



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

Needs Assessment:
St Helena

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.

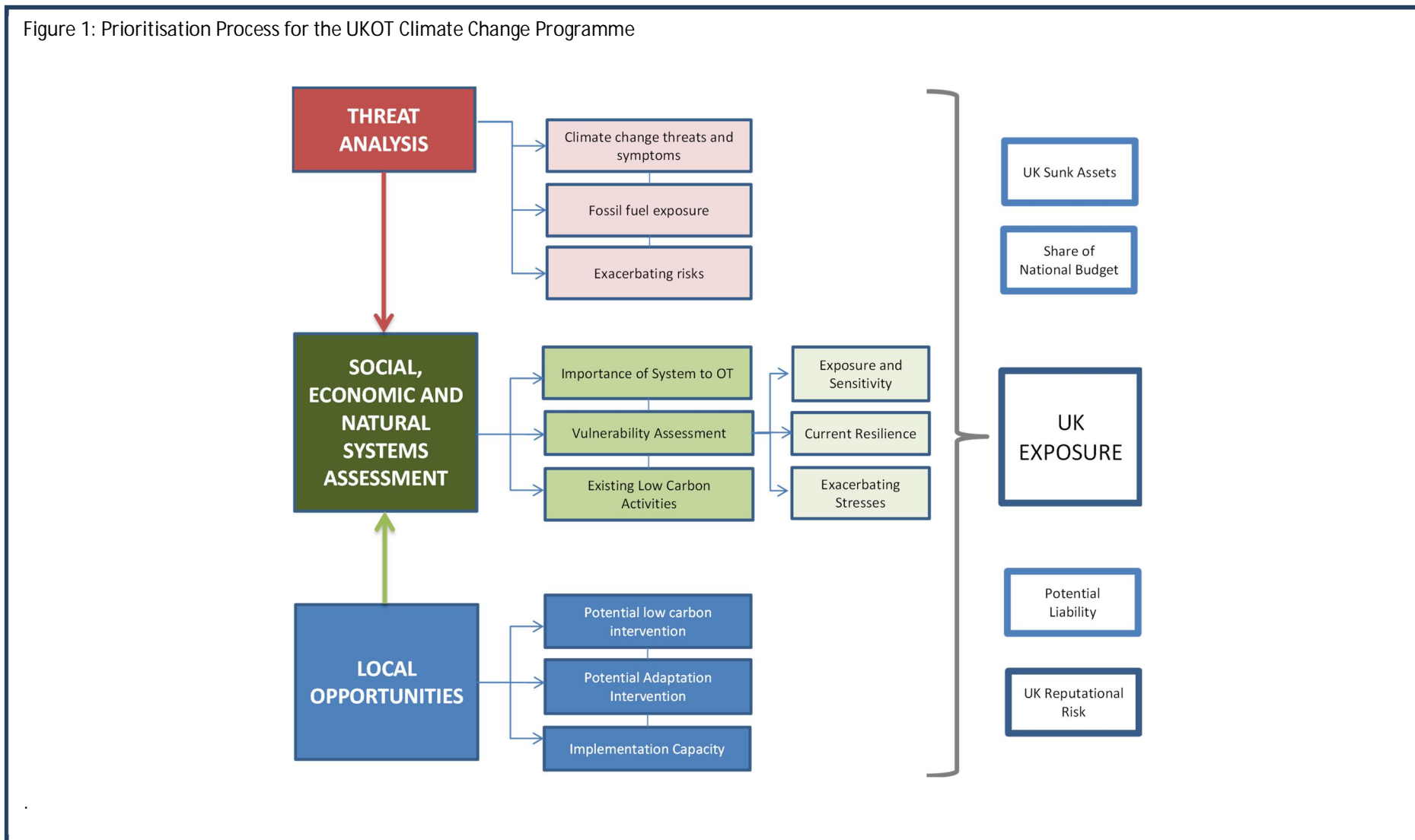
The completed VAM in this report uses a RAG colour coding system to provide a comparative analysis across all of the OTs to feed into the overall programme design. In most cases, data has been included specifically for the later appraisal and business case design process which would have followed.

