



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

Needs Assessment:  
Turks and Caicos 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 (29<sup>th</sup> March 2012) and End of Contract Report (11<sup>th</sup> 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.

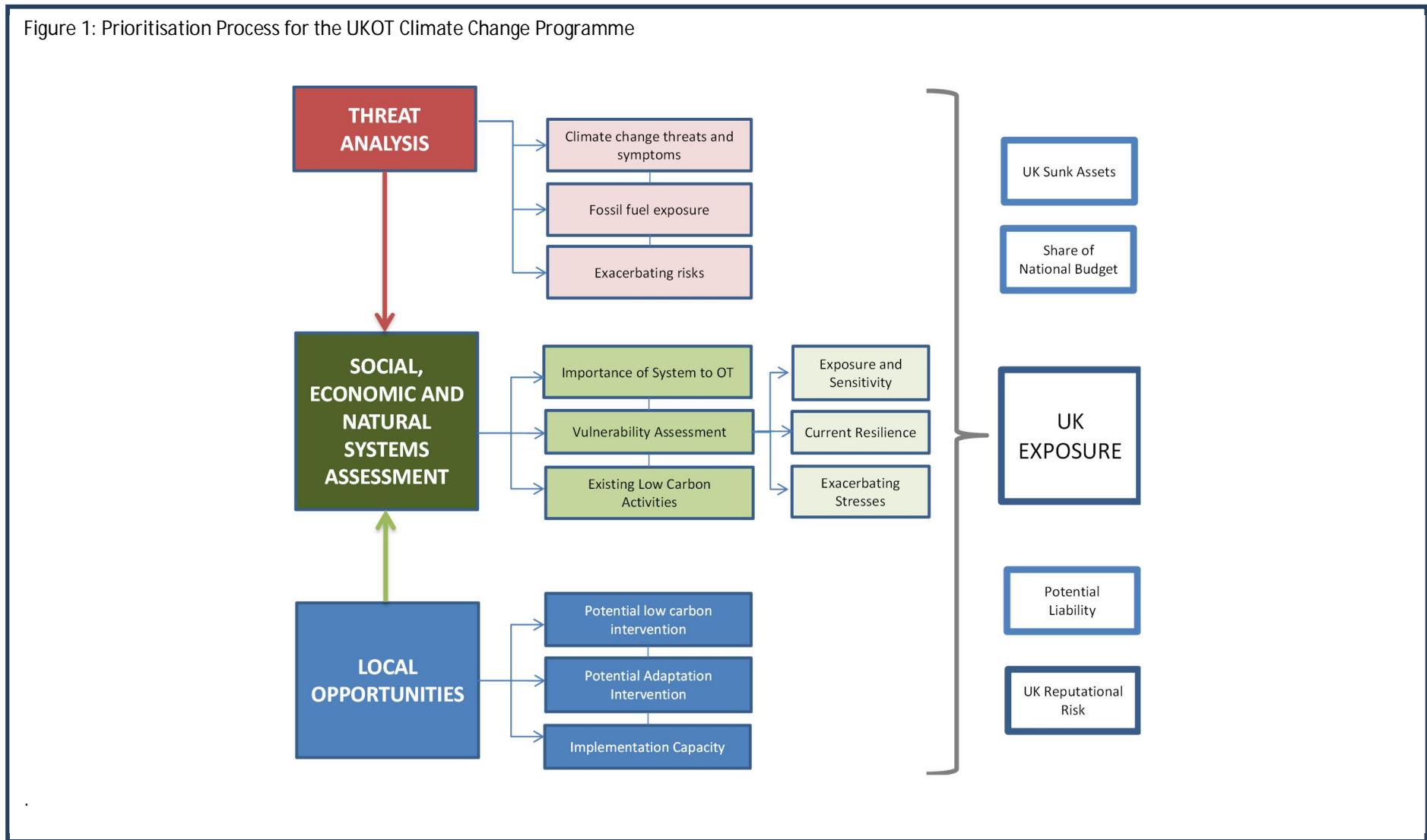
The completed VAM in this report uses a RAG colour coding system to provide a comparative analysis across all of the OTs to feed into the overall programme design. In most cases, data has been included specifically for the later appraisal and business case design process which would have followed.

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: Turks and Caicos Islands



KEY INDICATORS	
Population:	34,238 (2010est <sup>1</sup> )
GDP (\$):	604,221 million (2010 <sup>2</sup> )
Per Capita GDP (\$):	26,280 (2008)
ODA Entitled:	No
UK Annual Budget Support:	More than £13 million in 2010-2011
Value of UK Sunk Assets:	N.A.
Key Economic Sectors:	Tourism, financial services and fishing

### Threat Exposure Analysis

#### Climate Change Exposure

The Turks and Caicos Islands are situated in the south of the Bahamian archipelago, sitting 90 miles north of Hispaniola (Haiti and Dominican Republic), 30 miles southeast of The Bahamas, and 575 miles southeast of mainland USA (Miami).<sup>3</sup>

The TCI consists of 40 islands and cays in two distinct groups (the Turks and the Caicos), which extend for 75 miles east to west and 50 miles north to south. There are eight major islands, namely Salt Cay, Grand Turk, South Caicos, East Caicos, Middle Caicos, North Caicos, Providenciales and West Caicos. Within this group of islands and cays, six of the larger islands are inhabited by the majority of the national population, while three of the smaller cays, Parrot Cay, Pine Cay and Ambergris Cay carry smaller populations. Among the cays, four are privately owned (Pine Cay, Parrot Cay, Cotton Cay and Ambergris Cay)<sup>4</sup>.

The climate of the TCI is tropical with a distinct wet and dry season. The geographical distribution of the islands results in a high variability of rainfall patterns where drought may be experienced in individual islands independent of others<sup>5</sup>. Annual precipitation varies from 53.3 cm in the Turks Islands and 100cm in the Caicos Islands where there is more vegetative cover. Rainfall, in heavy brief showers, is usually heaviest during the period May to October. Evaporation rates exceed annual rainfall, with a yearly average of 165 cm<sup>6</sup>.

