



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

Needs Assessment:
Cayman 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.

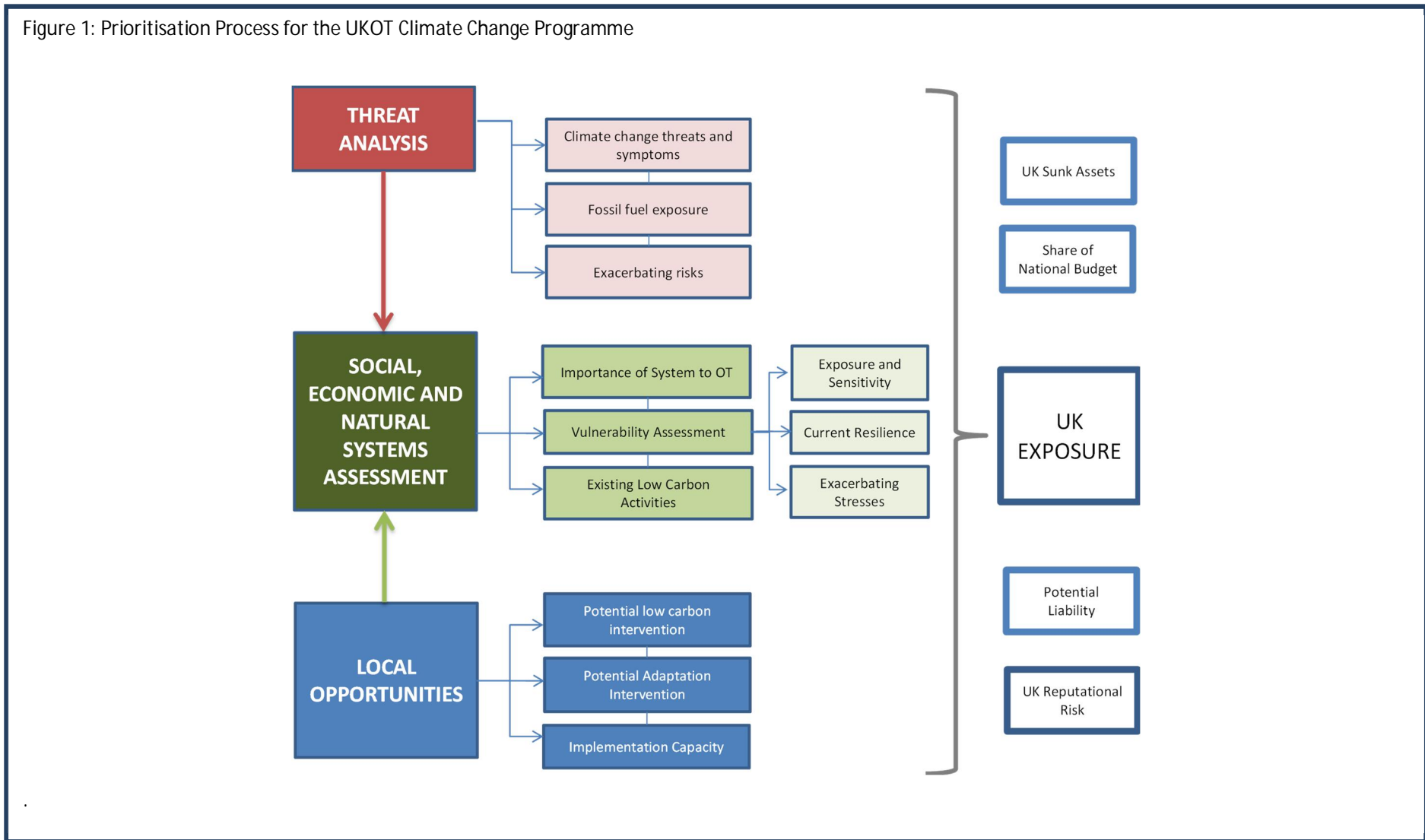
The completed VAM in this report uses a RAG colour coding system to provide a comparative analysis across all of the OTs to feed into the overall programme design. In most cases, data has been included specifically for the later appraisal and business case design process which would have followed.

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: Cayman Islands



KEY INDICATORS	
Population:	55,456 (2010)
GDP (\$):	2.72 billion (2009)
Per Capita GDP (\$):	49,450 (2009)
ODA Entitled:	No
UK Annual Budget Support:	77,000 (2005-2006)
Value of UK Sunk Assets:	N.A.
Key Economic Sectors:	Financial services and tourism

Threat Exposure Analysis

Climate Change Exposure

Located in the Western Caribbean, the three islands that make up the Cayman Islands (Grand Cayman, Cayman Brac and Little Cayman) have a marine subtropical climate with average air temperatures of 27.1°C and average rainfall of 143.3cm 56.41 inches per annum. Typified by a wet warm summer season from mid-May through to November and a dry cool winter season from December through to April, there are large seasonal and spatial differences in the pattern of rainfall with the west coast being significantly wetter than the east.¹

The prevailing winds are east to south from May through October and from the northeast during the cooler winter months of December to April or “Nor’wester season”. The Nor’wester season so called for the strong winds and rough seas and sea swells that arrive from the northerly quadrant affecting the west coasts of the Cayman Islands (CI).

The wet summer months generally coincide with tropical low pressure systems and the “hurricane season” (01 June to 30 November) as storms form in the southern Caribbean and head north into or close to the islands. Nine major hurricane storms have hit Cayman since 1903, most recently Hurricane Paloma in 2008. The strongest to hit the CI in recent years was in 2004, when onshore winds generated by Hurricane Ivan brought major storm surges of up to 9.8 feet and wave heights of around 8 metres, flooding large coastal areas and depositing huge amounts of sand over roads, houses and infrastructure.²

In recent decades a warming trend has been identified. Since the 1950s, a 2°C change has been detected for the region: the number of very warm days is increasing but the number of very cold nights is decreasing.³ 2002 and 2003 were registered as the warmest year on record in the Cayman Islands with an average temperature of 28.4°C.⁴ Patterns of rainfall are also changing, leading to floods in some areas of Cayman Islands and

¹ Hurlston-McKenzie (Department of Environment, DOE) (2010): “Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft” DoE, GCI

² Young (2004):

³ Brown, N., 2008. *Climate change in the UK Overseas: Territories: An Overview of the Science, Policy and You*. Peterborough, UK: Joint Nature Conservation Committee.