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: St Helena



KEY INDICATORS	
Population:	4,077 (2008)
GDP (\$):	15.5 million (2009/10)
Per Capita GDP (\$):	3,875 (2009/10)
ODA Entitled:	Yes
UK Annual Budget Support:	23.5 million
Value of UK Sunk Assets:	N.A.
Key Economic Sectors:	Tourism, Fisheries and Agriculture

Threat Exposure Analysis

Climate Change Exposure



Located in the South Atlantic over 4,000 miles from the UK, 700 miles southeast of Ascension Island and 1,700 miles from South Africa, the 47 square miles of the island of St Helena supports one of the most remote populations in the world. The climate is kept mild and equable by the southeast trade winds and temperatures range from 14-32 degrees centigrade in the summer and 14-26 degrees centigrade in winter¹. Rainfall is often extremely localised, creating desert-like conditions of the outer part of the island where 175mm of rain falls per year, compared to the Central Peaks area where cloud and mist accumulate bringing 290 days of overcast conditions and 1050mm of rain each year².

Metrological records for the period 1893-1999 indicate a drying trend with decreasing levels of precipitation (10mm/100 years), increasing air temperature (0.9°C/100 years) and decreasing air pressure (0.6hPa/100 years).³ Although two tropical storms developed in 2001 and 2004 in the South Atlantic, they are considered as atypical and isolated events.⁴

This drying trend is expected to continue. Research points to a strong warming trend in air temperature (2°C in the next 60 years) and to increases in sea temperature, rises in sea level and a slight decrease in rainfall.⁵ Isolated storm events do not make it possible to predict clearly whether such extreme weather events will become the norm in the region in the future.⁶

¹Entec (2009): "St Helena Wharf Improvement Project Environmental Statement 2009" produced by Entec and Nicholas O'Dwyer for SHG

²Kew Royal Botanical Gardens, 2012: "St Helen" <http://herbaria.plants.ox.ac.uk/bol/helena/>

³Feistel, R. and Hagen, E., 2003. *Climatic changes in the subtropical Southeast Atlantic: the St. Helena Island Climate Index (1893-1999)*. Progress in Oceanography 59, pp. 321-337

⁴Petit, J. and Guillaume, P., 2008. *Climate Change and Biodiversity in the European Union Overseas Entities*. Gland, Switzerland: IUCN (International Union for Conservation of Nature) Publication Services

⁵Brown, N., 2008. *Climate change in the UK Overseas: Territories: An Overview of the Science, Policy and You*. Peterborough, UK: Joint Nature Conservation Committee.

⁶Petit, J. and Guillaume, P., 2008. *Climate Change and Biodiversity in the European Union Overseas Entities*. Gland, Switzerland: IUCN (International Union for Conservation of Nature) Publication Services

Resource Exposure



On St Helena electricity is generated through the use of diesel generators and wind turbines, with in excess of 10% of generation from wind. Diesel and petrol is imported and storage at the present is limited.⁷ According to the Public Works Department (now part of the Directorate of Infrastructure and Utilities), the saving in diesel fuel is approximately £150,000 a year.⁸ Electricity generated in 2009 was about 9 billion kWh and the main consumers were households⁹.

St Helena's water supply comes from natural springs and is collected in earth reservoirs or specially built storage tanks. The majority of the supply passes through carefully managed filtration systems before being distributed island wide for domestic, commercial and irrigation purposes via a piped network¹⁰.

Adaptation and Resilience

Importance to OT

Importance of System to OT



Natural Systems: "Critical to both the sustainability of social development and economic growth is the effective management of the environment. The environment is one of the Island's key selling points and is, therefore, a vital ingredient in the Island's tourism offering, while also an important element of health and well-being for our residents" – St Helena Sustainable Development Plan 2012/13-2014/15¹¹. Biodiversity in St Helena is characterized by a high level of endemism. There are 43 endemic plants, 400 endemic invertebrates and more than a dozen endemic coastal fish species. Of 6 endemic terrestrial bird species that existed before human habitation, only the Saint Helena Plover (wirebird) (*Charadrius sanctaehelena*), an endemic terrestrial bird, has survived until today.¹² The islands' natural heritage is the key to its future development. The new Land Development Control Plan¹³ identifies 23 National Conservation Areas and includes a suite of policies for the protection of the "Green Heartland" and other important areas in Coastal and Intermediate Zones. The diversity of the landscape is another of its outstanding features from semi desert on its coastal fringe, dry scrub on higher ground to cloud forest in the higher elevations of the Central Peaks¹⁴. Like its terrestrial flora, the waters around St Helena are noted for high levels of endemic fish and marine organisms. A resident pod of pantropical spotted dolphins can be seen daily, while bottlenose dolphins are occasional visitors and humpbacked whales are periodically observed between June and December¹⁵.

