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

Needs Assessment: The Falkland Islands

Department for International Development

July 2012

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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.

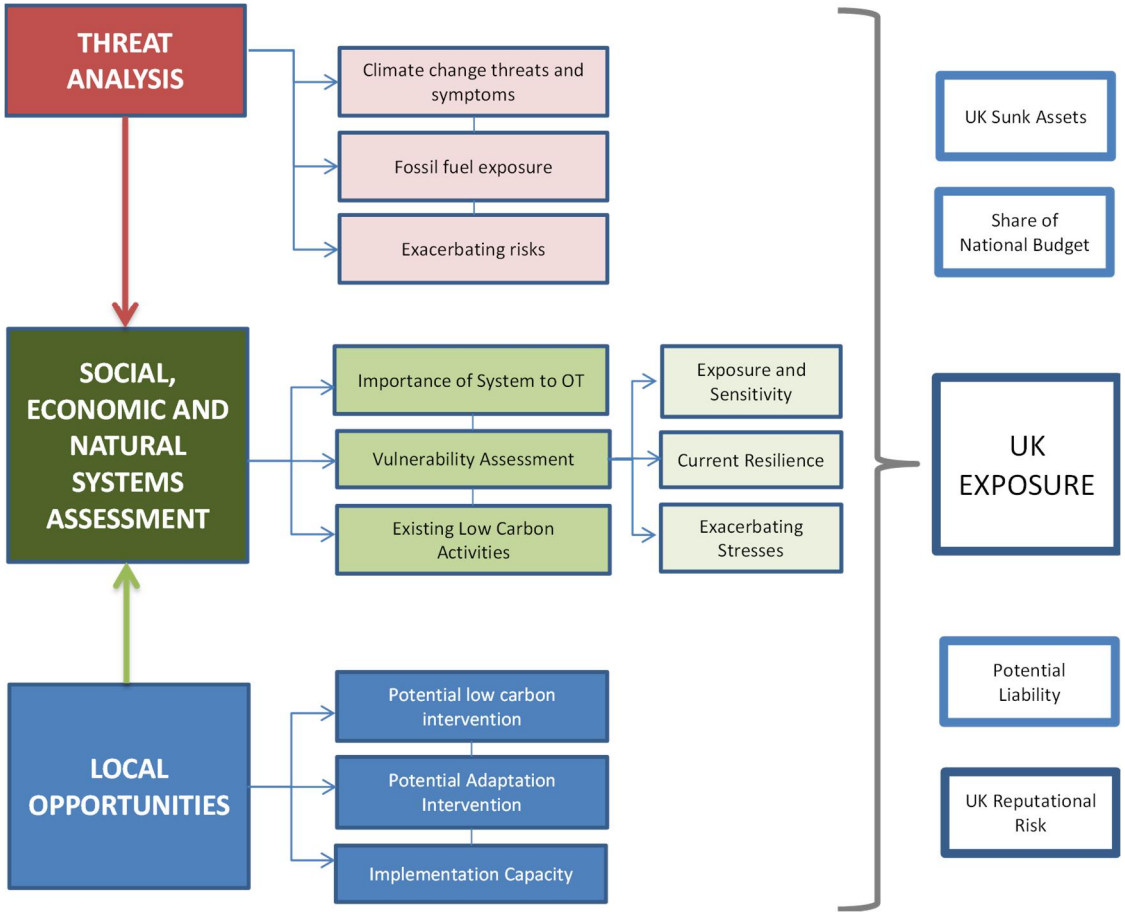
The completed VAM in this report uses a RAG colour coding system to provide a comparative analysis across all of the OTs to feed into the overall programme design. In most cases, data has been included specifically for the later appraisal and business case design process which would have followed.