⁴ Personal Communication from John Tibbets, Chief CI Meteorological Office

droughts in other areas.⁵ Sea Surface Temperature (SST) in the Caribbean Basin over the past two decades indicate that warming is taking place at between 0.2°C and 0.5°C per decade.⁶

A 2°C to 2.7°C (or 0.02°C to 0.03°C per year) increase in surface air temperature is expected in the CI by 2100.⁷ The Cayman Islands are amongst those islands showing regional variation in rainfall projections, with a decrease of between 10 and 50 mm in annual rainfall totals predicted between 2011 and 2099. Estimates of future sea-level rise within the Caribbean suggest an increase of 12cm to 80 cm in sea levels by 2100 from a 1990 baseline.⁸

Resource Exposure

Electricity is mainly provided by diesel-powered generators, with very little electricity using renewable energy sources (see *Current Abatement Activities*). Total electricity consumption in the CI increased by 160% between 1990 and 2007, reaching just under 600 GWh in 2007. The cost of electricity to the consumer is about 35 cents per kWh. Freshwater resources are limited and^{9,10} reverse Osmosis technology is used on all the Cayman Islands for providing potable water through several desalination plants. Tariffs are roughly equal to US\$0.02 per gallon.

In 2008, the Cayman Islands generated 557,000 metric tonnes CO₂.¹¹

Adaptation and Resilience

Importance to OT

Importance of System to OT

Natural Systems: Habitat classifications for all three islands were completed in 2009 under a Darwin Initiative grant and form the basis of the Cayman Islands National Biodiversity Action Plan 2009 -18. This differentiates between and sets out action plans for Marine, Coastal and Terrestrial Habitats¹². The CI marine and coastal environments are critically important, not just for their biodiversity and ecosystems functions, but to the role in the local tourism economy and the physical protection they provide to the islands; fringing reef and lagoon afford protection to Grand and Little Cayman, sheltering sea grass beds and sandy beaches. Cayman Brac is not afforded this same level of natural protection. The significance of this marine and coastal resource is reflected in the national system of marine protected areas. Around 1/3 of the CI coastal shelf (22,506 acres (91.08km²) (19,311 acres for Grand Cayman, 914 acres for Cayman Brac and 2,281 acres for Little Cayman¹³) is protected

⁵Trotz, U., O., 2008. *Climate Change and Tourism in the Caribbean: Threats and Opportunities*. In: Summary Report ECACC Project Phase 1C- Vulnerability and capacity Assessment for the Cayman Islands Tourism Sector – Training Workshop, Grand Cayman, 2008. [Online] Available at: www.doe.ky/wp-content/uploads/2009/04/CI_VCA_Workshop_Report2.pdf [Accessed on 15 April 2012].

⁶ Simpson et al, 2009. *An Overview of Modelling Climate Change Impacts in the Caribbean Region* [Online] Available at www.caribsav.org/assets/files/7dec09/Key%20Points%20Final%20Caribbean%20CC%20UNDP%20Report.pdf [Accessed on 11 July 2012].

⁷ Hurlston-McKenzie, L-A., J. Olynik, J. Montoya Correa, L. Grant 2011. *Vulnerability and Capacity Assessment of the Climate Change and Sea-Level Rise Impacts on The Cayman Islands' Tourism Sector*. ECACC Technical Report, June 2011. [Online] Available at: www.doe.ky/sustainability/

⁸National Climate Change Committee, 2011. *Achieving a Low Carbon Climate-Resilient Economy: Cayman Islands' Climate Change Policy*. Final Draft Caribbean Community Climate Change Centre Digital Edition.

⁹ Cayman islands Department of Environment, 2009. *Reducing Your Office Footprint – Part.1 Energy*. [Online] Available at: www.doe.ky/reducing-office-footprint-1/ [Accessed on 15 April 2012].

¹⁰Consolidated Water, 2012. *Cayman Water Company Limited ("Cayman Water")*. [Online] Available at: www.cwco.com/html/CaymanWater.html [Accessed on 15 April 2012].

¹¹United Nations Statistic Division, 2012. *Millennium Development Goals*. [Online] Available at <http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crd=>[Accessed 19 04 2012].

¹² Cottam, M., Olynik, J., Blumenthal, J., Godbeer, K.D., Gibb, J., Bothwell, J., Burton, F.J., Bradley, P.E., Band, A., Austin, T., Bush, P., Johnson, B.J., Hurlston, L., Bishop, L., McCoy, C., Parsons, G., Kirkconnell, J., Halford, S. and Ebanks-Petrie, G. (2009): "Cayman Islands National Biodiversity Action Plan 2009" Cayman Islands Government. Department of Environment. Final Formatting and production by John Binns, International Reptile Conservation Foundation.

¹³ *ibid*

through a system which provides three levels of protection from nil disturbance Environmental Zones (there is one 4,169 acre zone (encompassing sea grass beds and mangrove) off Grand Cayman set aside as a “no-use zone”, with no in-water activity permitted and 5 knot surface water speed limit) to actively managed Replenishment Zones and Marine Parks. Important spawning aggregation sites (SPAGS) for the Nassau grouper (*Epinephelus striatus*) are also designated through the Marine Conservation Law (1978), the primary legislation that provides for marine protected areas in the Cayman Islands.¹⁴

Terrestrial habitats are not afforded the same level of protection, but play important roles in water and flood management, as well as supporting a range of endemic bird and plant species. On Grand Cayman mangrove forest and coastal shrubland make up 25% of the land area (tidally flooded mangrove a further 6%. On Cayman Brac 48% is xeromorphic semi-deciduous forest, while Little Cayman is the least urbanised of the islands with substantial tracts of dry shrubland and forest.¹⁵

21 plant species (such as banana orchids), 7 reptiles (e.g. Grand Cayman blue iguana) and 30 land snails are among those listed as endemic to Cayman, along with many endemic subspecies of forest birds (such as Grand Cayman parrot). Various coastal habitats in all three islands have been identified as important nesting habitat for local and migratory birds, such as the tropicbird (*Phaethon lepturus*) habitat along Grand Cayman’s south-central and Cayman Brac’s southeastern coast, and Cayman Brac’s northeastern bluff face for the brown booby colony (*Sula leucogaster*). Little Cayman’s Booby Pond is the largest rookery of Red Footed Booby (*Sula sula*) in the Caribbean. The Cayman Islands host ten Important Bird Areas and a Ramsar site.^{16 17}

Furthermore, nesting by green and loggerhead turtles occurs on beaches throughout all the islands. The lagoons of all three islands also support culturally important marine resources such as queen conch, spiny lobster and whelk¹⁸

Freshwater resources are severely limited on all the CI and potable water is produced through a desalination process.¹⁹

Economic Systems: The CI has a very narrow economic base supported by Financial Services and Tourism. Financial services represent the main economic activity in the Cayman Islands, accounting for about 42.9% of GDP, making the Cayman Islands one of the major banking centres in the world. Based on its extensive marine and coastal resources, tourism represent a further 15% of GDP, while manufacturing, and agriculture and fisheries are limited respectively to 1.0% and 0.4% of GDP.²⁰

Social Systems: The population in 2010 was 55,456.²¹ The population in Cayman Islands had a per-capita GDP of US\$49,450 in 2009²² (one of the highest in the western hemisphere), a life expectancy of 80.8 years and a mortality rate of 6.49 deaths per 1,000 live births.²³ Levels of urbanisation on each CI vary from around 39% of Grand Cayman, 41% of Cayman Brac and only 7% of Little Cayman. On Little Cayman the majority of this development has taken place on the coast, displacing natural buffers.²⁴

¹⁴ Hurlston-McKenzie (Department of Environment, DOE) (2010): “Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft” DoE, GCI

¹⁵ *ibid*

¹⁶ Rayment, M., 2007. *Costing Biodiversity Priorities in the UK Overseas Territories. Final Report*. Plymouth: GHK.