Economic Systems: Tourism, and to a lesser degree, fisheries and agriculture are key sectors of the island's economy with potential for further development and expansion.¹⁶ St Helena's economy is dependent upon British aid. A new airport is designed to facilitate a development strategy based on its tourism product which is partly described above.¹⁷

⁷ St Helena Government, 2012a. *Infrastructure*. [Online] Available at: <http://www.sainthelena.gov.sh/pages/infrastructure.html> [Accessed on 23 April 2012].

⁸ Brown, N., 2008. "Climate change in the UK Overseas: Territories: An Overview of the Science, Policy and You". Peterborough, UK: Joint Nature Conservation Committee.

⁹ St Helena Government, 2012b. *Statistics* [Online] Available at: <http://www.sainthelena.gov.sh/pages/statistics.html> [Accessed on 23 April 2012].

¹⁰ St Helena Government, 2012a. *Infrastructure*. [Online] Available at: <http://www.sainthelena.gov.sh/pages/infrastructure.html> [Accessed on 23 April 2012].

¹¹ St Helena Government (2012): "St Helena Sustainable Development Plan 2012/13-2014/15" St Helena Government

¹² Petit, J. and Guillaume, P., 2008. *Climate Change and Biodiversity in the European Union Overseas Entities*. Gland, Switzerland: IUCN (International Union for Conservation of Nature) Publication Services

¹³ St Helena Government, 2012, "LDCP 2012 – 2022 - Land Development Control Plan, Adopted Revised Version" St Helena Government, April 2012.

¹⁴ Kew Royal Botanical Gardens, 2012: "St Helena" <http://herbaria.plants.ox.ac.uk/bol/helena/> [online] [accessed 25 07 2012]

¹⁵ Entec (2009): "St Helena Wharf Improvement Project Environmental Statement 2009" produced by Entec and Nicholas O'Dwyer for SHG

¹⁶ St Helena Government, 2012. *Economy*. [Online] Available at: <http://www.sainthelena.gov.sh/pages/economy.html> [Accessed on 09 07 2012]

¹⁷ Petit, J. and Guillaume, P., 2008. *Op. cit.*

Social Systems: In 2008 the enumerated census population of St Helena was 4,077 persons excluding 180 persons who were on board the RMS St Helena and on yachts in the harbour; a decline of 1,001 persons since 1998. This decline is attributed to a falling birth rate, continued outward migration, increased contract work opportunities in the Falkland Islands and the restoration of British Citizenship¹⁸. The population is also experiencing an increase in the proportion of the elderly from 11.3% in 1998 to 17.8% in 2008. Life expectancy is 70.8 years for males and 77.3 years for females and the mortality rate is 5 deaths per 1,000 live births¹⁹. In 2009/10 per-capita GDP was \$3,875 in 2009/2010²⁰.

Vulnerability

Sensitivity to Climate Exposure



Natural Systems: Saint Helena's natural systems have been ravaged by alien invasive species, three endemic seabirds and five endemic landbirds have been lost and the native vegetation has been destroyed in most places by a combination of soil erosion caused by over-grazing by introduced herbivores, and the spread of invasive plants. Changes in climate may favour invasive flora and fauna over endemic and resident species²¹. The decrease in rainfall could have implications for local water supplies on St Helena. Variations in precipitation are also likely to accelerate erosion on the eastern side of St Helena.²²