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: The Falkland Islands

KEY INDICATORS	
Population:	2,478 (2006)[1]
GDP:	£104m (2007)[2]
Per Capita GDP:	£34,944 (2007)[3]
ODA Entitled:	No
UK Annual Budget Support:	£0 – excluding defence.
Value of UK Sunk Assets:	N.A.
Key Economic Sectors:	Fishery, Agriculture, Tourism

Threat Exposure Analysis

Climate Change Exposure

The Falkland Islands have a cool temperate oceanic climate, dominated by westerly winds and low annual rainfall.[4] Meteorological data suggests that over the last 50 years the Falkland Islands have experienced a drying and warming trend,[5] with evidence that rainfall is slowly declining[6]and periods experienced when ozone depletion is particularly strong. Sea levels in the region have risen over the last 150 year period between 0.7 to 1.3 mm/year.[7]

Although there has only been limited analysis of land or oceanographic climate data to develop predictive models, it has been suggested that this is likely to change. Over the long term, Antarctic ice melt may result in cooler water and air temperatures and increased cloud cover and rainfall over the Falklands.[8]

Resource Exposure

Previously dependent on diesel generators for power, in 2007 the Falkland Islands Government spent £2.3million on Phase 1 activities of the Sandy Bay Wind Farm which it expected to displace 20% (788,322 litres) of the Stanley Stations annual fuel consumption. Actual results have shown a 26% diesel displacement (1,011,682 litres per annum), savings of £10,000 a week and £10,000 more from electricity sales in addition to reducing dependency on imported oil and a reduction in carbon emissions.[9]) 40% of Stanley's energy is now provided by wind power.[10] Phase 2 of activities began in February 2010, with total (Phase 1 & 2) costs being £4.6 million.

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[1] Based on 2006 census figures from FCO (undated), Falkland Islands Country Profile, www.fco.gov.uk/en/travel-and-living-abroad/travel-advice-by-country/country-profile/south-america/falkland-islands/?profile=all accessed 21 March 2012.
[2] *Ibid.*
[3] *Ibid.*
[4] Falklands Conservation (2008), Falkland Islands State of the Environment Report 2008, p.8
[5] Falklands Conservation (2008), Op Citp.23
[6] Hoppe and McAdam (1998), Is the Falklands climate really changing, Wool Press N° 109:7-10
[7] Falklands Conservation (2008), *Op Cit*p.26
[8] Falklands Conservation (2008), *Op Cit*p.26
[9] FIG (2008), *Op Cit*.
[10] FCO (undated), *Op Cit*

Exploratory drilling for oil was undertaken in 1998 and continued between 2010-2012.[11] In 2011 Rockhopper Exploration confirmed the presence of commercially viable reserves and expect to begin extraction in 2012[12]

The Falklands generated 59,000 metric tonnes of CO_2 in 2008[13] and 46,000 metric tonnes in 2009 from the consumption of energy.[14] The most significant source of CO_2 is domestic heating.[15]

Adaptation and Resilience

Importance to OT

Importance of System to OT

Natural Systems: The Falklands are characterised by significant levels of bio-diversity across the nineteen land habitat types on the islands and its coastal waters.[16] This includes 43 threatened species[17] and internationally important populations of breeding seabird and penguin populations: the Falklands are home to two endemic bird species and 14 sub-species (twenty-two Important Bird Areas identified), the world's largest concentration of black browed albatross (70% of global population), 36% of the global population of southern rockhopper penguins and 34% of the world's gentoo penguins.[18] Among the marine mammals, Elephant Seal, Sea Lion and Fur Seal all breed on the Islands.[19] Seventeen Important Plant Areas have also been identified. The islands are home to 13 endemic plant species[20] and all 23 plant species listed in the Falklands Red List are protected by legislation. Zebra trout are also fully protected by Falkland Islands legislation, with a species action plan prepared in 2008.

Key climatic impacts relate to the potential spread of invasive species and potential impact of rising sea levels on beaches, which are the likely to be the 'most vulnerable habitat utilised by bird species in the Falkland Islands.'[21]

Economic Systems: The three main economic sectors are fisheries, agriculture and tourism. Fisheries represent the dominant sector with significant annual income from fishing licenses since the FIG enforced a 200 mile fishing exclusion zone in the mid-1980s.[22] In 2008/2009 62,000 cruise ship passengers visited the Falklands. However, tourism levels have recently been affected by the introduction of a ban on heavy grade fuel oils in the Antarctic region and the global financial crisis. Land-based tourism is increasing annually with greater economic benefits.

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[11] FCO (undated), Falkland Islands Country Profile, www.fco.gov.uk/en/travel-and-living-abroad/travel-advice-by-country/country-profile/south-america/falkland-islands/?profile=all accessed 21 March 2012.