¹⁷ Brown, N., 2008. *Op cit*.

¹⁸ Hurlston-McKenzie (Department of Environment, DOE) (2010): “Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft” DoE, GCI

¹⁹ Cayman Islands Department of Environment, 2009. *Op cit*.

²⁰ Economics and Statistics Office, 2010. *The Cayman Islands’ System of National Accounts 2008-2009*. [Online] Available at: www.eso.ky/pages.php?page=annualnationalaccountsreport [Accessed on 18 April 2012].

²¹ Economics and Statistics Office of the Government of the Cayman Islands (2010): “The Cayman Islands’ 2010 Census Report” [Online] available at [http://www.eso.ky/UserFiles/File/1_1%20Total%20Population\(5\).pdf](http://www.eso.ky/UserFiles/File/1_1%20Total%20Population(5).pdf)

²² *ibidem*, page 5

²³ CIA, 2012. *The World Factbook*. [Online] Available at: www.cia.gov/library/publications/the-world-factbook/geos/cj.html [Accessed on 12 April 2012].

²⁴ Hurlston-McKenzie (Department of Environment, DOE) (2010): “Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft” DoE, GCI

High and sustained levels of GDP growth have led to rapid population growth - an annual rate of over 4% since the 1980s arising from an influx of non-Caymanians to service the finance and tourism sectors which employed 10.1% and 11.4% of the total 2008 workforce, respectively.²⁵

Vulnerability

Sensitivity to Climate Exposure



A 2010 study predicted current and future losses from climate risks (hurricane induced winds, coastal flooding from storm surge and inland flooding from tropical systems) for Cayman and concluded the current climate risk for the CI was already running at 5% of GDP with expected losses of up to 7% by 2030. The contribution of coastal flooding was around 45% of the total damage potential, with estimated losses tripling to around US\$309 by 2030²⁶.

A detailed climate vulnerability assessment of Grand Cayman, Cayman Islands was undertaken in 2009 covering all aspects in detail²⁷ but key aspects can be summarised as:

Natural Systems: The CI's important marine and coastal systems are highly vulnerable to the effects of climate change. Warmer sea temperatures, coupled with increased ocean acidification, are likely to favour coral bleaching events. Important seagrass beds are susceptible to changes in temperature and wave action, including storms and sea level rise²⁸. Stronger storms may damage reefs and reduce the productivity of the reef systems. This in turn may have an effect on low-lying terrestrial systems, as lower levels of natural protection accentuate the effects of sea level rise and the effects of extreme weather events. Storm surge and inland flooding are already significant problems for all three islands. All three CI are very low lying. Grand Cayman has an average elevation of 6ft and maximum elevation of 94 ft, Cayman Brac rises to 145 ft at its highest point and Little Cayman to just over 40 ft.²⁹

Further saltwater intrusion into limited ground water reserves is likely to lead to an increase in the production of potable water through desalination and energy costs and greenhouse gases associated with this process.³⁰ Terrestrial systems face an adaptation imperative to temperature rises and effects of sea level rise and flooding events.

Economic Systems: Impacts on the marine environment are likely to negatively affect tourism with loss of amenity divers and snorkelers. The Cayman Islands', critical infrastructure (sea ports, airports, roads, fuel terminals, utilities, emergency response and key government facilities,) and economic activities that support the main population centres have developed linearly along the coastline or within close proximity to the coast, many in particularly hazard-prone areas³¹. These are especially prone to the effects of beach retreat and erosion and the effects of sea level rise, tropical storms, hurricanes and other extreme weather events. The long term effects of erosion and sea level rise are of most concern, since most tourist and critical infrastructure

²⁵ Economics and Statistics Office (2009): "The Cayman Islands' Labour Force Survey Report Fall 2008". Economics and Statistics Office, Cayman Islands Government, George Town, Grand Cayman, April 2009

²⁶ CCRIF (2010): "Enhancing the Climate Risk and Adaptation Fact Base for the Caribbean: An informational brochure highlighting the preliminary results of the ECA Study.. CCRIF, Grand Cayman, Cayman Islands" cited in Hurlston-McKenzie (Department of Environment, DOE) (2010): "Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft" DoE, GCI

²⁷ Natural Disasters Assessment Consulting Group (2009) "Preliminary Vulnerability Assessment of Grand Cayman, Cayman Islands. A Report to the Government of the Cayman Islands", June 2009.

²⁸ Cottam, M., Olynik, J., Blumenthal, J., Godbeer, K.D., Gibb, J., Bothwell, J., Burton, F.J., Bradley, P.E., Band, A., Austin, T., Bush, P., Johnson, B.J., Hurlston, L., Bishop, L., McCoy, C., Parsons, G., Kirkconnell, J., Halford, S. and Ebanks-Petrie, G. (2009): "Cayman Islands National Biodiversity Action Plan 2009" Cayman Islands Government. Department of Environment. Final Formatting and production by John Binns, International Reptile Conservation Foundation.

²⁹ Hurlston-McKenzie (Department of Environment, DOE) (2010): "Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft" DoE, GCI

³⁰ Trotz, U., O., 2008. *Op cit*.

³¹ Hurlston-McKenzie (Department of Environment, DOE) (2010): "Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft" DoE, GCI

has proved its resilience and design capability during Hurricane Ivan in 2004.³² Limited agricultural productivity is likely to be reduced by temperature changes and a decline in precipitation.³³

Social Systems: Loss of tourism livelihood opportunities is expected. Increases in air temperature could lead to a rise in the occurrence of pests and some disease vectors, contagious diseases and stress-related diseases.³⁴ Flooding events, already common on Cayman bring significant risk of illness both during and in their aftermath during clean-up operations.³⁵

Current Resilience Activities

The Department of Environment (DoE) heads a National Climate Change Committee which is co-ordinating the National planning and policy response to climate change. A multi-sectoral committee was established at the end of 2007 and is made up of representatives from some 10 government departments.³⁶ The group was formed following the inception of the DFID Enhancing the Capacity for Adaptation to Climate Change in the Caribbean (ECACC) project, which has been supported by the Caribbean Community Centre for Climate Change (5Cs). Key outputs from the ECACC project include a detailed technical Green Paper³⁷ and a final draft Climate Change Policy³⁸ which is awaiting final adoption by cabinet. The paper outlines consensus-based interventions to be implemented over the next five years that are required to address priority adverse impacts of climate change to be faced by the CI.