Temperatures average 27°C in the 'summer' months and 21°C in 'winter' months. Maximum and minimum temperatures seldom exceed 32°C or 16°C respectively. During the 'summer' months, the trade winds blow

<sup>1</sup> Department of Economic Planning and Statistics, 2012, published on government website <http://www.depstc.org/census2012.html>

<sup>2</sup> ibid

<sup>3</sup> Kairi Consultants Ltd, 2006: "National Socio-economic Development Planning Framework for the Turks and Caicos Islands (2006-2015) Annex V Environmental Situational Analysis Report" Submitted to the Department of Economic Planning and Statistics, Ministry of Finance, Health and National Insurance, Grand Turk, TCI.

<sup>4</sup> ibid

<sup>5</sup> ECLAC. (2008): "Turks and Caicos Islands: Macro Socio-economic Assessment of the Damage and Losses Caused by Tropical Storm Hanna and Hurricane Ike. Port-of-Spain, Trinidad and Tobago: Economic Commission for Latin America and the Caribbean cited in Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Ruddy, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies.

<sup>6</sup> Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Ruddy, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies.

from the east or southeast, whereas during the winter months the winds change direction and blow from the west or northwest<sup>7</sup>.

The hurricane season extends from June to November and like the rest of the Caribbean, the TCI is vulnerable to tropical storms, hurricanes and storm surges. Hurricanes occur on average once per 5.5 years but only occasionally have destructive impacts.

Recent work by the Caribsav Partnership<sup>8</sup> provides detailed predicative climatic data for the TCI based on downscaled regional climate model (RCM) and general circulation model (GCM) projections.

On temperature, RCM projections indicate an increase spanning 2.3°C to 2.9°C by the 2080s in a higher emissions scenario. This is consistent with historic trends; since the 1950s, mean temperatures in the Caribbean have risen around 2°C, with the number of very warm days in the region increasing but the number of very cold nights decreasing<sup>9</sup>.

GCM projections for annual rainfall vary significantly with decreases and increases ranging from -29 to +8 mm per month by the 2080s across three emissions scenarios. Most projections tend toward decreases, but with a changing pattern of rainfall that sees fewer but more intense rainfall events<sup>10</sup>. There are fears of an increase in the propensity and severity of risk of drought conditions on the TCI.<sup>11</sup>

Sea Surface Temperatures (SST) in region are already rising and this trend is forecast to continue. Over the past two decades warming has been recorded at between 0.2°C and 0.5°C per decade<sup>12</sup>. GCM projections indicate increases in SST throughout the year from +0.9°C and +2.7°C by the 2080s across all three emissions scenarios.

These observed and projected increases in SSTs indicate the potential for continuing increases in hurricane activity. Although there is some uncertainty, it is predicted that the TCI will be affected by an increase in the intensity of hurricanes (greater likelihood of category 4 and 5 hurricanes) and tropical storms, though not necessarily any increase in frequency<sup>13</sup>.

## Resource Exposure

Electricity is provided by diesel-powered generators managed by two companies, with a total capacity of 65MW. Diesel fuel (lighter diesel No 2) is imported. The power generation cost in TCI was \$0.20 per kWh in 2008.

With an average rainfall of only 66cm annually and evaporation rates often higher than rainfall, the TCI is water scarce. It is mandatory by law that residents establish household cistern/ tank systems for collecting rainwater. In general the fresh ground water lens is thin, sitting on a saline bed. Desalination plants are in operation on all the main inhabited islands<sup>14</sup> where reverse Osmosis technology is used for providing potable water from seawater through seven operating units. Two of them use Variable-Frequency Drives (VFDs) and energy

<sup>7</sup> Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Ruddy, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies.

<sup>8</sup> ibid

<sup>9</sup> Brown, N., 2008. *Climate change in the UK Overseas: Territories: An Overview of the Science, Policy and You*. Peterborough, UK: Joint Nature Conservation Committee.

<sup>10</sup> Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Ruddy, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies.

<sup>11</sup> Climate Change Committee, 2011. *Turks and Caicos Islands Climate Change Green Paper*. Belmopan, Belize: Caribbean Community Climate Change Centre.

<sup>12</sup> Simpson, M.C., Scott, D., Harrison, M., Silver, N., O'Keeffe, E, Harrison, S., Taylor, M., Sim, R., Lizcano, G., Wilson, M., Ruddy, M., Stager, H., Oldham, J., New, M., Clarke, J., Day, O.J., Fields, N., Georges, J., Waithe, R., McSharry, P.(2010): Quantification and Magnitude of Losses and Damages Resulting from the Impacts of Climate Change: Modelling the Transformational Impacts and Costs of Sea Level Rise in the Caribbean, United Nations Development Programme (UNDP), Barbados, West Indies.

<sup>13</sup> ibid.

<sup>14</sup> Kairi Consultants Ltd, 2006: "National Socio-economic Development Planning Framework for the Turks and Caicos Islands (2006-2015) Annex V Environmental Situational Analysis Report" Submitted to the Department of Economic Planning and Statistics, Ministry of Finance, Health and National Insurance, Grand Turk, TCI.



recovery devices. Tariffs (\$0.03 per gallon for connected customers) are roughly equal to production costs only.<sup>15</sup>

## Adaptation and Resilience

### Importance to OT

#### Importance of System to OT



The TCI economy relies primarily on tourism and fisheries. These sectors, and others, are dependent on the state of the natural environment, so climate change impacts will adversely affect the livelihoods based on these sectors<sup>16</sup>.

#### Natural Systems:

*Terrestrial:* The islands have highly important natural systems and have recently featured on the UK Tentative List for World Heritage Site nominations. In June 1990, a Ramsar site encompassing parts of North, Middle and East Caicos was designated.<sup>17</sup> Another 33 sites are currently protected under the Turks and Caicos Islands National Park Ordinance. They fall into four categories: national park, nature reserve, sanctuary and area of historic interest.<sup>18</sup> Since 1995, nearly one third of the TCI has been set aside for protection. There are 11 national parks, 12 nature reserves, four sanctuaries and seven historical sites. The TCI's protected areas cover 167% of the country's surface area, making it third in the world, behind Palau (293%) and Greenland (288%) and followed by Tuvalu (110%) and Cayman Islands (93%).