[12] Rockhopper Exploration (2011): "14/10-4 Appraisal well update" available online from http://www.rockhopperexploration.co.uk/pdf/14-10_4_%20well_result_FINAL.pdf accessed 19 07 2012

[13] United Nations Statistic Division, 2012.Millennium Development Goals. [Online] Available at http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crid= Accessed 22 March 2012.

[14] Data found at www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=90&pid=44&aid=8&cid=FK,&syid=2005&eyid=2009&unit=MMTCD

[15] DEFRA (2011), National Inventory Report CO, Annexes: Emissions from Fossil Fuel Combustion, http://uk-air.defra.gov.uk/reports/cat07/1104281001_ukghgi-90-09_Annexes_issue2.pdf accessed 25 March 2012

[16] Falklands Conservation (2008), Falkland Islands State of the Environment Report 2008

[17] These comprise 17 cetaceans, 2 fish and 24 bird species respectively. Borders & Southern Petroleum Plc (2010), Environmental Impact Statement Offshore Falkland Islands Exploration Drilling, available at www.epd.gov.fk/wp-content/uploads/B&S%20Falklands%20EIS.pdf, accessed21 March 2012.

[18] A. Baylis (2012), *2010 Archipelago-Wide Census gentoo and Rockhopper Penguins*, Falklands Conservation, Stanley

[19] FIG (undated) www.falklands.gov.fk/Environment.html

[20] These are: *Chevreulialycopodiodes, Erigeron incertus, Gamochaetaantarctica, Hamadryasargentea, Leucheriasuaveolens, Nassauviagaudichaudii, Nassauviaserpens, Nastanthusfalklandicus, Phlebolobiummaclovianum, Plantagomoorei, Seneciolittoralis and Seneciovaginatus and Calceolaria fothergillii.* Found in McAdam and Broughton (2011), The current status of and threats to, the vascular flora of the Falkland Islands, South Atlantic available at www.scielo.cl/scielo.php?pid=S0718-686X2011000100009&script=sci_arttextaccessed 21 March 2012

[21] 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 20 March 2012.

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

In the 2009/10 financial year, the government revenue was £42.4 million of which £14.5 million came from fishery licences and services and £10.5 million from taxes. During this period the government expenditure was £47.6 million. Based on 2010 forecast figures, sectoral contributors to GDP include: fisheries 52.5%; government (including health and education) 14.0%; communications, finance and business services 11.4%; hospitality and transport 7.7%; construction 6.6%; housing and other services 3.2%; mining, quarrying and manufacturing 2.1%; agriculture 1.6% and utilities 0.9%.[23]

The oil sector is in its infancy, with exploration drilling in 1998 and 2010-2012.

Social Systems: Per capita GDP on the Falklands is high at £34,944 (2007).[24]

Sensitivity to Climate Exposure

The impact of climate change on the islands biota and natural systems are potentially significant. Rising sea levels may affect bird nesting grounds, while warming is expected to impact on extensive kelp beds, which support wider ecosystems of invertebrates, molluscs and fishes, which in turn provide food for birds.[25] The potential combination of falling rainfall and periods of strong ozone depletion could have a significant impact on flora.[26]

Although potential effects on soil arthropod communities is reported to be small and initially slow to develop,[27] invertebrate bio-diversity is cited as threatened by climate change (and alien introductions).[28]

Since the 1990s there has been a long term trend in reduction in catch levels in the fishing industry contributed to by climatic conditions and ocean currents, which has seen total revenues halve.[29]

Current Resilience Activities

Resilience activities in the Falklands to date have been conservation led and largely focused on natural systems.

Since 2004, OTEP has supported ten projects in the Falklands (some linked to other OTs), all of which have addressed the conservation of individual species or collections of species or the restoration of plant habitats. These include:

1. 2004-2006 Albatross and Petrel Conservation Programme;
2. 2005-2006 Falkland Islands Key Sites Project;
3. 2007-2008 Falkland Islands Plants Conservation Project;
4. 2004-2010 Falkland Islands Shallow Marine Programme;
5. 2009-2011 Falkland Islands native Plants Programme;
6. 2009-2011 Cobb's Wren Conservation Project and 2009-2011 Ocean Climate and Rockhopper Foraging Strategies;
7. 2010-2012 Action Plan for the Conservation of Falkland Islands Rockhopper Penguins in partnership with the Environmental Planning Department of the Falkland Islands Government;
8. 2011 Rat Eradication Programme in partnership with FIG and to support bird nesting;[30]
9. 2011-2014 Falkland Islands Protected Areas Strategy is in partnership with Falklands Conservation and will help identify key biodiversity areas and build a comprehensive network of protected areas.