The DoE, with support from the National Trust³⁹ is at the forefront of efforts to support the resilience of natural systems. Current initiatives, such as the CI National Biodiversity Action Plan,⁴⁰ include a number of habitat and species action plans, many of which define activities that are already being implemented (or require support) to increase the resilience of natural systems to climate change. These include measures to support marine and coastal environments (such as the construction of artificial reefs to offset declining reef biodiversity and sinking of ships and emplacement of novelty underwater sculptures, towards bolstering declining natural tourist attractions), safeguarding of seagrass beds, management of mangrove areas (for example mangrove replanting in South Sound carried out by the DoE and Reef Ball Foundation in 2008) and specific species interventions. The DoE has also been working under a Darwin Initiative to enhance the marine protected area system.⁴¹

The Agency for Hazard Management Cayman Islands has overall responsibility for the national hazard management programme⁴² and there have been important regulatory changes to the building code and development planning in order to strengthen Cayman Islands' preparedness to hurricanes (though still

³² Economic and Statistics Department (ESO) Cayman Islands Government (2005): "The Impact of Hurricane Ivan on the Cayman Islands", published by ECLAC/UNDP and available on line from

http://www.caymanprepared.gov.ky/portal/page?_pageid=1143,1482605&_dad=portal&_schema=PORTAL [accessed 19 07 2012]

³³ Trotz, U., O., 2008. *Op cit*.

³⁴ Brown, R., 2008. *Overview of the Cayman Islands Tourism Sector*. In: Summary Report ECACC Project Phase 1C- Vulnerability and capacity Assessment for the Cayman Islands Tourism Sector – Training Workshop, Grand Cayman, 2008. [Online] Available at: www.doe.ky/wp-content/uploads/2009/04/CI_VCA_Workshop_Report2.pdf [Accessed on 15 April 2012].

³⁵ http://www.caymanprepared.gov.ky/portal/page?_pageid=3701,6817371&_dad=portal&_schema=PORTAL [accessed 19 07 2012]

³⁶ Reprinted by the Department of Environment from the Cayman Net news (31st December 2007): "Climate change taskforce established" <http://www.doe.ky/wp-content/uploads/2009/04/CaymanClimateChangeWorkGroup.pdf> [accessed 19 07 2012]

³⁷ Hurlston-McKenzie (Department of Environment, DOE) (2010): "Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft" DoE, GCI

³⁸ National Climate Change Committee (2011): "Achieving a Low Carbon Climate-Resilient Economy: Cayman Islands' Climate Change Policy" Produced by the National Climate Change Committee for presentation to the Cabinet of the Cayman Islands – Final Draft September 2011 Technical Report 5C/ECACC 11-09-02 Digital Edition.

³⁹ National Trust Cayman Islands, 2012. *Contribution to Government Efforts*. [Online] Available at: www.nationaltrust.org.ky/environment/contribute.html [Accessed on 18 April 2012]

⁴⁰ Cottam, M., Olynik, J., Blumenthal, J., Godbeer, K.D., Gibb, J., Bothwell, J., Burton, F.J., Bradley, P.E., Band, A., Austin, T., Bush, P., Johnson, B.J., Hurlston, L., Bishop, L., McCoy, C., Parsons, G., Kirkconnell, J., Halford, S. and Ebanks-Petrie, G. (2009): "Cayman Islands National Biodiversity Action Plan 2009" Cayman Islands Government. Department of Environment. Final Formatting and production by John Binns, International Reptile Conservation Foundation.

⁴¹ UK Overseas Territories Conservation Forum, 2012. *The Cayman Islands: The Future of Unique Forests Hangs in the Balance*. [Online] Available at: www.ukotcf.org/territories/cayman.htm [Accessed on 17 April 2012]

⁴² http://www.caymanprepared.gov.ky/portal/page?_pageid=3701,6816368&_dad=portal&_schema=PORTAL [accessed 19 07 2012]

potential for improvements – see *Section on Exacerbating Stresses*). Sector plans have also been developed, for example for the health sector.⁴³ The Red Cross and Hazard Management Cayman Islands continue to train community disaster response teams.

From a planning and policy perspective the framework is in place for the CI. The CI are also able to draw on some of the longest time series of meteorological and environmental data in the region.⁴⁴ There is not so much data readily available to support wider specific resilience activities beyond the conservation work of the DoE and National Trust.

Activities in the field of hydrology and water resources, tourism and energy supply and use are reported in *Current Abatement Activities*.

Exacerbating Stresses



The Cayman Islands are low lying and therefore particularly vulnerable even to small increases in sea level.^{45,46} It is estimated that a 0.25m rise in sea level would inundate nearly 8% of all land cover in the Cayman Islands affecting between US\$28 and US\$41.5 million in real estate across all sectors.⁴⁷ Part of this is because the development of coastal road corridors has locked in development in areas that are prone to sea level rise and beach retreat. During recent storm events, damage has not come from wind as in other Caribbean islands (generally structures are well built), but through the effects of flooding with residential and commercial development often only meters above sea level⁴⁸. It is believed that it was the high standard of built infrastructure, especially shelter accommodation and other critical infrastructure that kept the loss of life and injury so low following Hurricane Ivan in 2004⁴⁹.

Options for retreat are limited as evidenced by events in Cayman Brac. Here, development is moving inland but into environmentally sensitive areas,⁵⁰ which is reducing the adaptive capacity of natural systems storing up further problems in the future.

More widely, economic success and exponential population growth are taking a toll on the Cayman Islands, with on-going deforestation threatening mangrove wetlands and dry forests on all the three islands.⁵¹ Tourism development is contributing to the stress on natural resources and infrastructure.⁵²

Some current regulations do not encourage good adaptation. South Shore Coves redeveloped coastal property damaged in Ivan by placing the buildings on pilings, however planning permission restricted ground floor height to 6'6" because it would be considered another habitable space otherwise⁵³. A one size fits all building code may also not be appropriate given the particular vulnerability of some low lying areas of coast line⁵⁴.

The existing susceptibility to heavy rain, tropical storms and hurricanes are likely to exacerbate problems of flooding, storm surge and sea level rise. Although Hurricane Ivan is held as an example of what can happen (during that event extensive flooding and damage to critical infrastructure on all three islands), CI suffers from

⁴³ Brown, N., 2008. *Op cit*.