Economic Systems: The majority of SHG Government buildings and private sector enterprise are located within the narrow confines of the James Valley. The underlying geological conditions in the valley make it particularly vulnerable to rockfall and land-slides. Most recently in August 2008, approximately 300 tonnes of rock fell in Jamestown resulting in significant damage to the Baptist Church and adjacent properties, the closure of Ladder Hill Road for several days and the evacuation of pupils from the Pilling primary school. Although there has been extensive rockfall protection works (funded by DFID)²³ the risk remains. Rainfall induced rockfall and landslides events remain a common occurrence, affecting roads and property²⁴. James town and other parts of the island also have a history of inland flooding caused by heavy rainfall events. Any potential drying trend could lead to water stress and effects on the viability of the tourism economy that the island is seeking to develop. The fishing industry may also be affected by changes in sea surface temperatures, but these potential effects are not well understood²⁵. The wharf at Jamestown and sea front at Ruperts Bay may be affected by changes to ocean swell and any potential increase in the intensity of storms.²⁶ The construction of an airport is expected to mitigate the effects of heavy sea conditions which would affect passenger disembarkation from the RMS St Helena and cruise ships²⁷.

Social Systems: Any significant rockfall event that breaches the existing protection measures will affect the resident population of the James Valley. Any potential pressure on water supply will have implications for the entire island and the viability of the population.

¹⁸ St Helena Government Statistics Office, 2009 "The 2008 Population Census of St Helena" Statistics Office, Government of St Helena

¹⁹ St Helena Government Statistics Office, 2009 "The 2008 Population Census of St Helena" Statistics Office, Government of St Helena

²⁰ FCO, 2012. *The Overseas Territories – Security, Success and Sustainability*. London: Foreign and Commonwealth Office

²¹ Petit, J. and Guillaume, P., 2008. *Climate Change and Biodiversity in the European Union Overseas Entities*. Gland, Switzerland: IUCN (International Union for Conservation of Nature) Publication Services

²² Brown, N., 2008. "Climate change in the UK Overseas: Territories: An Overview of the Science, Policy and You". Peterborough, UK: Joint Nature Conservation Committee.

²³ St Helena Government (2010): "Jamestown Rockfall Protection Environmental Assessment Phase 1 and Phase 2 EMP" – produced by WSP International for SHG

²⁴ Watt, J (2009): "Final report - Agreement N° 2009-013 / CC304 Disaster Management Support for the Government and Authorities of Saint Helena February – May 2009" St Helena Government 2009

²⁵ Brown, N., 2008. "Climate change in the UK Overseas: Territories: An Overview of the Science, Policy and You". Peterborough, UK: Joint Nature Conservation Committee.

²⁶ Petit, J. and Guillaume, P., 2008. *Climate Change and Biodiversity in the European Union Overseas Entities*. Gland, Switzerland: IUCN (International Union for Conservation of Nature) Publication Services

²⁷ Faber Maunsell/Aecom (2008): "St Helena Airport and Supporting Infrastructure Environmental Statement: Volume 6 Socioeconomic Impact Assessment" – published on behalf of SHG, by Faber Maunsell/Aecom [online] at http://www.sainthelenaaccess.com/application/documents/Environmental-Statement/Volume_6_Socioeconomic_Report/ES_Vol%206_Socioeconomic%20Report_v2.pdf [accessed 25 07 2012]

Current Resilience Activities

Resilience activities in St Helena comprise a range of recent and on-going infrastructure interventions based around the action plan and prioritised projects outlined within the St Helena Infrastructure Plan²⁸ and on a wide range of conservation based initiatives which can be seen as part of a wider ecosystems-based approach to adaptation.

On infrastructure: Water projects W1 (design and support to sustainable water resources management) and W2/3 (water meeting immediate needs) are increasing the institutional management capability, reducing water loss and improving the physical distribution of water between catchments²⁹; similar projects are being instigated in roads which will reduce the susceptibility of the road network to weather effects through improved maintenance. In social services the hospital is being upgraded^{30,31}. An on-going scheme entitled the Wharf Improvement Project funded by the EU under EDF9 and EDF10 commenced in 2009 with a cliff stabilisation project to mitigate rockfall into the wharf area. Further works have included widening and strengthening of sections of the wharf, including the use of rock armouring.³²

Not in the plan, but with major implications for St Helena, in 2010 DFID funded the first phase of rockfall protection works – a programme of rock catch fences and nets on the eastern and western slopes of the James Valley^{33,34}

