

# OVERVIEW AND HOTSPOTS ANALYSIS OF THE TOURISM VALUE CHAIN IN SAINT LUCIA



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## Executive Summary

In 2017, WRAP (Waste and Resources Action Programme, UK) and UDP (United Nations Development Programme) conducted an assessment of the environmental impact hotspots<sup>1</sup> associated with the tourism sector in Saint Lucia. The purpose of the assessment was to support policy makers, businesses and international organisation in finding feasible solutions to reduce GHG emissions and improve resource efficiency (RE) in tourism value chains. The methodology used was based on the 2017 Life Cycle Initiative overarching methodological framework for hotspots analysis.<sup>2</sup>

The aim was to use a combination of a top-down approach (using national input-output databases) and a bottom-up approach (using hotel Survey data). Many of Saint Lucia's tourism value chains extend beyond its national boundaries, as there is a great reliance on imports. However, these were not covered in the national input-output database used, and therefore is poorly represented in this analysis. Supporting analysis of imports was also undertaken but this too lacked sufficiently detailed data. Due to difficulties in obtaining survey data from the hotels and the lack of detailed information on imports, the final hotspot analysis was based on top down approach only, and supplemented with our experience from other project counties.

The lack of national-level data for Saint Lucia required the use of proxy data drawn from three other Caribbean islands of varying sizes (Antigua, the British Virgin Islands and the Dominican Republic) to inform the top-down approach. Data gaps resulting from incomplete hotel survey data in the bottom-up approach also required additional sense checking of the top-down data to improve confidence levels around the hotspots identified.

In order to better understand the location and context for environmental hotspots during this analysis the tourism value chain for Saint Lucia was mapped to illustrate how the tourism sector operates, how it is supported by other sectors of the economy (e.g. building and construction, facilities management, food and beverage, transportation), what activities are in scope in Saint Lucia (see **Figure 3**); and which value chain actors are able to control or influence the environmental hotspots identified during the analysis (see **Figure 4**). It is also worth noting that Saint Lucia imports between 60-65% by weight of food and beverage products required in the tourism sector from other countries, so efforts to reduce the environmental impacts in the sector need to include engagement and collaboration with overseas suppliers. Further information on the approach taken to map and define the tourism value chain in Saint Lucia can be found in **Section 3.2** below).

The environmental impact hotspots identified for the tourism sector in Saint Lucia are broadly split between:

- **Electricity and fuel use in hotels and restaurants**, and its impacts upstream in the value chain including energy generation and its climate change impacts and environmental impacts associated with the extraction of raw materials (fossil fuels: coal, oil and gas), their conversion to electricity or heat and the transmission of energy.

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<sup>1</sup> Environmental hotspot is a process which accounts for a significant proportion of the negative environmental impact in the value chain. Value chain is the entire sequence of activities or parties that provide or receive value in the form of products or services (e.g. suppliers, outsourced workers and contractors).

<sup>2</sup> **Source:** <http://www.lifecycleinitiative.org/new-hotspots-analysis-methodological-framework-and-guidance/>

The 2015 commercial electricity rates in Saint Lucia were \$0.47 per kilowatt-hour (kWh), higher than the residential tariff of \$0.34 per kilowatt-hour (kWh), which is in line with the Caribbean regional average of \$0.33/kWh, suggesting this could be a driver of energy efficiency and renewable energy programmes in the tourism sector. Energy audits in Caribbean hotels indicate that on average 30% of hotel energy costs are related to air conditioning;

- **Primary production of food and beverage** and related climate change, energy, water and waste impacts (e.g. meat, fish and seafood and fresh produce production). Later stages in food value chains, such as processing and cooking, also carry significant impacts. Saint Lucia imports between 60-65% by weight of the food and beverage products required for the tourism sector each year; with one participating hotel reporting that it waste 41% of the food it buys; and WU (2014): [Global Material Flows Database](#) suggests that unused food accounted for 65,000 tonnes of waste in Saint Lucia in 2013, 98% of wasted biomass in Saint Lucia. This is equivalent to 54% of biomass harvested for food, suggesting significant opportunities for efficiency gains.
- **High generation and inappropriate treatment of liquid and solid waste in hotels and restaurants**, and associated climate change, water and waste impacts. These are leading to pollution of land, water and air and are worsened by deficiencies in national infrastructure. E.g. ground water, river and marine pollution from leachate at open, unsealed landfill sites, air pollution from fires caused by methane emissions at landfill sites; marine plastic pollution; water/marine pollution from untreated or inadequately treated wastewater.
- **Water use in hotels**, e.g. washing and sanitation, cleaning of rooms and public spaces; and for leisure activities, like swimming pools and spas.