⁴⁴ Hurlston-McKenzie (Department of Environment, DOE) (2010): "Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft" DoE, GCI

⁴⁵ Cayman Islands Department of Environment, 2009. *Sustainable Development Unit Newsletter – Issue 2 – Climate Change Adaptation in the Cayman Islands*. [Online] Available at: www.doe.ky/wp-content/uploads/2009/04/SDU%20News%20Issue2.pdf [Accessed on 15 April 2012].

⁴⁶ Cayman Islands Department of Environment, 2009. *Sustainable Development Unit Newsletter – Issue 2 – Climate Change Adaptation in the Cayman Islands*. [Online] Available at: www.doe.ky/wp-content/uploads/2009/04/SDU%20News%20Issue2.pdf [Accessed on 15 April 2012].

⁴⁷ Hurlston-McKenzie, L-A., J. Olynik, J. Montoya Correa, L. Grant 2011. *Op cit*.

⁴⁸ Natural Disasters Assessment Consulting Group (2009) "Preliminary Vulnerability Assessment of Grand Cayman, Cayman Islands. A Report to the Government of the Cayman Islands", June 2009.

⁴⁹ *ibid*

⁵⁰ Hurlston-McKenzie, L-A., J. Olynik, J. Montoya Correa, L. Grant 2011. *Op cit*.

⁵¹ UK Overseas Territories Conservation Forum, 2012. *The Cayman Islands: The Future of Unique Forests Hangs in the Balance*. [Online] Available at: www.ukotcf.org/territories/cayman.htm [Accessed on 17 April 2012]

⁵² Brown, R., 2008. *Op cit*.

⁵³ Hurlston-McKenzie (Department of Environment, DOE) (2010): "Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft" DoE, GCI

⁵⁴ *ibid*

extensive flooding during heavy rainfall events. Most recently in May 2012 flooding on Grand Cayman closed schools in George Town.⁵⁵

Although the CI have not been hit by heavy seismic activity, the islands lie on an active geological fault and could be subject to the effects of earthquake or earthquake related tsunami. In December 2004, an earthquake, magnitude 6.8 occurred approximately 20 miles to the south of Georgetown, Grand Cayman.⁵⁶

Finally, the lack of political will is cited continuously as a factor mitigating an effective response.⁵⁷

Future Opportunities

Potential Adaptation Interventions

The framework for adaptation is clearly defined in the Final Draft Climate Change Policy *Achieving a Low Carbon Climate-Resilient Economy: Cayman Islands' Climate Change Policy*⁵⁸ which sets out a road map for future interventions. The key to all of these potential projects, programmes and mainstreaming concepts is buy-in from the whole of the CI Government. The Climate Change Green Paper (2010) notes *"The Cayman Islands is skilled at generating sectoral plans through national stakeholder consultations and public-private sector collaboration, however it falls short in implementation of these plans."*⁵⁹

Beyond natural systems, a summary of the general intervention areas detailed in the Climate Change Policy is detailed below. The majority are focused on improving land use planning and implementing the provisions of existing polices and strategies. Focus areas include adapting to the key risks posed by flooding and sea level rise to infrastructure in coastal areas; ensuring an effective land use, infrastructure and building planning and permitting regime that minimises the effects of infrastructure retreat in-land and working for effective conservation management to assist with the resilience of natural systems. Key principles include:

- Enhance the resilience of existing critical infrastructure to climate change impacts, while avoiding the construction of new infrastructure in vulnerable areas or with materials prone to climate hazards;
- Promote water conservation and improved rainwater harvesting while reducing impacts from flooding and enhancing the resilience of natural water resources;
- Enhance the resilience and natural adaptive capacity of terrestrial, marine and coastal biodiversity and ecosystems;
- Minimise the vulnerability of insured and mortgaged properties to climate change impacts;
- Strengthen food security by promoting increased use of locally produced food products and appropriate technologies; and,
- Create and maintain a more environmentally responsible tourism industry while enhancing the resilience of tourism infrastructure and facilities to climate change impacts.

The Policy proposes the establishment of a Climate Change Trust Fund to assist in funding adaptation measures. Rayment (2007) estimated that £3.2 million were needed annually over a period of five years to meet biodiversity priorities alone.⁶⁰

The Cayman Islands National Biodiversity Action Plan 2009 provides further detailed guidance on a range of conservation related interventions.⁶¹

⁵⁵ http://www.caymanprepared.gov.ky/portal/page?_pageid=3701.6817371&_dad=portal&_schema=PORTAL [accessed 19 07 2012]

⁵⁶ Natural Disasters Assessment Consulting Group (2009) "Preliminary Vulnerability Assessment of Grand Cayman, Cayman Islands. A Report to the Government of the Cayman Islands", June 2009

⁵⁷ Hurlston-McKenzie (Department of Environment, DOE) (2010): "Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft" DoE, GCI

⁵⁸ National Climate Change Committee, 2011. *Op cit.*

⁵⁹ Hurlston-McKenzie (Department of Environment, DOE) (2010): "Climate Change Issues for Cayman Islands: Towards A Climate Change Policy – Green Paper Consultative Draft" DoE, GCI

⁶⁰ Rayment, M., 2007. *Op cit.*

Implementation Capacity

The Department of Environment (DoE) heads a National Climate Change Committee which is co-ordinating the National planning and policy response to climate change. A multi-sectoral committee was established at the end of 2007 and is made up of representatives from some 10 government departments.⁶² The DoE is the lead department, co-ordinating the national response. The DoE acts as an advisor to the CI Government on environmental and climate change issues while also managing a system of Marine Protected Areas around all three Cayman Islands and conducting research and monitoring of natural resources to inform these management and advisory activities. The Department employs 35 people; the Sustainable Development Unit (SDU), set up in July 2006 is the focal point for national policy level strategy.⁶³ Three FCO UK based staff focus on Cayman Islands.⁶⁴ On disaster management and response, the co-ordinating agency, Hazard Management Cayman Islands reports some staff shortage as a constraint to active fulfilment of its mandate but is reporting progress against the Hyogo Framework for Action⁶⁵.

The National Trust for the CI work closely with the DoE.⁶⁶ They spend significant sums on environmental policy, survey, research and monitoring work, and management of protected areas. The Trust has raised approximately US\$1 million in recent years from private donors and spent it on land purchase and management of protected areas.⁶⁷

A number of other government and civil society organisations are involved in the climate change agenda, but the key is the wider engagement of government stakeholders and the formal adoption of the Climate Change Policy.

A National Climate Change Council is proposed to oversee and monitor the implementation of the policy.