The TCIs remaining terrestrial systems are dominated by tropical dwarf dry forest. This slow growing forest is one of the rarest forest types in the world supporting a range of endemic flora. Of other natural terrestrial systems, it is estimated that over half the total land area of the TCI is covered by wetland systems. The wetland complex found on East Caicos, Middle Caicos and North Caicos is reported to be perhaps the best example of a wetland of its kind in the Caribbean<sup>19</sup>.

*Coastal and Marine:* The TCI has approximately 242 miles of coastline and a marine area ten times its land area. It is characterised by diverse ecosystems including wetlands, seagrass meadows, reefs, beaches and bays. These habitats host an extensive range of fishes, important migratory birds, marine mammals, three protected species of sea turtles and other animal species. As well as providing habitat and maintaining marine and coastal biodiversity, the coast and marine resources in and around the TCI form the basis of the tourism sector and the fisheries industry and play important roles in maintaining water quality and protecting the coastal zone from erosion and storm surge<sup>20</sup>.

Of particular note across systems, the TCI host three plants, one reptile, two bats, three turtles and one bird species of global conservation concern; eight endemic plants and four endemic reptile species and regionally important populations of seabirds.

<sup>15</sup> Castalia, 2011. *Development of an Energy Conservation Policy and Implementation Strategy for the Turks and Caicos Islands – Draft Final Report*. Turks and Caicos Islands: Government of the Turks and Caicos Islands

<sup>16</sup> Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Ruddy, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies.

<sup>17</sup> Oldfield, S., (1999). " Biodiversity in the UK Overseas Territories" JNCC

<sup>18</sup> Department of Environment and Coastal Resources, 2012a. *Protected Area Division*. [Online] Available at: <http://www.environment.tc/Protected-Areas-Division.html> [Accessed on 10 April 2012]

<sup>19</sup> Kairi Consultants Ltd, 2006: "National Socio-economic Development Planning Framework for the Turks and Caicos Islands (2006-2015) Annex V Environmental Situational Analysis Report" Submitted to the Department of Economic Planning and Statistics, Ministry of Finance, Health and National Insurance, Grand Turk, TCI.

<sup>20</sup> *ibid*



**Water resources:** The TCI are water scarce, with very limited natural freshwater resources<sup>21</sup> Potable water is typically sourced from reverse osmosis desalination of brackish, underground water on the populated islands of Providenciales, and Salt Cay; while on the less populated islands, many homes have sizeable cisterns to store water (which have been required by law), and these may be replenished either from rainwater or via truck-borne water supplies. Non-potable water resources including sea water and brackish groundwater are also utilised for flushing toilets<sup>2223</sup> Groundwater is not used for a fresh water supply in Grand Turk. Previous studies discarded the possibility of this source in Grand Turk and other islands off the Caicos<sup>24</sup>.

**Economic Systems:** Tourism is the main economic activity in TCI supporting around 50% of all employment and contributing to over 34% of GDP in 2009 (the contribution of hotels and restaurants to GDP)<sup>25</sup>. Since 2005 the TCI have become a major cruise ship destination; arrivals have increased dramatically from 20,000 in 2006 to 532,245 in 2007<sup>26</sup>. Financial services are also important accounting for 13.12% of GDP, with real estate and transport both contributing around 10% (9.9% and 9.56% respectively)<sup>27</sup>. Fishing holds a special place in the TCI economy – not in GDP terms (less than 1% with agriculture) in 2009, but in socio-economic terms. Fishing is particularly important in South Caicos. The TCI are heavily dependent on imports for both consumption and production. Trade is mostly with the United States of America. According to the Department of Economic Planning and Statistics (DEPS), total imports were valued at US\$ 591.3 million, while merchandise imports were valued at US\$ 359.3 million or 60.8% of total imports into the TCI in 2008<sup>28</sup>.

**Social Systems:** The population in the TCI had a per-capita GDP of \$26,280 in 2008<sup>29</sup>, a life expectancy of 79.26 years and a mortality rate of 3 deaths per 1,000 people (2012 est.)<sup>30</sup> The distribution of population is not equal. Between 1980 and 1990, Providenciales experienced a massive increase in population, and became the largest population centre, displacing Grand Turk (in 2006 73% of total population). This growth is a result of both internal migration and more significantly immigration from outside the country. In 2001, Haitians made up 25% of the total population of Turks and Caicos. Population continue to migrate to Providenciales from smaller less developed islands.<sup>31</sup>

## Vulnerability

### Sensitivity to Climate Exposure

**Natural Systems:** The reef and marine systems that underpin the TCI's tourism product are most vulnerable to the potential effects of climate change. These potential effects include the bleaching of coral and slower coral growth as a consequence of warmer sea temperatures. Sea level rise and storm surge events threaten beaches

<sup>21</sup> Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Ruddy, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies

<sup>22</sup> Castalia, 2011. *Development of and Energy Conservation Policy and Implementation Strategy for the Turks and Caicos Islands – Draft Final Report*. Turks and Caicos Islands: Government of the Turks and Caicos Islands

<sup>23</sup> Simpson, M. C et al., (2012) op cite

<sup>24</sup> ECLAC (2011): "An Assessment of the Economic Impact of Climate Change on the Water Sector in the Turks and Caicos Islands" ECLAC Caribbean Sub-regional Headquarters

<sup>25</sup> Department of Economic Planning and Statistics (2010): "TCI Percentage Contribution of GDP by Economic Activity in Current Prices" DEPS [online] accessed on 23 07 2012 at <http://www.depstc.org/stat/economic/nationalaccts.html>

<sup>26</sup> The Department of Economic, Planning and Statistics (DEPS), (February 2011) cited in ECLAC (2011): "An Assessment of the Economic Impact of Climate Change on the Water Sector in the Turks and Caicos Islands" ECLAC Caribbean Sub-regional Headquarters

<sup>27</sup> Department of Economic Planning and Statistics (2010): "TCI Percentage Contribution of GDP by Economic Activity in Current Prices" DEPS [online] accessed on 23 07 2012 at <http://www.depstc.org/stat/economic/nationalaccts.html>

<sup>28</sup> The Department of Economic, Planning and Statistics (DEPS), (2008) cited in ECLAC (2011): "An Assessment of the Economic Impact of Climate Change on the Water Sector in the Turks and Caicos Islands" ECLAC Caribbean Sub-regional Headquarters

<sup>29</sup> Commonwealth Secretariat, 2012. *United Kingdom – Turks and Caicos Islands*. [Online] Available at: <http://www.thecommonwealth.org/Templates/YearbookInternal.asp?NodeID=140431> [Accessed on 10 April 2012].