On conservation, the new Land Development Control Plan identifies 23 areas to be included in a national network of protected areas while strict planning policies are in place governing development in the “Green Heartland”. DFID, the FCO and DEFRA have all been heavily involved in conservation programmes, generally working closely through the national trust. Examples of recent initiatives include *Laying the Foundations for Invertebrate Conservation on St Helena* and *Mapping St Helena’s Marine Biodiversity to create a Marine Management Plan* (both under the Darwin initiative) and the *Bastard Gumwood Recovery Project* and *Invasive Species Project* partially funded by DEFRA and coordinated by JNCC.^{35 36}

Work continues on the Millennium Forest – a community participation project for the re-creation of the former great Wood lowland gumwood forest. The implementation of a restoration management plan for Diana’s Peak National park is also ongoing, enhancing and restoring this area of native cloud forest³⁷

St Helena also hosts two Important Bird Areas (IBAs) and three sites have been proposed to be designated as Ramsar sites.³⁸

Activities in the field of energy supply and use are reported in *Current Abatement Activities*.

Exacerbating Stresses

It is anticipated that a new airport and supporting policy and programme framework will overcome key stresses which relate to its isolation.

St Helena’s greatest challenge is rebuilding its skill base following massive depopulation in the 1990s. SHG still relies heavily on technical assistance³⁹. The remoteness of the island affects both population levels and the ability of HMG to respond to the effects of any natural disaster.

²⁸ SHG and DFID (2008) “Infrastructure Plan” produced by the DFID Resource Centre TI-UP 2008

²⁹ SHG and DFID (2008) “Infrastructure Plan” produced by the DFID Resource Centre TI-UP 2008

³⁰ *ibid*

³¹ SHG Directorate of Infrastructure and Utilities (2012): “Terms of Reference for the provision of Project Management Support Contractor” – issued by DIU July 2012

³² Entec (2009): “St Helena Wharf Improvement Project Environmental Statement 2009” produced by Entec and Nicholas O’Dwyer for SHG

³³ HPR (formally High Point Rendell) (2009): “Jamestown Rockfall Protection, Jamestown – Evaluation Report”, May 2009 and SHG (2010):

³⁴ St Helena Government (2010): “Jamestown Rockfall Protection Environmental Assessment Phase 1 and Phase 2 EMP” – produced by WSP International for SHG

³⁵ DEFRA, 2012. “New Darwin project”s. [Online] Available at: <http://jncc.defra.gov.uk/page-4403> [Accessed on 23 April 2012].

³⁶ JNCC, 2012. *St Helena*. [Online] Available at: http://www.nationaltrust.org.sh/darwin_initiative.html [Accessed on 23 April 2012].

³⁷ Saint Helena National Trust, 2012. *St Helena’s Darwin Initiative Project*. [Online] Available at:

http://www.nationaltrust.org.sh/darwin_initiative.html [Accessed on 23 April 2012].

³⁸ Rayment, M, 2007. *Costing Biodiversity Priorities in the UK Overseas Territories*, GHK, London

³⁹ SHG and DFID (2008) “Infrastructure Plan” produced by the DFID Resource Centre TI-UP 2008

Challenges exist for biodiversity conservation on the island, including the introduction of invasive non-native species and illegal fishing.⁴⁰

A potential rapid increase in population (resident and tourist) arising from airport development may exacerbate land use pressure and pressure on scarce water and energy resources.

Future Opportunities

Potential Adaptation Interventions

In infrastructure the St Helena Infrastructure Plan contains a number of potential project interventions in Water and Roads to improve the management of these assets⁴¹.

The *Strategic Plan for the Environmental Management Department 2012-15* includes the development of management plans for all the NCA identified in the LDCPs and to start implementing 3 of them in priority areas. A range of opportunities exist within this framework to implement species conservation and management of invasive species. For example, the St Helena National Trust has also recently been awarded with nearly £300,000 from the Darwin Initiative for a three year programme to 'Increase local capacity to conserve St Helena's threatened native biodiversity', and more specifically to halt biodiversity loss in the species-rich High Peak and Blue Point areas on St Helena, through increasing local awareness to deliver practical habitat restoration and management. The development of eco-tourism activities is also part of the project.⁴²

The Strategic Plan also commits to the implementation of a project on solid waste management.⁴³

Implementation Capacity

The St Helena Government launched an Environmental Management Directorate on 16 April 2012. Its focus will be to mainstream environment and climate change within St Helena Government.⁴⁴ In April 2012 the Department was advertising for an Environmental Risk Manager and a Climate Change and Pollution Officer to develop its resilience capacity. Other government directorates, notably the Infrastructure and Utilities Directorate are overcoming problems relating to local recruitment with DFID sponsored TA. Historic problems of recruiting through this mechanism may be overcome by the advent of air access.