Low Carbon Development (Source)

Current Emissions

Share of Current Emissions

The Cayman Islands were responsible for the production of 557,000 metric tonnes CO₂ in 2008.⁶⁸ The bulk of CO₂ emissions in the Cayman Islands energy sector was attributed to power generation (69%), with road transport accounting for over a quarter (27%) of emissions and international shipping comprising the remaining total (4%).⁶⁹

⁶¹ Cottam, M., Olynik, J., Blumenthal, J., Godbeer, K.D., Gibb, J., Bothwell, J., Burton, F.J., Bradley, P.E., Band, A., Austin, T., Bush, P., Johnson, B.J., Hurlston, L., Bishop, L., McCoy, C., Parsons, G., Kirkconnell, J., Halford, S. and Ebanks-Petrie, G. (2009). Cayman Islands National Biodiversity Action Plan 2009. Cayman Islands Government. Department of Environment. Final Formatting and production by John Binns, International Reptile Conservation Foundation.

⁶² Reprinted by the Department of Environment from the Cayman Net news (31st December 2007): "Climate change taskforce established" <http://www.doe.ky/wp-content/uploads/2009/04/CaymanClimateChangeWorkGroup.pdf> [accessed 19 07 2012]

⁶³ Cayman Islands Department of Environment, 2012. *Sustainable Development Unit*. [Online] Available at: www.doe.ky/sustainability/sustainable-development-unit/ [Accessed on 18 April 2012]

⁶⁴ National Audit Office, 2007. *Foreign Commonwealth Office - Managing risk in the Overseas Territories*. London: The Stationary Office

⁶⁵ Prevention Web (2010): "Cayman Islands National progress report on the implementation of the Hyogo Framework for Action (2009-2011) - interim" An HFA Monitor update published by PreventionWeb

http://www.preventionweb.net/english/hyogo/gar/2011/en/bgdocs/hfa/15945_cym_NationalHFAprogress_2009-11.pdf

⁶⁶ UK Overseas Territories Conservation Forum, 2012. *The Cayman Islands: The Future of Unique Forests Hangs in the Balance*. [Online] Available at: <http://www.ukotcf.org/territories/cayman.htm> [Accessed on 17 April 2012]

⁶⁷ National Trust Cayman Islands, 2012. *Contribution to Government Efforts*. [Online] Available at:

<http://www.nationaltrust.org.ky/environment/contribute.html> [Accessed on 18 April 2012]

⁶⁸ United Nations Statistic Division, 2012. *Millennium Development Goals*. [Online] Available at

<http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crd=-> [Accessed 19 04 2012].

⁶⁹ Hurlston-McKenzie et al., 2011. *Climate Change Issues for the Cayman Islands: Towards a Climate Change Policy*. A Technical Report of the National Climate Change Committee, 2011. [Online] Available at: <http://www.doe.ky/sustainability/>

GHG Abatement

Abatement Potential

Reducing Greenhouse Gas Emissions, in line with agreed national targets, through promoting energy conservation, reducing energy use and encouraging greater use of renewable energy is reported among the aims of the Final Draft of *Achieving a Low Carbon Climate-Resilient Economy: Cayman Islands' Climate Change Policy*.⁷⁰ Although there are currently no binding targets in force, the Government of the Cayman Islands have committed to satisfying commitments under the UNFCCC. These include the collection and development of data that can be used in the UK greenhouse gases inventory and the formulation and implementation of a mitigation programme.

Current Abatement Activities

Currently, very little electricity is generated using renewable energy sources in the Cayman Islands. The Caribbean Utilities Company (CUC) have recently received a significant response to its request for expression of interest for the introduction of 13MW of renewable energy generation on Grand Cayman,⁷¹ and Cayman Brac Power & Light are trying to install 5MW of wind capacity in Cayman Brac. At the commercial and residential levels, solar water heating systems and small-scale energy systems have been installed in some businesses and the Consumer Owned Renewable Energy (CORE) programme has made it possible for consumers in Grand Cayman to connect their small-scale renewable energy systems to the CUC distribution net.⁷² This programme is supported by a Government import duty waiver policy applied to all domestic installations of these systems, e.g. home solar panels. The number of businesses that install renewable energy technologies continues to grow rapidly. A biofuel processing plant is also located in the Cayman Islands. It creates biofuel out of used cooking oil which is then mixed with diesel fuel and used in cruise ship tenders, heavy equipment and some converted domestic vehicles. Currently the plant produces 6,000 litres a week of refined oil.⁷³

The Cayman Islands Environmental Project for the Tourism Sector (CEPTS) was launched in 2008 to improve and instil sustainable practices in the operation of hotels and tourist attractions.⁷⁴ These include energy conservation and efficiency measures that will result in GHG reduction over time. The DoE annually assists NGOs and CBOs to coordinate tree planting initiatives across the islands and has planted native trees in its car park and installed water drums to capture rainwater. The DoE has also piloted a Government facility energy audit conducted by the PWD, which has itself installed programmable A/C controls to replace their old thermostats (cost: US\$4,000; savings in six months: US\$36,000).⁷⁵ The DoE has also produced energy conservation outreach material for homeowners and businesses, including an *Energy Saving Checklist* and a *Reducing Your Office Footprint Guide* on energy.

The development of Lighthouse Point, a recently built diving and accommodation centre, evidences this approach: it is fitted with solar photovoltaic, wind turbine, super-efficient lighting, highly efficient A/C and energy equipment, as well as water conservation features.⁷⁶

⁷⁰National Climate Change Committee, 2011. *Op cit*.

⁷¹ Caribbean Utilities Company, 2012. "Great Response to CUC's Invitation for 13 megawatts (MW) of Alternative Energy," Press Release, March 6, 2012. [Online] Available at: www.cuc-cayman.com/PDF/off%20the%20wire/fiscal%202012/response%20alternative%20energy%20060312.pdf

⁷² Cayman islands Department of Environment, 2009. *Reducing Your Office Footprint – Part. 1 Energy*. [Online] Available at: www.doe.ky/reducing-office-footprint-1/ [Accessed on 15 April 2012].

⁷³ Cayman Islands Department of Environment, 2009. *Sustainable Development Unit Newsletter – Issue 3– Kyoto & Green Gallons*. [Online] Available at: www.doe.ky/wp-content/uploads/2009/07/sdu-news-issue3_kyoto-green-gallons.pdf [Accessed on 15 April 2012].

⁷⁴ Cayman Islands Department of Environment, 2009. *Sustainable Development Unit Newsletter – Issue 1– Greening Tourism and Government – a CEPTS Progress Update*. [Online] Available at: <http://www.doe.ky/wp-content/uploads/2009/04/SDU%20News%20Issue1.pdf> [Accessed on 15 April 2012].