<sup>30</sup> CIA, 2012. *The World Factbook*. [Online] Available at: <https://www.cia.gov/library/publications/the-world-factbook/geos/tk.html> [Accessed on 12 April 2012].

<sup>31</sup> Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Ruddy, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies

and mangrove systems. Water resources are already under major stress and higher temperatures are likely to increase the demand for desalination for human consumption, with mortality events in natural systems as flora and fauna populations struggle to adapt. Changing rainfall patterns are expected to result in loss of some plant/animal species and habitats. The loss of native vegetation as a result of rising salinity is also anticipated.<sup>32</sup>

**Economic Systems:** The TCI are low lying and key economic infrastructure, largely located in coastal areas is likely to be at increased risk of the effects of storm surge, tropical storms and the effects of sea level rise which will exacerbate existing processes as well as inundating areas of coast. At a 0.5 m sea level rise (SLR) scenario, more than half of the beach area will be lost in Grand Turk West Shore (53%) and Historic Cockburn Town (65%). All (100%) of the beach area will be lost in Historic Cockburn Town under a 2m SLR scenario, with all (100%) of the beach area in Grand Turk Cruise Centre and Grand Turk West Shore under a 3m SLR scenario. Beach retreat and erosion poses a significant threat – under a scenario with projected 50m erosion, 95% of the resorts in the Turks and Caicos Islands would be at risk, with all (100%) at risk with 100 m of erosion<sup>33</sup>. Changes to the natural environment and impacts on the tourism “product” could result in a less marketable travel destination (e.g. degradation of coral reef ecosystems) with an associated reduction in visitor arrivals, loss of foreign exchange for TCI and adverse impacts on social sectors supporting the tourism industry. Although small sectors, changes in fish production and movements of fish stocks away from normal breeding areas could affect the fishing industry, while rising temperatures and changing rainfall patterns, as well as more severe and frequent droughts, could affect agricultural yields.<sup>34</sup>

**Social Systems:** There are two major sensitivities. Firstly, the majority of settlements are on the coast and are already being affected by storm surge and erosional processes. Secondly, many livelihoods are connected to tourism<sup>35</sup>. A combination of degradation of the marine environment and damage to coastal infrastructure (both from long term sea level rise, and the more immediate threat from tropical storm related effects such as inland flooding) could have a major impact on income and livelihoods.<sup>36</sup>

As with all low lying areas, standing water following flood events has the potential to induce a range of potential health related threats.<sup>37</sup>

## Current Resilience Activities



The TCI have been active participant in the DFID ECACC process. A Climate Change Committee was established in 2010 and in 2011 a background Green Paper has been produced. The Green Paper signposts the development of a *National Climate Change Adaptation Strategy and Action Plan* and a *Climate Change Public Education and Outreach Strategy*.<sup>38</sup> Other island states working within this framework have produced draft policies; there is no evidence of such a policy yet for the TCI and no clarity in where the TCI are in that process.

A 2012 Climate Change Risk Profile for the Turks and Caicos Islands prepared by The CARIBSAVE Partnership with funding from UKaid from the Department for International Development (DFID) and the Australian Agency for International Development (AusAID) March 2012 provides an additional resource for resilience planning on the TCI.

In water: many homes have sizeable cisterns to store water (required by law), and these may be replenished either from rainwater or, via truck-borne water supplies. Non-potable water resources including sea water and

<sup>32</sup> Climate Change Committee, 2011. *Turks and Caicos Islands Climate Change Green Paper*. Belmopan, Belize: Caribbean Community Climate Change Centre

<sup>33</sup> Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Ruddy, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies

<sup>34</sup> Climate Change Committee, 2011. *Op cit*.

<sup>35</sup> Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Ruddy, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies

<sup>36</sup> *ibid*

<sup>37</sup> Climate Change Committee, 2011. *Turks and Caicos Islands Climate Change Green Paper*. Belmopan, Belize: Caribbean Community Climate Change Centre

<sup>38</sup> *ibid*

brackish groundwater are also utilised for flushing toilets.<sup>39</sup> At the macro level a US \$23.6M investment in water and wastewater is planned between 2008 and 2017 as part of the National Socio-economic Development Strategy, with the bulk of the investment (US \$19M) beginning in 2014.<sup>40</sup> These works are led by the Department of Water and include waterworks infrastructure (US \$4.9M), the development of centralised wastewater systems (US \$18.6M), and the development of a Water and Wastewater Department through restructuring and building capacity within the Ministry of Works.<sup>41</sup>

In bio-diversity: Strengthening protected area networks is one way of adopting an ecosystem-based approach to adaptation. There are a number of on-going initiatives that reinforce the integrity of the network of protected areas (detailed above) projects include: The *Caicos Pine Recovery Project* under Overseas Territories Environment Programme (OTEP); The *Lionfish Project* funded by Defra; The National Vegetation and Mapping Project conducted by the TCI Department for Environment and Coastal Resources (DECR) and a programme for the monitoring of coral reef conducted by DECR (TCI Department for Environment and Coastal Resources).<sup>42</sup> Nine research projects have been conducted since 2009.<sup>43</sup>

In infrastructure, there have been some specific measures, including a seawall with groynes in Historic Cockburn Town, Grand Turk<sup>44</sup>.