The St Helena National Trust is responsible for the protection, enhancement and promotion of St Helena's unique environmental and cultural heritage. It has recently been awarded with nearly £300,000 from the Darwin Initiative for a three year programme to 'Increase local capacity to conserve St Helena's threatened native biodiversity'.⁴⁵ The Trust is, however, heavily dependent on the commitment and passion of a small number of resident

⁴⁰ Petit, J. and Guillaume, P., 2008. *Climate Change and Biodiversity in the European Union Overseas Entities*. Gland, Switzerland: IUCN (International Union for Conservation of Nature) Publication Services

⁴¹ SHG and DFID (2008) "*Infrastructure Plan*" produced by the DFID Resource Centre TI-UP 2008

⁴² Saint Helena National Trust, 2012. *St Helena's Darwin Initiative Project*. [Online] Available at: http://www.nationaltrust.org.sh/darwin_initiative.html [Accessed on 23 April 2012].

⁴³ Government of St Helena, 2011. *Strategic Plan (Part A) for the Environmental Management Department 2012-15*. [Online] Available at: http://www.sainthelena.gov.sh/data/files/emd_strategic_plan_20122015_final_04_04_12.pdf [Accessed on 23 April 2012].

⁴⁴ St Helena Government, 2012c. *Environment* [Online] Available at: <http://www.sainthelena.gov.sh/pages/environment.html> [Accessed on 23 April 2012].

⁴⁵ Saint Helena National Trust, 2012. *St Helena's Darwin Initiative Project*. [Online] Available at: http://www.nationaltrust.org.sh/darwin_initiative.html [Accessed on 23 April 2012].

Low Carbon Development (Source)

Current Emissions

Share of Current Emissions



St Helena is not covered by UK GHG Inventory. Estimates suggest that St Helena was responsible for the production of 11,000 metric tonnes CO₂ in 2008.⁴⁶

GHG Abatement

Abatement Potential



The St Helena Government is committed to investing in the use of more renewable energy and promoting energy conservation.

St Helena has an excellent wind energy resource, with high average windspeeds, but low extreme gust speeds. Despite some operational problems the existing Lagerwey wind turbines on Deadwood Plain have demonstrated the value of this resource. St Helena has already achieved very high levels of wind power contribution to power demand in comparison with mainland utilities. Wind power technology is well-established world-wide, and the Energy Division of the Infrastructure and Utilities Directorate has already gained experience of operating wind turbines. For these reasons, wind power is considered to be a suitable renewable technology for further application on St Helena⁴⁷. The primary difficulty in expanding the island's wind generation capacity lies in finding suitable sites on the island. The island's complex geography means that many sites around the island may not be suitable for wind generation, due to difficulties of access for installation and maintenance, and also due to the turbulence generated within the approaching airflow by the terrain. The number of sites available for wind generation may be further limited by existing development, the proposed airport, and by environmental considerations⁴⁸.

Although, solar water heaters are common, the full potential of this resource is unknown.

Current Abatement Activities



In St Helena Electricity is generated through the use of diesel generators and wind turbines, with in excess of 10% of generation from wind.⁴⁹ Three wind turbines contributed up to 240 kW to the total demand for electricity. The saving in diesel fuel is approximately £150,000 a year.⁵⁰ The Power System in St Helena is currently being upgraded with DFID funding to include the potential to integrate further renewables. The 2009 *St Helena Infrastructure Plan*⁵¹ included a number of potential projects, including additional wind generating capacity. In the long term this may include energy storage.

Moreover, the Government of St Helena has recently supplied households with free energy saving bulbs. Solar powered street lighting has recently started to be implemented and solar water heaters are becoming more common.⁵²

⁴⁶ United Nations Statistic Division, 2012. *Millennium Development Goals*. [Online] Available at <http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crid=> [Accessed 19 04 2012].