[23] FIG (2010), Economic Briefing & Forecast for the Falkland Islands
[24] *Ibid.*
[25] J.P. McWilliams (2009), *Op Cit*.
[26] McAdam and Broughton (2011), The current status of and threats to, the Vascular Flora of the Falkland Islands, South Atlantic, *Anales Instituto Patagonia* (Chile), 2011. 39(1):103-108
[27] Bokhorst*et* al (2008), Climate change effects on soil arthropod communities from the Falkland Islands and the Maritime Antarctic, available at www.sciencedirect.com/science/article/pii/S0038071708000576 accessed 21 March 2012
[28] Falklands Conservation (2008), *Op Cit*, p.9
[29] NAO (2007), *Op Cit*, p.49
[30] J.P. McWilliams (2009),*Op Cit*, p.45

There are currently more introduced (such as thistles and ragworts) than native plant species on the Islands. DEFRA Funds have been used to determine the extent of marine invasive alien species at key points around Falklands and to eradicate and control high priority invasive alien species, including plants and rodents.[31]

FIG provides approximately £40,000 annually for environmental research, awareness-raising, and conservation and management activities. The FIG's current five year plan includes planned species monitoring over the next four year period (2011 – 2015). [32]

Exacerbating Stresses

Although being addressed to some degree (see above), the threat of non-native species continues to threaten the bio-diversity of the Falklands.

The recent scaling up of tension's regarding the Falklands has seen the Government of Argentina report that it will prosecute companies associated with Falkland Islands oil exploration. This is in addition to recent Argentine efforts to disrupt trade, sea and air links to the Islands.[33]

Future Opportunities

Potential Adaptation Interventions

Potential adaptation interventions are focused on natural systems.

The Falkland Islands Biodiversity Strategy 2008 – 2018 outlines key action points to counter bio-diversity losses and has a specific action plan for climate change research, and the designation of key land, terrestrial and marine biodiversity sites.[34]

Implementation Capacity

FIG has an Environmental Planning Department and a Memorandum of Understanding with Falklands Conservation in support of the Biodiversity Strategy. There is also the recently established South Atlantic Environmental Research Institute based in the Falklands.

The FCO has three UK staff (as of 2007) dedicated to the Falklands.

Low Carbon Development (Source)

Current Emissions

Share of Current Emissions

The Falkland Islands fall under the UK ratification of the Kyoto Protocol but are not required to reduce their emissions or place a ceiling on emissions in the 2008 – 2012 commitment period.

The Falklands generated 59,000 metric tonnes CO_2 in 2008[35]and 46,000 in 2009 from the consumption of energy.[36] Further, peatland drainage can result in significant emission of CO_2 and nitrous oxide. The Falklands

[31] DEFRA (2012), The Environment in the United Kingdom's Overseas Territories, accessed 21 March 2012
[32] FIG (2010), The Islands Plan 2010/15
[33] FIG (2012), Response to the Argentine Government's intent to prosecute companies associated with Falkland Islands oil exploration, www.falklands.gov.fk/news/2012/03/ accessed 27 March 2012
[34] FIG (2008), The Falkland Islands Biodiversity Strategy 2008 – 2018 , found at www.epd.gov.fk/wp-content/uploads/BiodiversityStrategy09.pdf accessed 23 March 2012
[35] United Nations Statistic Division, 2012.Millennium Development Goals. http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crid= Accessed 22 March 2012.
[36] Data found at www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=90&pid=44&aid=8&cid=FK,&syid=2005&eyid=2009&unit=MMTCD

have 11,408 sq. km of peatland, with peatland forming 93.7% of total land area. These peatland assets comprise a carbon stock of 1,151 Mton CO_2 and have a potential 3771 Mtons $CO_2$of possible future emissions.[37]

GHG Abatement

Abatement Potential

At a macro scale, the mitigation of climate effects is beyond the ability of Falkland Islands to implement, and the only means is through international protocols such as Kyoto.[38]

However, there are local opportunities possible with the scaling up of wind farm activities. The Falklands have experimented with other forms of renewable energy (hydro-electric and solar power) but they don't currently match the performance or cost effectiveness of wind power. The FIG is currently examining the potential of energy storage and heat pump technologies to optimise the potential for wind power and further reduce the consumption of fossils fuels.[39] Wind farm management also reviewing fixed wind power output with electric car storage.[40]

Current Abatement Activities

Under the Wind Farm Project, FIG has installed a wind farm and undertaken infrastructure developments to the power station (details above). Further abatement activities include a heat recovery system linked to the diesel power station and subsidies towards the cost of domestic wind turbines for the farming community.