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

## Exacerbating Stresses



The TCI comprise low lying land (<75 m), worsening the potential consequences of any sea level rise.<sup>45</sup> They are also susceptible to tourism and development pressures, particularly on beaches which are one of the most dynamic and fast changing parts of the landscape.<sup>46</sup>

Located within the Atlantic Hurricane Belt, the TCI is fortunate to have been significantly impacted by fewer than 20 storms since 1492.<sup>47</sup> Vulnerabilities do exist – Hurricane Irene caused major flooding in August 2011, leaving roads and buildings under three feet of water for days.<sup>48</sup> UNECLAC estimated the cost of damage arising from tropical storms Hannah and Ike in 2008 at \$22,862,509.00, half of which came from impacts to the tourism sector<sup>49</sup>.

<sup>39</sup> Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Rutty, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies

<sup>40</sup> DEPS. (2007): National Socio-economic Development Framework (2008-2017): Implementation Plan. Department of Economic Planning and Statistics, Government of the Turks and Caicos Islands cited in Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Rutty, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies

<sup>41</sup> *ibid*

<sup>42</sup> Department of Environment and Coastal Resources, 2012b. *DECR Projects*. [Online] Available at: <http://www.environment.tc/Recent-Programmes.html> [Accessed on 10 April 2012]

<sup>43</sup> Department of Environment and Coastal Resources, 2012c. *Research Projects*. [Online] Available at: <http://www.environment.tc/Recent-Research.html> [Accessed on 10 April 2012]

<sup>44</sup> Simpson, M. C (2012)

<sup>45</sup> Oldfield, S., (1999). " Biodiversity in the UK Overseas Territories"

<sup>46</sup> Stanley, M., 2009. *Geoconservation in the Overseas Territories of the UK*. Peterborough, UK: Joint Nature Conservation Committee

<sup>47</sup> Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Rutty, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies

<sup>48</sup> *ibid*

<sup>49</sup> ECLAC (2008): " Turks and Caicos Islands: Macro Socio-economic Assessment of the Damage and Losses Caused by Tropical Storm Hanna and Hurricane Ike. Port-of-Spain, Trinidad and Tobago: Economic Commission for Latin America and the Caribbean accessed 26 07 2012 on line <http://www.eclac.cl/cgi-bin/getProd.asp?xml=/publicaciones/xml/2/35272/P35272.xml&xsl=/portofspain/tpl-i/p9f.xsl&base=/portofspain/tpl/top-bottom.xsl>

## Future Opportunities

### Potential Adaptation Interventions

“Actions need to be taken to minimize infrastructure losses in vulnerable areas of Turks and Caicos. The current and projected vulnerabilities of the tourism sector to SLR, including coastal inundation and increased beach erosion, will result in economic losses for the Turks and Caicos Islands and its people. Adaptations to minimize vulnerabilities in the Turks and Caicos Islands will require revisions to development plans and investment decisions”<sup>50</sup> Very few concrete interventions have been defined. The *Climate Change Green Paper* for Turks and Caicos Islands provides the most comprehensive framework for action, though potential options remain un-prioritised. Potential Short-term actions are presented in the following table.<sup>51</sup>

Sector	Short-term actions
Biodiversity	<ul style="list-style-type: none"> <li>- Enforce the existing laws to enhance resilience of coral ecosystems</li> <li>- Develop and early warning system for marine invasive species. Endangered Species Bill and Wildlife and Biodiversity Protection Bill to come into force to enhance resilience of flora and fauna</li> <li>- Develop terrestrial Habitat Maps for the islands</li> <li>- Enhance resilience of marine and terrestrial flora and fauna through the improved management of pollution and waste</li> <li>- Establish and maintain buffer zones and migration pathways</li> </ul>
Water resources	<ul style="list-style-type: none"> <li>- Build local understanding on the links between predicted climate change and its impacts on water resources at local level</li> <li>- Educate the public on water conservation measures</li> <li>- Educate the public about improving water capture in households</li> <li>- Repair and expand public infrastructure for water capture and storage</li> </ul>
Agriculture and Fisheries	<ul style="list-style-type: none"> <li>- Promote the use of locally-grown crops and develop a warning system for invasive species that threaten agricultural production</li> <li>- Educate fishermen and encourage sustainable fishing practices</li> <li>- Enforcement of current laws to protect fisheries by TCI government</li> </ul>
Tourism	<ul style="list-style-type: none"> <li>- Encourage the tourism industry to reduce energy use and conserve water resources</li> <li>- Enforce and improve existing laws concerning set-backs for coastal development</li> <li>- Build eco-friendly designs</li> </ul>
Energy Supply and Use	<ul style="list-style-type: none"> <li>- Utilize recommendations in the Energy Policy (see Potential LCD Interventions)</li> </ul>
Industry and Commerce	<ul style="list-style-type: none"> <li>- Environmental Management Bill to come into force</li> <li>- Make the completion of EIA's a mandatory condition for the approval of all commercial development activities</li> <li>- Prohibit illegal sand mining and preserve sand sources for beach replenishment</li> </ul>
Human Health	<ul style="list-style-type: none"> <li>- Educate the public about best practices to deal with vector and water borne diseases</li> <li>- Remove potential breeding sites for mosquitoes</li> </ul>

The annual cost of meeting key priorities for biodiversity conservation set up in the *Environment Charter* and *Ramsar Site Management Plan* were estimated to be £287,000 for the period 2007-2012.<sup>52</sup>

A recent UNECLAC study proposes the construction of elevated, storm-resistant water reservoirs of at least 30 metres in height<sup>53</sup>.

<sup>50</sup> Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Ruddy, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies

<sup>51</sup> Climate Change Committee, 2011. *Turks and Caicos Islands Climate Change Green Paper*. Belmopan, Belize: Caribbean Community Climate Change Centre

<sup>52</sup> Rayment, M., 2007. *Costing Biodiversity Priorities in the UK Overseas Territories. Final Report*. Plymouth: GHK.

## Implementation Capacity



As part of a wider DFID funded Enhancing Climate ACC process funded by the UK DFID and facilitated by the Caribbean Community Centre for Climate Change, a Climate Change Committee was established in 2010 to guide the development of the Climate Change Green Paper and the development of a full National Climate Change Adaptation Strategy and Action Plan and a Climate Change Public Education and Outreach Strategy<sup>54</sup>.