⁴⁷ DFID TI-UP (2010) "Environmental Screening Note for additional wind turbines on St Helena" produced by and submitted by the Department of Energy, Infrastructure and Utilities Directorate, 2010

⁴⁸ *ibid*

⁴⁹ St Helena Government, 2012a. *Infrastructure*. [Online] Available at: <http://www.sainthelena.gov.sh/pages/infrastructure.html> [Accessed on 23 April 2012].

⁵⁰ Brown, N., 2008. "Climate change in the UK Overseas: Territories: An Overview of the Science, Policy and You". Peterborough, UK: Joint Nature Conservation Committee.

⁵¹ SHG and DFID (2008) "Infrastructure Plan" produced by the DFID Resource Centre TI-UP 2008

⁵² St Helena Government, 2012a. *Infrastructure*. [Online] Available at: <http://www.sainthelena.gov.sh/pages/infrastructure.html> [Accessed on 23 April 2012].

Future Opportunities

Potential LCD Intervention

SHG has been actively investigating alternative potential energy sources. This includes most recently a study investigating the potential for hydropower.⁵³ In the short and medium term, potential interventions are likely to be restricted to further wind energy and use of solar energy for hot water.

Activities planned in the fields of tourism, waste management, land use and forestry have already been reported in 'Potential Adaptation Interventions.'

Implementation Capacity

The production and distribution of electricity falls under the auspices of the Directorate of Infrastructure and Utilities (formally Public Works and Services Department).⁵⁴

NAO (2007) reported that there were difficulties in attracting suitably qualified applicants for senior permanent posts in these Territories.⁵⁵ It is anticipated that the advent of air access will mitigate this issue.

UK Exposure

UK Sunk Assets

DFID initiated a major project for the construction of an airport in 2011, which will be operational towards the end of 2015. The UK is providing up to £246.6 million to build this airport.⁵⁶ Economically, St Helena is still dependent upon British aid.

Absolute Value of UK Transfer

Economically, St Helena is dependent upon British aid. DFID averaged £23.5 million a year over three years from 2009/2010 to 2011/2012 to support St Helena.⁵⁷ A small percentage of the Technical Cooperation Budget was spent on providing technical assistance to Tristan da Cunha.⁵⁸

Share of National Budget from UK Transfer

More than 50% of the budget is provided by the UK Government.⁵⁹

Potential Liability

St Helena is an ODA eligible country and the UK is responsible for picking up the end costs of any natural disaster/extreme weather event. Moreover, UK HMG has an on-going responsibility for the support of essential government services.

St Helena is among the signatories of the following multilateral environmental agreements⁶⁰:

⁵³ Itp, 2011. *St Helena Micro-Hydro Power*. Ppt presentation, personal communication.

⁵⁴ St Helena Government, 2012a. *Infrastructure*. [Online] Available at: <http://www.sainthelena.gov.sh/pages/infrastructure.html> [Accessed on 23 April 2012].

⁵⁵ National Audit Office, 2007. *Op cit*.

⁵⁶ FCO, 2012. *The Overseas Territories – Security, Success and Sustainability*. London: Foreign and Commonwealth Office

⁵⁷ *ibid*

⁵⁸ St Helena Government, 2012b. *Statistics* [Online] Available at: <http://www.sainthelena.gov.sh/pages/statistics.html> [Accessed on 23 April 2012].

⁵⁹ FCO, 2012. *The Overseas Territories – Security, Success and Sustainability*. London: Foreign and Commonwealth Office

⁶⁰ DEFRA, 2012. *The Environment in the United Kingdom's Overseas Territories: UK Government and Civil Society Support*. London, UK: DEFRA

- Convention on Biological Diversity (CBD)
- Convention on the Conservation of Migratory Species of Wild Animals (CMS)
- African-Eurasian Migratory Waterbird Agreement (AEWA)
- Agreement on the Conservation of Albatrosses and Petrels (ACAP)
- 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
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Reputational Risks



DFID funded evidence suggests that the island has been suffering economic and social decline, with increasing levels of outwards migration and the average annual salary decreasing to just £4,000.⁶¹ St Helena is still dependent on UK aid⁶².