⁷⁵ Cayman Islands Department of Environment, 2009. *Sustainable Development Unit Newsletter – Issue 5 – Reducing Your Office Footprint – World Environment Day – Energy Audits* [Online] Available at: <http://www.doe.ky/wp-content/uploads/2009/08/SDUNewsIssue5.pdf> [Accessed on 15 April 2012].

⁷⁶ Cayman Islands Department of Environment, 2009. *Sustainable Development Unit Newsletter – Issue 4– Earth Week Review 2009*. [Online] Available at: www.doe.ky/wp-content/uploads/2009/08/sdu-news-issue4_earth-week-2009.pdf [Accessed on 15 April 2012].

Future Opportunities

Potential LCD Intervention

The Final Draft of *Achieving a Low Carbon Climate-Resilient Economy: Cayman Islands' Climate Change Policy*⁷⁷ reports among its aims to reduce Greenhouse Gas Emissions, in line with agreed national targets, through promoting energy conservation, reducing energy use and encouraging greater use of renewable energy.

Through the National Energy Policy currently under development, the Government of the Cayman Islands aims among other things to encourage and promote energy conservation and efficiency throughout the public and private sectors. The DoE has pre-emptively developed initiatives targeted at both the residential and commercial sectors by hosting fairs and expos that allow alternative energy suppliers to liaise with interested homeowners. Production of informative material has also been generated, such as a 2009 guide for the business community centred on increasing energy efficiency - in lighting, cooling, equipment and appliances and water heating systems- and promoting the use of renewable energies, such as solar photovoltaic, wind turbines, solar water heating systems and ground-source heat pumps.⁷⁸ In the other sectors, GHG emissions could also be reduced through the implementation of energy from waste, improved building design and the use of more efficient vehicles and electric vehicles.⁷⁹

Implementation Capacity

The Sustainable Development Unit (SDU) at the DoE is responsible for reporting to the UK on commitments under the Kyoto Protocol.⁸⁰ As one goal of the National Energy Policy is to reduce the country's carbon footprint in line with agreed national targets, a responsible agency will have to be determined to monitor the successful implementation of policy measures and other interventions geared at achieving this goal.

UK Exposure

UK Sunk Assets

A figure of UK Sunk assets was not available.

Absolute Value of UK Transfer

The UK Transfer from FCO amounted to £77,000 in 2005-2006.⁸¹ The UK also continues to bear costs to assure the quality of Cayman Islands civil aviation regulatory system: these were estimated to be £88,000 in 2007.

Share of National Budget from UK Transfer

The total budget of Cayman Islands Government for 2011-2012 was equal to about CI\$704 million.⁸² A precise figure of the share of the budget provided by the UK government was not available, but it is very likely to be less than small.

⁷⁷National Climate Change Committee, 2011. *Op cit*.

⁷⁸Cayman Islands Department of Environment, 2009. *Reducing Your Office Footprint – Part. 1 Energy*. [Online] Available at: www.doe.ky/reducing-office-footprint-1/ [Accessed on 15 April 2012].

⁷⁹Cayman Islands Department of Environment, 2009. *Sustainable Development Unit Newsletter – Issue 3– Kyoto & Green Gallons*. [Online] Available at: www.doe.ky/wp-content/uploads/2009/07/sdu-news-issue3_kyoto-green-gallons.pdf [Accessed on 15 April 2012].

⁸⁰Cayman Islands Department of Environment, 2012. *Sustainable Development Unit*. [Online] Available at: www.doe.ky/sustainability/sustainable-development-unit/ [Accessed on 18 April 2012]

⁸¹National Audit Office, 2007. *Op cit*.

⁸²Cayman Islands Government, 2011. *2011/2012 Budget - Annual Plan and Estimates* [Online] Available at: www.bmu.gov.ky/_files/file_118.pdf [Accessed on 7 June 2012]

Potential Liability

The potential risk to the UK has reduced due to vigorous economic growth and financial management.⁸³ However, the UK is responsible for the associated costs of natural disasters/extreme weather events. For example, the UK provided assistance by airlifting 5,000 tarpaulins and telecommunications equipment into Grand Cayman in the aftermath of Hurricane Ivan in 2004.⁸⁴

The Cayman Islands are among the signatories of the following multilateral environmental agreements:⁸⁵

- Convention on Biological Diversity (CBD)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- Convention on the Conservation of Migratory Species of Wild Animals (CMS)
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter – the London Convention and the London Protocol
- Ramsar Convention on Wetlands of International Importance
- Vienna Convention for the Protection of the Ozone Layer
- Montreal Protocol on Substances that Deplete the Ozone Layer
- Framework Convention on Climate Change and its Kyoto Protocol

Local government responsibility for honouring international agreements of this kind is also referenced in the Environmental Charter signed in 2011, which is currently under review.⁸⁶

Reputational Risks

In the aftermath of Hurricane Ivan there was some local resentment over the perceived lack of support from the UK.

Offshore financial services contribute significant revenue in the Cayman Islands and damage to this sector could lead to increased UK liabilities. Moreover, there is evidence that the Cayman Islands are used as a transshipment point for illegal immigration toward USA and drug commerce towards Europe and USA.⁸⁷⁸⁸ Illegal immigration presents a humanitarian challenge and places pressure on public finances if immigrants have to be repatriated at the cost of the Cayman Islands Government. Detaining any illegal immigrants prior to deportation is also putting further pressure on the already over capacity prison facilities, and was a contributing factor in a prison riot in 1999.⁸⁹

⁸³National Audit Office, 2007. *Op cit.*

⁸⁴National Audit Office, 2007. *Op cit.*

⁸⁵DEFRA, 2012. *The Environment in the United Kingdom's Overseas Territories: UK Government and Civil Society Support.* London, UK: DEFRA

⁸⁶National Trust Cayman Islands, 2012. *Contribution to Government Efforts.* [Online] Available at: www.nationaltrust.org/ky/environment/contribute.html [Accessed on 18 April 2012]

⁸⁷National Audit Office, 2007. *Op cit.*

⁸⁸CIA, 2012. *The World Factbook.* [Online] Available at: www.cia.gov/library/publications/the-world-factbook/geos/cj.html [Accessed on 12 April 2012].

⁸⁹National Audit Office, 2007. *Op cit.*

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.