Employing 17 staff, the Department of Environmental and Coastal Resources (DECR) is responsible for ensuring sustainable utilisation of the natural resources of the TCI, protecting and promoting biodiversity and economic prosperity through a sustainable fishing industry and a protected areas system. It is the lead agency for climate change. DECR is constrained by a limited staff and finances. Only six enforcement officers are available to patrol the waters around the entire Caicos Banks from Providenciales to French Cay<sup>55</sup>. The Fisheries Division and Protected Area Division share personnel so that in some cases Fisheries Officers may act as Park Wardens and Park Wardens may act as Fisheries Officers. The officers are too few in number to effectively enforce regulations over marine areas, which account for more than 90% of TCI's territorial extent. Furthermore the DECR's current budget for staff has been reduced by 27% from 2008-09 levels, and money for repairing and operating boats has been cut even more limiting their capacity to monitor activities and enforce regulations within MPAs<sup>56</sup>. The National Environment Centre (NEC) was funded as part of DFID/ TCGI Project and falls under DECR's remit providing a focal point for public education and outreach.<sup>57</sup>

In water and utilities responsibilities are split between government and private sector entities. Capacity levels are unknown.

For the management of coastal zone areas, there are a number of Government institutions with a stake in planning and management, including the DECR, and the Planning Department, both within the Ministry of Natural Resources. Capacity levels are unknown.

The Department of Disaster Management and Emergencies is the agency responsible for disaster management activities. Disaster risk reduction (DRR) and hazard and vulnerability assessment are just a few of the activities undertaken by the agency. The Department's report on progress against the Hyogo Framework for Action in 2010 reports that limited budgetary allocations and limited human resources have prevented significant progress on the implementation of DRR plans and activities<sup>58</sup>.

## Low Carbon Development (Source)

### Current Emissions

#### Share of Current Emissions



TCI are not covered by the UK GHG Inventory.

<sup>53</sup>The Department of Economic, Planning and Statistics (DEPS), (2008) cited in ECLAC (2011): "An Assessment of the Economic Impact of Climate Change on the Water Sector in the Turks and Caicos Islands" ECLAC Caribbean Sub-regional

<sup>54</sup> TCI Climate Change Committee (2011): "Turks and Caicos Islands Climate Change Green Paper"

<sup>55</sup> Green, R. (2011). Conch being taken illegally from parks- 17/7. Retrieved 9/9/2011 from FP Turks and

Caicos:[http://www.fptci.com/index.php?option=com\\_content&view=article&id=2715:conch-being-taken-illegally-from-parks&catid=18:local&Itemid=26](http://www.fptci.com/index.php?option=com_content&view=article&id=2715:conch-being-taken-illegally-from-parks&catid=18:local&Itemid=26) cited in Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S.,

Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Rutty, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) -Turks and Caicos Islands. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies

<sup>56</sup> ibid

<sup>57</sup> Department of Environment and Coastal Resources, 2012c. *Our Mission*. [Online] Available at: <http://www.environment.tc> [Accessed on 10 April 2012]

<sup>58</sup> Department of Disaster Management and Emergencies (2010): "Turks and Caicos Islands National progress report on the implementation of the Hyogo Framework for Action (2009-2011)" [online] Available at: [http://www.preventionweb.net/files/15576\\_tca\\_NationalHFProgress\\_2009-11.pdf](http://www.preventionweb.net/files/15576_tca_NationalHFProgress_2009-11.pdf) [Accessed on 25 April 2012]



## GHG Abatement

### Abatement Potential

The TCI are working on the *Development of an Energy Conservation Policy and Implementation Strategy* under the OTEP. The objectives will be to promote viable renewable energy and energy efficiency and conservation projects that will reduce the TCI's dependency on imported fossil fuels, and to reduce electricity costs and prices, as absolute priority, while also improving energy security, and increasing local and global environmental sustainability.<sup>59</sup>

The absolute potential for renewable energy on the TCI is currently unknown, though both utility companies TCU and PPC have shown interest. TCU have estimated that renewable energy capacity could amount to 32% for wind; and 18-20% for solar PV.<sup>60</sup>

There are, however, conflicting approaches, both in policy and in the approaches of the two utility companies, PPC and TUC. The Climate Green Paper highlights the need to increase the use of renewable energy, while the draft Energy Conservation Policy and Implementation Strategy states that "*the TCI are one of the smallest countries in the world—the price it would pay by mitigating greenhouse gas emissions would be hugely disproportionate to any benefits it could reap*"<sup>61</sup>. Details of PPC and TUC are provided in "*Current Abatement Activities*" below.

### Current Abatement Activities

The adoption of energy efficient technologies in the TCI is still limited. Limited exceptions include, lighting through T8 lamps in some non-residential facilities, the widespread use of LCD monitors, a number of efficient retail generators and the high penetration of variable frequency drives, which are used also in two reverse osmosis systems. There is limited uptake of renewable energy in the TCI: the rare exceptions are small solar and wind systems distributed at customer premises that are not connected to the grid.

TCU, one of the companies supplying electricity, submitted a proposal in 2009 for a hybrid wind-solar PV-diesel system including eight to nine wind turbines (650-850kW each) and about 1MW of solar PV. A detailed assessment of the wind resources is currently on-going.<sup>62</sup>

## Future Opportunities

### Potential LCD Intervention

Both the TCI Climate Change Green Paper and the Castalia 2011 report on the *development of an Energy Conservation Policy and Implementation Strategy for the TCI* provide a range of potential activities<sup>63</sup>. The Castalia report concludes that are potential opportunities to develop wind utility at scale, take forward waste-based technologies and promote solar water heaters, but notes that opportunities are blocked by barriers related to utility regulation, third party generation regime, access to credit, and information.