Future Opportunities

Potential LCD Intervention

Wind energy represents the shape of identified potential low carbon interventions. The Islands are in the furious fifties, with a mean wind speed at Stanley of 16 knots.[41] 40% of Stanley's energy is provided by wind power (discussed in detail above). Also FIG Camp Energy Policy (the installation of wind turbines on farm settlements) has resulted in over 50% of farm energy requirements being produced by wind power.[42]

Implementation Capacity

FIG has an Environmental Planning Department. FIG has a Memorandum of Understanding with Falklands Conservation in support of the Biodiversity Strategy. There is also the recently established South Atlantic Environmental Research Institute based in the Falklands.

The FCO has three UK staff (as of 2007) dedicated to the Falklands.

[37] Wetlands International (2009), The Global Peatland CO_2 Picture Peatland Status and Drainage Related Emissions in all Countries of the World (Produced for the UN=FCCC meeting in Barcelona, November 2009)
[38] Falklands Conservation (2008), *Op Cit*, p.29
[39] Reported at www.falklands.gov.fk/Renewable_Energy.html accessed 26 March 2012
[40]Reported at www.businessgreen.com/bg/feature/2042919/falkland-islands-delivered-worlds-wind-powered-smart-grid accessed 26 March 2012
[41] Falklands Conservation (2008), *Op Cit,* p.22
[42] Falklands Conservation (2008), *Op Cit*, p.30

UK Exposure

UK Sunk Assets

There is a British military base in East Falkland comprising air, sea and land assets: 2,000 personnel live at the Mount Pleasant Air Base.

Absolute Value of UK Transfer

The FIG has been financially self-sufficient (excluding defence) since 1998. Excluding defence, there has been no HMG transfer to the Falklands Islands since 1998, although there is some annual HMG (FCO) expenditure (including staff and admin costs in the UK and the Territories): in 2005-06 this totalled £813,000.[43]

Share of National Budget from UK Transfer

As above.

Potential Liability

The following major conventions apply in the Falkland Islands: European Convention on Human Rights; International Covenant on Economic and Social Rights; International Covenant on Civil and Political Rights; UN Convention against Torture; UN Convention on the Rights of the Child; UN Convention on the Elimination of Racial Discrimination; and UN Convention on the Elimination of all Forms of Discrimination Against Women. Further, the Falkland Islands is a signatory of the following agreements and relevant domestic laws:

- Conservation of Wildlife and Nature Ordinance 1999;
- The Agreement on the Conservation of Albatross and Petrels
- Convention on International Trade in Endangered Species of Wild Flora and Fauna
- Convention on the Conservation of Migratory Species of Wild Animals (CMS);
- Ramsar Convention on Wetlands of International Importance; and
- The Kyoto Protocol

UK, through 1997 Ottawa Conventions on Landmines, HMG is responsible for clearing the 15,000 – 20,000 mines that remain on the Islands since the 1982 conflict.

The Environmental Charter was signed in 2001, stating mutual responsibilities of the UK and its OTs.

Significantly, FIG has built up significant reserves to meet future liabilities (totalling £170 million by 2006) and has no debt.[44]

Reputational Risks

The Falkland Islands are strategically and historically important to the UK. However, the tensions with Argentina over island sovereignty remain an on-going issue.

[43] This figure includes FCO costs for SS&SGI. No disaggregated data available.
[44] NAO (2007), *Op Cit*, p.49

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 Opportunties					
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: The Falkland Islands - Scored VAM

RED
RED/AMBER
GREEN/AMBER
GREEN

Falkland Islands

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

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

Low Carbon Electricity Resource Potential	Share of Current Electricity Production	Potential
1 Wind	Medium	High
2 Hydro	X	Low
3 Solar PV	X	Low
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 consumption**	**Potential**
1 Bioethanol	X	X
2 Bio diesel	X	X

Summary

The Falkland Islands are an archipelago of approximately 780 islands and islets in the South Atlantic Ocean, the largest of which are East Falklands and West Falklands. They have a cool temperate climate. Excluding defence, the Falkland Islands are economically self-sufficient from the UK.