A summary of environmental impact hotspots by tourism activity and impact category can be found in **Table 1**. More detail on the approaches taken to hotspots analysis and key findings can be found in Section 4 of the report below, with a further summary table of hotspots organised by product category and [lifecycle stage](#) in Annex F of this report.

**Table 1: Summary table of hotspots across environmental impact categories for Saint Lucia**

Summary of hotspots across environmental impact categories – Saint Lucia				
Rank	GHG	Energy	Water	Waste
1	<p><b>Primary production of meat and dairy products:</b> GHG emissions from the rearing of livestock for meat and dairy products (e.g. methane emitted through bovine enteric fermentation (digestion) and production of manures) are likely to be significant hotspots for hotels and restaurants in the tourism sector. Saint Lucia produces very little milk and poultry products, so the bulk of these products are imported, requiring engagement and collaboration with overseas suppliers.</p>	<p><b>Transportation:</b> the transportation sector is the highest single user of energy in Saint Lucia<sup>3</sup>, whether in transportation and distribution of food products, particularly for imported goods; or from tourists participating in tours, excursions or using taxis and hire cars.</p>	<p><b>Primary production of animal feed and livestock:</b> water use in feed production (including irrigation water) and for livestock (drinking and cleaning water).</p>	<p><b>Food waste in hotels and restaurants:</b> WRAP estimates an average of 7-12% meat waste and 20% of edible vegetable parts are wasted in hotel kitchens and by customers, with one hotel survey return indicating overall food waste levels of 41%. Solid waste from hotels has been rising at a rate of 5% a year since 2008<sup>4</sup>. Additionally, the lack of private and public-sector infrastructure for collection and treatment of food/organic waste leads to wasted resource and high methane emissions from open, landfill sites</p>
2	<p><b>Direct Electricity and fuel use in hotel and MICE establishments:</b> lighting, heating, ventilation and air conditioning (HVAC) of rooms, public spaces, back of house areas. In 2007, hotels in Saint Lucia accounted for 20% of the commercial sectors energy demand<sup>5</sup>. Energy audits in most Caribbean hotels identify HVAC as a major contributor to energy costs, accounting for up to 30% of total energy use. In order to deliver Saint Lucia’s Nationally Determined Contribution (NDC) targets under the Paris Agreement (November 2015), energy efficiency measures need to displace 11% of its energy generation needs by 2025.</p>	<p><b>Direct water use in hotels and restaurants:</b> guest washing and sanitation, cleaning of rooms and public spaces, laundry services, food preparation and cooking, irrigation of grounds, swimming pools and the treatment of waste water and sewage by hotels are all likely to be significant uses of water in the Saint Lucia tourism sector<sup>6</sup>.</p>	<p><b>Primary production of fresh produce:</b> in-field, unharvested crops and immediate post-harvest crop waste due to supply chain quality requirements and poor demand forecasting (estimates are up to 20% losses/waste).</p>	

<sup>3</sup> SLU Economic and Social Review 2014-2015.

<sup>4</sup> The Saint Lucia Solid Waste Management Authority Annual Report 2014-15.

<sup>5</sup> Source: The [Inter-American Development Bank \(2015\)](#). NOTE: for Antigua, British Virgin Islands and the Dominican Republic, the largest use of energy for hotels is using electricity, which accounts for 55-57% of energy use. Given the information from the Inter-American Development Bank (2015), it seems likely that electricity use in hotels in St Lucia will also be a hotspot for energy.

<sup>6</sup> [UNEP \(2016\)](#) identify that hotels account for 10% of water withdrawals for municipal / industrial use, suggesting that hotels directly account for 1.2 Mm<sup>3</sup> of water p.a. in Saint Lucia.

