserrat	2008 Montserrat Sustainable Development Plan; shortly be upgrading its diesel based power station to more reliable 1.5 MW source.	Exploitation of geothermal energy is a stated aim of the National Energy Policy; test drilling 2012; Geothermal energy is proved to be feasible, there is potential to generate up to 50MW of energy, with export of around 40MW to a neighbouring island; potential wind turbine sites at locations within the Blakes Estate although the new National Physical Development Plan for North Montserrat 2012-2022 zones this land for residential and recreational tourism.
			Gibraltar	Replacement of power plants with a power station powered by diesel engines.	The use of biofuels to be encouraged by selling at lower price in petrol stations; adopt biofuels for Govt fleet; Adoption of renewable energy resources: wind, energy from waste and tidal current all considered technically viable.
		Industry and Commerce	BAT	All infrastructures constructed with best practices in low energy design.	n/a
			Montserrat	Potential investments in the new town at Little Bay and the construction of a new port, if affected, would not reflect well in the international press.	n/a
			Gibraltar	n/a	Incentives for import and use of highly efficient equipment.
		Livelihoods/Poverty	Anguilla	n/a	n/a
			Montserrat	Invested heavily in irrigation infrastructure, training of farmers, livestock production units and a farmer's resource centre.	Government is investing in improved fisheries infrastructure and training to improve the quantity, quality and presentation of produce.
			Falklands	n/a	n/a
			Gibraltar	n/a	n/a
		Human Health	Anguilla	n/a	n/a
			Montserrat	n/a	Public education and outreach; forecasting systems for Dengue Fever and other vector-borne diseases.
			Falklands	n/a	n/a
			Gibraltar	n/a	n/a
10	Do Nothing Approach	n/a	n/a	n/a	n/a