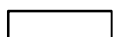
Implementation Capacity	Current (March 2012) capacity to design, implement and monitor all related low carbon / adaptive capacity activities. This includes all current resource constraints (i.e. funding, local personnel capacity, lack of personnel, supportive infrastructure etc.) and opportunities.
Importance 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 biodiversity) 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)	<p>Ecosystems – A community of living (plants and animals) and non-living things (climate, landscape) which interact together and affect each other.</p> <p>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.</p> <p><i>Source: Brown, 2008ⁱ</i></p>
Hydrology and Water resources	<p>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).</p> <p>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.</p> <p><i>Source: Gray, 2010ⁱⁱ; Parry et al., 2007ⁱⁱⁱ</i></p>
Tourism	<p>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</p> <p><i>Source: UNWTO, 2011^{iv}</i></p>
Transportation	<p>A system of conveying people, goods, etc., from one place to another.</p> <p>The definition includes water, air, and land transport.</p>
Agriculture and Fisheries	<p>Agriculture- The science or practise of cultivating the soil and rearing animals</p> <p>Fisheries – The occupation of catching or rearing fish</p>
Forestry	<p>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</p> <p><i>Source: FAO, 2004^v</i></p>
Energy Supply and Use	<p>Energy supply - Extraction, conversion, and transportation of fuels and electricity to ultimate end use</p> <p>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</p> <p><i>Source: Wilbanks et al., 2008^{vi}</i></p>
Industry and Commerce	<p>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.</p> <p>Commerce – Commerce is the exchange or buying and selling of commodities. In our definition it includes trade, retail and other commercial activities.</p>
Human Health	<p>Human health includes physical, social and psychological well-being.</p> <p>Society – Society includes <i>infrastructures, human settlements</i> and <i>social issues</i>.</p> <p><i>Infrastructures</i> are systems designed to meet relatively general human needs, often through largely or entirely public utility-type institutions. <i>Infrastructures</i> 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). <i>Human settlements</i> comprise physical capital (buildings) where most of the world’s population live. <i>Social issues</i> include all the factors relating to human society and its members, concerning the way of life of the local population (livelihoods and welfare).</p> <p><i>Source: Parry et al., 2007</i></p>

HDI/ Livelihoods/ Poverty	<p>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.</p> <p>Livelihoods - A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living.</p> <p>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.</p> <p><i>Source: Chambers and Conway, 1991^{vii}</i></p>
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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 <i>Natural Systems</i> <i>Economic Systems</i>	Bio-diversity characterised by high levels of endemic / endangered species and / or territory with internationally recognised environmental designation ¹ Critical levels of water stress Dominant contribution to OT GDP (>20%)	Bio-diversity characterised by presence of endemic / endangered species and internationally recognised environmental designation Moderate levels of water stress Significant contribution to OT GDP (5%-20%)	Bio-diversity characterised by low levels of endemic / endangered species and no internationally recognised environmental designation Limited levels of water stress Limited contribution (<5%) to OT GDP	Bio-diversity characterised by very low levels of endemic / endangered species and no internationally recognised environmental designation No water stress No contribution (0%) to OT GDP

¹ As identified by IUCN redbook.

#		Red	Red/Amber	Amber/Green	Green
	<i>Social Systems</i>	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: Cayman 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		
3 Decrease in snow cover and ice		
4 Heat waves		
5 Heavy precipitation events/floods		
6 Extreme storm events		
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	

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

Cayman Islands

Summary
<p>The Cayman Islands are a group of three islands in the Caribbean covering 262 sq km. Population of 55,456. Financial services and tourism main contributors to GDP (\$2.72 billion).</p> <p>Threat Exposure Analysis Experienced events: since 1950s, air temperatures increased by 2°C; number of very warm days increased but number of very warm nights decreased. 2002 and 2003 warmest years on record in Cayman Islands. Changing pattern of rainfall. Sea Surface Temperature (SST) warmed by 0.2°C to 0.5°C per decade since 1990s. Expected events (by 2100): air temperatures to increase by 2°C to 2.7°C; decrease in total annual rainfall between 10mm and 50mm; sea level to increase between 12 cm and 80 cm; increase in intensity of hurricanes/ tropical storms expected. Electricity produced through diesel generators. Potable water generated through desalination processes. 557,000 metric tonnes CO2 generated in 2008.</p> <p>Adaptation and Resilience Presence of more than 60 endemic species of flora and fauna. Limited freshwater resources available. Financial services (43% of GDP) and tourism (15% of GDP) main economic activities. Per-capita GDP of US\$49,450 and life expectancy of 80.8 years. Expected loss of marine and terrestrial biodiversity. Coral reefs under threat; negative impact on tourism. Damages to coastal infrastructures and tourist accommodations by hurricanes/ tropical storms. Negative impacts on agriculture and adverse consequences for livelihood and food security. 10 Important Bird Areas and 1 Ramsar Conservation Wetland of International Importance designated, as well as several reserves. On-going projects for the protection of biodiversity. National Climate Change Policy and Climate Change Public Education and Outreach Strategy under development. Regulatory changes in the building code and development planning conducted. Achieving a Low Carbon Climate-Resilient Economy: Cayman Islands' Climate Change Policy drafted. National Trust and DOE responsible for environmental conservation.</p> <p>Low Carbon Development 557,000 metric tonnes CO2 generated in 2008. No binding targets enforced but commitments to reduce GHGs. Installation of wind turbines ongoing. Solar water heating systems and small-scale energy systems installed in some businesses. Presence of a biofuel plant. Project to instill sustainable practices into the tourism sector. Strong focus on the reduction of energy consumed by the commercial sector. Sustainable Development Unit of DoE responsible for reporting to the UK on commitments under the Kyoto Protocol.</p> <p>UK Exposure UK Transfer to Cayman Islands (entirely from FCO) equal to £77,000 in 2005-2006 (less than 2% of National Budget). UK providing support to civil aviation regulatory system. Cayman Islands signatory of several multilateral environmental agreements. Perceived lack of support from UK in the aftermath of Hurricane Ivan (2004). Transhipment point for illegal immigrants and drugs.</p> <p>Exacerbating Risks Low lying islands; Population growth; Increased tourism; Deforestation</p>

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	Vulnerability (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	Red	Red	Orange	Red	Green	Orange
	Hydrology and Water resources	Red	Red	Orange	Red	Green	Orange
Economic	Tourism	Red	Red	Orange	Yellow	Green	Orange
	Transportation	Green	Orange	Orange	Yellow	Green	Orange
	Agriculture and Fisheries	Green	Orange	Orange	Yellow	Green	Orange
	Forestry	Green	Orange	Red	Red	Green	Orange
	Energy Supply and Use	Orange	Green	Orange	Yellow	Green	Orange
Social Systems	Industry and Commerce	Red	Green	Orange	Green	Green	Orange
	HDI/Livelihoods/Poverty	Green	Orange	Orange	Green	Green	Orange
	Human Health	Green	Red	Orange	Green	Orange	

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

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

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, conservation 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 desalination; 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	SBA	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 monitoring of energy consumption; Introduction of LCD screens	Adoption of renewable energy sources: wind turbine and solar photovoltaic systems; Energy efficient retrofits 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