On wind energy, the TCU require funding for further investigation into the potential for wind energy and the PPU were seeking to commission their own wind generation work in 2011 (status unknown). A summary of the

<sup>59</sup> Castalia, 2011. *Development of an Energy Conservation Policy and Implementation Strategy for the Turks and Caicos Islands – Draft Final Report*. Turks and Caicos Islands: Government of the Turks and Caicos Islands

<sup>60</sup> *ibid*

<sup>61</sup> *ibid*

<sup>62</sup> Castalia, 2011. *Development of an Energy Conservation Policy and Implementation Strategy for the Turks and Caicos Islands – Draft Final Report*. Turks and Caicos Islands: Government of the Turks and Caicos Islands

<sup>63</sup> *ibid*

key aspects of the Castalia strategy are provided below in a set of action points. The responsibility for these lie mostly with government. These are:

Action 1: Change the regulation of the power sector to promote economically viable renewable energy at utility scale

Action 2: Change the regulation of the power sector to promote economically viable renewable energy at distributed scale

Action 3: PPC and TCU to establish a Grid Code

Action 4: Change the regulation of the power sector to allow PPC and TCU to recover investments in energy efficiency

Action 5: Identify the best waste management solution for the TCI, and establish a clear procurement process for implementing it

Action 6: Favour the assessment and development of wind energy

Action 7: Mandate Solar Water Heaters in new buildings, and promote them in existing ones

Action 8: Promote efficient and renewable air conditioning in hotels

Action 9: Promote widespread adoption of Compact Fluorescent Lights (CFLs)

Action 10: Leave customs incentives largely as they are, but eliminate discriminations and loops for sub-standard equipment

Action 11: Mandate Energy Efficiency in the Building Code and Development Manual

Action 12: Procure an ESCO for retrofitting public buildings and marketing to large consumers

Action 13: Negotiate an arrangement for retrofitting street lights

Action 14: Outsource water operations in Grand Turk, South Caicos, and Salt Cay.

### Implementation Capacity

The Department of Environmental and Coastal Resources (DECR) is responsible for the development of a sustainable energy policy, whereas the electricity commissioner, working under the Ministry of Works, Housing and Utilities, is responsible for service tariff regulation.<sup>64</sup>

The utility companies PPC and TUC may take ownership for driving forward the on-grid renewable agenda<sup>65</sup>.

## UK Exposure

### UK Sunk Assets

UK sunk assets data was not available.

### Absolute Value of UK Transfer

The crisis of political and economic governance which emerged in 2008, has led to the imposition of direct HMG rule, the launching of anti-corruption investigations and, with the economy experiencing serious

<sup>64</sup> Castalia, 2011. *Development of an Energy Conservation Policy and Implementation Strategy for the Turks and Caicos Islands – Draft Final Report*. Turks and Caicos Islands: Government of the Turks and Caicos Islands

<sup>65</sup>ibid



problems, the exceptional introduction by the British Government of a rescue package in the form of a loan guarantee of £160 million over five years<sup>66</sup>.

The UK has also funded the costs of the Special Investigation and Persecution Team (SIPT) and the civil recovery process, as well as police costs incurred to combat the spike in violent crime in 2010-2011, providing an extra \$10.5 million to TCIG for this purpose. The UK has also provided a further one-off \$3.2 million grant to support public service reforms.<sup>67</sup> Moreover, UK continues to bear significant costs to provide TCI with a civil aviation regulatory system. They were estimated to be \$339,000 per year for a minimum of five years in 2007.<sup>68</sup>

### Share of National Budget from UK Transfer



Total budget of TCI Government for 2011-2012 is equal to about \$170 million.<sup>69</sup> A precise figure of the share of the budget provided by the UK government was not available.

### Potential Liability



Offshore financial services are significant secondary industries in TCI and damage to this sector could lead to increased UK liabilities.<sup>70</sup>

TCI are among the signatories of the following multilateral environmental agreements:<sup>71 72</sup>

- 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
- 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
- Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)
- Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention) Protocol on Specially Protected Areas and Wildlife.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- International Convention on the Regulation of Whaling.

Further reputational risks (and contingent liability) are associated with the islands featuring on the UK tentative list (drawn up in March 2011) for future nominations for a World heritage Site, under UNESCO's World Heritage Convention.

### Reputational Risks



In the aftermath of the economic and political crisis in the TCI, in 2011 DFID put in place a five year guarantee with commercial lenders to support the TCI Government. Offshore financial services are significant secondary industries in TCI and damage to this sector could lead to increased UK liabilities.<sup>73</sup>

<sup>66</sup>HMG, House of Commons International Affairs and Defence Section; Economic Policy and Statistics Section (2011): "The Turks and Caicos Islands - SN/IA/5038" House of Commons Library

<sup>67</sup> Coward, s., 2011. *Turks & Caicos: Budget Summary*. [Online] Available at: <http://www.caribbeanpressreleases.com/articles/8244/1/Turks-amp-Caicos-Budget-Summary/Page1.html> [Accessed on 10 April 2012]

<sup>68</sup> National Audit Office, 2007. *Foreign Commonwealth Office - Managing risk in the Overseas Territories*. London: The Stationary Office

<sup>69</sup> Government of the Turks and Caicos Islands, 2011. *Budget 2011-2012*. [Online] Available at: <http://www.gov.tc/portal/page/portal/Dynamic%20Content%20Generator/Documents%20Repository/Budget%202011.pdf> [Accessed on 10 April 2012]

<sup>70</sup> National Audit Office, 2007. *Op cit*.

<sup>71</sup> DEFRA, 2012. *The Environment in the United Kingdom's Overseas Territories: UK Government and Civil Society Support*. London, UK: DEFRA

<sup>72</sup> Oldfield, S., (1999). "Biodiversity in the UK Overseas Territories"

<sup>73</sup> National Audit Office, 2007. *Foreign Commonwealth Office - Managing risk in the Overseas Territories*. London: The Stationary Office

Following the 2009 Auld Commission, which identified the high probability of systemic corruption in government and among public officers in the TCI, the ministerial government was suspended and a programme of reform took place. Only in 2012 has HMG announced that enough progress has been made to set elections later in the year. There is significant reputational risk to HMG if these issues are not fully resolved.