⁶¹ DFID Overseas Territories Department, 2011. *Operational Plan 2011-2015*. [Online] Available at: <http://www.dfid.gov.uk/Documents/publications1/op/ovseas-terr-dept-2011.pdf> [Accessed on 22 March 2012].

⁶² Note that air access and the memorandum of understanding signed between HMG and SHG as part of that process is designed to reverse the outward migratory trend and place St Helena on the path to sustainable development.

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 Intergovernmental 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: St Helena - 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	X

Low Carbon Electricity Resource Potential	Share of Current Electricity Production	Potential
1 Wind	10%	High
2 Hydro	X	Medium
3 Solar PV	X	Medium
4 Geothermal	X	X
5 Biomass	X	X
6 Waste (solid, liquid)	X	X
Low Carbon Heat Potential	% of buildings	Potential
1 Solar Thermal	Low	Medium
2 Biomass	X	X
Liquid Fuels	% of consumption	Potential
1 Bioethanol	X	X
2 Bio diesel	X	X

St Helena

Summary
GENERAL INFORMATION The island of St Helena forms a single grouping with Tristan da Cunha and Ascension Island under the Crown. Located in the South Atlantic Ocean, St Helena covers 122 km ² . Total population around 4,000 people. Main economic activities include tourism, fisheries and agriculture. Major plans to scale up limited touristic activities on St Helena with ongoing construction of airport.
Threat Exposure Analysis Experienced events: air temperatures have increased by 0.9°C in last 100 years; decrease of monthly rainfall (10mm/ 100 years); decreased air pressure (0.6hPa/ 100 years). Expected events: air temperatures to increase by 2°C in the next 60 years; rainfall to decrease; sea surface temperatures and sea level to increase. Electricity produced through diesel generators and wind turbines. Water supply from local natural springs in St Helena.
Adaptation and Resilience Systems: Presence of endemic species of flora and fauna. Tourism, fisheries and agriculture key sectors of economy with potential for expansion. Per-capita GDP of \$3,875 and life expectancy of 77.3 years (women). Predicted effects: spread of invasive species accelerated by warmer temperatures. Decreased rainfall to affect groundwater sources. Variations in precipitation likely to accelerate erosion. Likely decrease in fishery; tourism affected by worsened weather pattern. Activities: Projects for the protection of biodiversity ongoing, funded by DFID, FCO and DEFRA. Millennium Forest St Helena (forest restoration project) winner of International Conservation Award. Willingness to develop ecotourism. Presence of two IBAs. 23 NCAs proposed and management plans foreseen. St Helena National Trust awarded with 3300,000 from the Darwin Initiative for the conservation of native biodiversity. Capacity: Environment management Directorate launched in April 2012. Difficulties in attracting suitably qualified staff.
Low Carbon Development CO2 emissions: 11,000 metric tonnes in 2008. Three wind turbines supplying 10% of electricity.
UK Exposure St Helena dependent upon budgetary aid from UK. UK still responsible for essential government services. Major project for building an airport. £23.5 million (more than 50% of St Helena budget) a year allocated for three years from 2009/2010 to 2011/2012. St Helena signatory of several multilateral environmental. Economic and social decline, with increasing emigration.
Exacerbating Risks Volcanic origin: Introduction of invasive non-native species; Illegal fishing; Erosion

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

UK Exposure (2012)				
UK Sunk Assets	Absolute Value of UK Transfer	Share of National Budget from UK Transfer	Potential Liability	Reputational Risks
X	Red	Red	X	Orange
X	Red	Red		Orange
X	Red	Red		Orange
X	Red	Red	X	Orange
X	Red	Red	X	Orange
X	Red	Red		Orange
X	Red	Red		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		X	Green	Green	Green	Orange
Transport		X	Orange	Red	Red	Red
Public		X	Orange	Green	Red	Red
Business		X	Orange	Orange	Red	Red
Residential		X	Orange	Orange	Red	Red
Agriculture		X	Orange	Red	Red	Red
Waste management		X	Green	Green	Red	Red
Land Use, Land Use Change and Forestry		X	Green	Orange	Green	Red

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