Threat Exposure Analysis

Issue of the spread of invasive species and potential impact of rising sea levels on beaches and marine food chain. Previously dependent on diesel generators for power. Since 2007 the Falkland Islands Government (FIG) has spent £4.6 million on wind farm activities resulting in a 26% displacement of diesel (1,011,682 litres). FIG has undertaken a series of infrastructure improvements to upgrade power, water, sewage and waste disposal services in Stanley.

Adaptation and Resilience

Significant bio-diversity levels: 43 threatened species and 13 endemic plant species present. Three main economic sectors: fisheries, agriculture and tourism. Oil sector in its infancy, with exploration drilling in 1998 and 2010-12. Falkland Islanders relatively prosperous. Based on meteorological data, there has been a drying and warming of the climate in the Falkland Islands. Issue of rising sea levels on birds and warming on extensive kelp beds, which support wider ecosystems of invertebrates, molluscs and fishes, which in turn provide food for birds. Further, there is evidence that rainfall is slowly declining on the Islands and there are periods when ozone depletion is particularly strong. Since the 1990s long term trend in reduction in catch levels in the fishing industry contributed to by climatic conditions and ocean currents which has seen total revenues halve. A series of OTEP and DEFRA funded research projects supporting resilience activities (see below). Twenty-two Important Bird Areas identified. Seventeen Important Plant Areas Identified. Falkland Islands Biodiversity Strategy 2008 – 2018 outlines key action points to counter biodiversity losses and has a specific action plan for climate change research, and the designation of key land, terrestrial and marine biodiversity sites etc.

Low Carbon Development

The Falklands generated 59,000 metric tonnes CO_2 in 2008 and 46,000 in 2009 from the consumption of energy. Significant current investment by FIG and future potential regarding wind farmed renewable energy.

UK Exposure

Excluding defence , the Falklands Islands economically self sufficient since 1998. However, some HMG expenditure (including staff and admin costs in the UK and the Territories), in 2005-06 totalling £813,000. Reputational risks include the significant on-going territorial issues regarding the Falkland Islands with Argentina.

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						
Transportation		X	X			
Agriculture and Fisheries						
Forestry						
Energy Supply and Use						
Industry and Commerce		X	X			
Social Systems						
Livelihoods			X			
Human Health		X	X			

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		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				
Transport	X	X	X		
Public	X	X			
Business	X	X	X		
Residential	X	X			
Industrial Processes	X	X	X		
Agriculture	X	X			
Waste management	X	X			
Land Use, Land Use Change and Forestry	X	X			

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

Annex Six: Emissions Data

57424002/2010/AC7595/NW

time-stamp	12/01/2012 14:01
EmissionUnits	Mt CO2 equivalent

Territory Name	Pollutant	Source Name	Activity / Fuel	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Falkland Islands	CO2	Power stations	Gas oil	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
		Aviation	Aviation spirit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Aviation turbine fuel	0.04	0.02	0.02	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
		Road transport	Diesel	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
			Petrol	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Domestic combustion	Burning oil	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
			Gas oil	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
			Natural gas	0.12	0.13	0.13	0.14	0.14	0.15	0.16	0.16	0.16	0.17	0.17	0.18	0.18	0.18	0.18	0.17	0.18	0.20	0.17	0.14	0.14
		Incineration - clinical waste	Clinical waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		LULUCF	All sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
		Incineration	MSW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CH4	Power stations	Gas oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Aviation	Aviation turbine fuel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Road transport	Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Petrol	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Domestic combustion	Burning oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Gas oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Agriculture	All sources	0.13	0.13	0.12	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.09	0.09	0.08
		Incineration - clinical waste	Clinical waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Incineration	MSW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N2O	Power stations	Gas oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Aviation	Aviation turbine fuel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Road transport	Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Petrol	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Domestic combustion	Burning oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Gas oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Incineration - clinical waste	Clinical waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Agriculture	All sources	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03
		LULUCF	All sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Incineration	MSW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	HFC	F-gas emissions	All sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PFC	F-gas emissions	All sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SF6	F-gas emissions	All sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00