The TCI are also a destination and transit point for illegal Haitian immigrants and a transshipment point for South American narcotics destined to the US and Europe.<sup>74</sup>

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<sup>74</sup> CIA, 2012. *The World Factbook*. [Online] Available at: <https://www.cia.gov/library/publications/the-world-factbook/geos/tk.html> [Accessed on 12 April 2012].

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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 <sub>2</sub> 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.

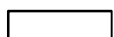
Implementation Capacity	Current (March 2012) capacity to design, implement and monitor all related low carbon / adaptive capacity activities. This includes all current resource constraints (i.e. funding, local personnel capacity, lack of personnel, supportive infrastructure etc.) and opportunities.
Importance 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 <sub>2</sub> 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 <sub>2</sub> 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, 2008<sup>i</sup></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, 2010<sup>ii</sup>; Parry et al., 2007<sup>iii</sup></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<sup>iv</sup></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<sup>v</sup></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<sup>vi</sup></i></p>
Industry and Commerce	<p>Industry - Industry includes manufacturing, mining, construction and related informal production activities. Other categories, such as transport, energy supply &amp; 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<sup>vii</sup></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<sup>viii</sup>.

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

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

<sup>iii</sup> 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.

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

<sup>v</sup> 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>

<sup>vi</sup> 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

<sup>vii</sup> 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].

<sup>viii</sup> 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
<b>Threats Exposure Analysis</b>					
	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
<b>Resource Exposure</b>					
	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
<b>Importance to Overseas Territory</b>					
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 <sup>1</sup>  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

<sup>1</sup> 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
<b>Vulnerability (Current)</b>					
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
<b>Future Opportunities</b>					
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
<b>Current Emissions</b>					
4.1	Share of Current Emissions	High (>30%)	Medium (15%-30%)	Low (5%-15%)	None/Marginal <5%.
<b>GHG Abatement</b>					
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
<b>Future Opportunities</b>					
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: Turks and Caicos Islands - Scored VAM

RED
RED/AMBER
GREEN/AMBER
GREEN

Threat Exposure Analysis		
	Frequency and Severity	
	Current	2050
<b>Climate Change Exposure</b>		
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	0%	Medium
2 Hydro	0%	None
3 Solar PV	0%	Low
4 Geothermal	0%	None
5 Biomass	0%	None
6 Waste (solid, liquid)	0%	Medium
<b>Low Carbon Heat Potential</b>		
	% of buildings	Potential
1 Solar Thermal	X	Medium
2 Biomass	0%	None
<b>Liquid Fuels</b>		
	% of consumption	Potential
1 Bioethanol	0%	X
2 Bio diesel	0%	X

## Turks and Caicos Islands

Summary
<p>The Turks and Caicos Islands (TCI) are a group of 8 main islands and numerous smaller cays in the Caribbean covering 430 sq km. Population of 32,700 people (on six islands). Tourism and financial services are main contributors to GDP (\$860 million). Fishing is the major employment sector.</p> <p><b>Threat Exposure Analysis</b>                      Experienced events: since the 1950s, air temperatures increased by 2°C; number of very warm days increased but number of very warm nights decreased. Frequency of droughts increased since 1960. 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 1.1°C to 6.4°C; increase in extreme events and category 4 and 5 hurricanes; sea level to increase by 18 cm to 59 cm; decrease of total rainfall and change in rainfall patterns. Electricity produced through diesel generators dependent on imported fuel. Potable water generated through desalination processes.</p> <p><b>Adaptation and Resilience</b>                      Presence of flora and fauna species of global conservation concern. More than 30 protected areas designated. Limited freshwater resources available. Tourism, finance industry and fishing main economic activities. Per-capita GDP of \$26,280 and life expectancy of 79.26 years. Expected loss of biodiversity. Coral reefs to be endangered; negative impact on tourism. Water resources to decrease. Negative impacts on agriculture and fisheries; consequences on livelihood. Increased outbreak of water-borne diseases and deaths (also associated to heat waves) expected. Ramsar site created in 1990. On-going projects for the protection of biodiversity. National Climate Change Adaptation Strategy and Action Plan and Climate Change Public Education and Outreach Strategy under elaboration. Action plans reported in Climate Change Green Paper. Presence of a Department of Environmental and Coastal Resources.</p> <p><b>Low Carbon Development</b>                      TCI not covered by UK GHG Inventory. OTEP project for the Development of an Energy Conservation Policy and Implementation Strategy. Adoption of energy efficiency and renewable energy technologies still very limited. EE technologies with a high potential are compact fluorescent lamps, power monitors, premium efficiency motors, efficient window A/C systems and magnetic induction street lighting. The Government is already supporting the use of electric and hybrid vehicles with a reduced import duty RE technologies characterised by both economic and financial viability are waste landfill gas to energy, waste to energy, solar water heaters, wind and sea water air conditioning.</p> <p><b>UK Exposure</b>                      UK Government backed financial support in 2010-2011, as well as extra support to combat crimes (\$10.5 million), develop public sector reforms (\$3.2 million) and civil aviation regulatory system (\$339,000 per year). UK loan to finish in 2012/2013. TCI signatories of several environmental agreements. TCI considered a unique challenge in terms of managing UK's responsibilities and potential liabilities by DFID and FCO.</p> <p><b>Exacerbating Risks</b>                      Tourism and development pressures; Low-lying areas (no land over 75 m).</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						
	Hydrology and Water resources						
Economic	Tourism						
	Transportation						
	Agriculture and Fisheries						
	Energy Supply and Use						
	Industry and Commerce						
Social Systems	HDI/Livelihoods/Poverty						
	Human Health						

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

Low Carbon Development (Source)	Current Emissions	GHG Abatement (Current)		Future Opportunities	
	Share of Current Emissions	Abatement Potential	Current Abatement Activities	Potential LCD Intervention	Implementation Capacity
Energy Supply	X	X			
Transport	X	X			
Public	X	X			
Business	X	X			
Residential	X	X			
Industrial Processes	X	X			
Agriculture	X	X			
Waste management	X	X			
Land Use, Land Use Change and Forestry	X	X			

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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