Summary of hotspots across environmental impact categories – Saint Lucia

Rank	GHG	Energy	Water	Waste
3	<p><b>Primary production of fresh produce:</b> emissions from use of fertilizers and methane emissions from organic wastes. Fuel use for in-field operations. NOTE: Saint Lucia produces some fresh produce domestically, particularly bananas (15,000 tonnes), coconuts (14,000 tonnes), and some other fruits (7,000 tonnes) but imports between 60-65% by weight of the food and beverage products required for the tourism sector each year.</p>	<p><b>Processing and manufacturing of meat and poultry products:</b> slaughterhouse processing and energy used in chilled storage and refrigeration contributes to post-farm gate emissions. NOTE: the vast majority of meat is imported into Saint Lucia.</p>	<p><b>Primary production of produce and beer:</b> water used to grow fruit, vegetables and other food crops is likely to dominate water use across the life cycle based on proxy data for the tourism sector in three other Caribbean islands<sup>7</sup>. 14,000 tonnes of beer is produced domestically in Saint Lucia, representing another likely significant use of water in the brewing process.</p>	<p><b>Direct solid waste generation in hotels and restaurants,</b> leading to lost resources to the national economy as a result of no recycling infrastructure: according to the Saint Lucia Solid Waste Management Authority (SLSWMA) hotel waste has been rising at a rate of 5% a year since 2008. Hotels account for 9% of national waste arisings and no separate figures are available for restaurants as they are aggregated with all forms of commercial waste<sup>8</sup>. The latest publicly available statistics (April 2014-March 2015) suggest that all wastes at that time (71,899 tonnes) were landfilled at the island's two landfill sites and no materials are separated or recycled.</p>
4	<p><b>Primary production of fish and seafood products:</b> based on proxy data fish and seafood products used in hotels and restaurants are likely to represent a hotspot in the tourism sector in Saint Lucia.</p>	<p><b>Processing and manufacturing of fresh produce:</b> energy use in the processing and packing of produce, energy use in product chill chain or for freezing of produce post-harvest.</p>	<p><b>Water use in the electricity generation:</b> water used in cooling in power generation, emitted as steam and not returned to water source.</p>	<p><b>Waste generation of single use items in hotels and restaurants,</b> and the associated marine pollution. Plastic packaging, water bottles, cups, drinking straws, etc. creating litter and marine pollution, damaging natural environments. NOTE: Management of Containers Bill, explores a strategy and incentives to reverse the proliferation of plastic bottles in the environment, which has become a major pollutant and a cause of flooding in urban centres (plastics accounted for 22% of national solid waste in 2008)<sup>9</sup>.</p>

<sup>7</sup> Over 96% of the water use associated with hotels is found in the value chain in Antigua, the British Virgin Islands and the Dominican Republic. Most of this is associated with agriculture, food and beverages. [Yang et al \(2011\)](#), [Hadjikakou et al \(2013\)](#), [Cazarro et al \(2014\)](#) and [Zhang et al \(2017\)](#) find that tourist demand for food dominates the water footprint of tourism in a range of countries, with treatment of sewage from hotels also important. There is no reason to assume that St Lucia differs to these.

<sup>8</sup> The Saint Lucia Solid Waste Management Authority ([SLSWMA \(2016\)](#)).

<sup>9</sup> Source: SLSWMA Waste Characterisation Study 2008.

Those hotspots identified and quantified by the UDP and WRAP were then validated at a workshop with tourism stakeholders in June 2018. At the same workshop, stakeholders were consulted to seek their views on the range of solutions and interventions that could be implemented to address key environmental impact hotspots, primarily in tourism business value chains but with some reference to the national-level solutions and interventions required to enable or support actions by private sector tourism companies. Those solutions and interventions suggested at the workshop were then supplemented through desktop research and further discussions with stakeholders to arrive at an agreed long list of potential solutions and interventions, which, in turn, were split out into solutions relevant to tourism business value chains and those requiring interventions at a national-level, either through the development of government policies and strategies or through improvements in national or regional infrastructure. This long list can be found in summary form at Section 7 of this report and is presented in Annex F as a fuller list of actions and activities.

To summarise, the long list covers the following range of solutions and interventions:

**Business value chain solutions and interventions:** have the potential to be implemented by individual tourism businesses and value chains or via collaborations between tourism businesses and/or the public sector. Some business value chain solutions would benefit from a supportive government policy and strategy framework, like the options for national-level solutions identified below.

- **Sustainable purchasing and value chain initiatives:** that enable multiple hotspots across all impact categories to be addressed, including sustainable procurement policies and practices; appointing a 'green procurement champion'; adopting voluntary sustainability standards for key raw materials (e.g. seafood, timber and paper, textiles); supplier accreditation, environmental KPIs and benchmarking and shared / consortia-based supplier platforms and databases to help identify reliable, high-performing suppliers; the use of product/packaging specifications and healthy, sustainable menus (e.g. product life requirements for hotel furniture and electrical items, local, seasonal sourcing of food).
- **Improving operational practices:** including the provision of information to guests to help them make the right environmental choices when choosing or buying goods and services; adopting healthy, sustainable menus to reduce the environmental 'food print' of food served in destinations; measuring and monitoring food waste; reviewing food storage, preparation and cooking practices (e.g. portion control) and using data analytics to improve inventory management and demand forecasting to reduce food waste; donating uneaten food and establishing food recycling programmes to produce compost and renewable energy.
- **On-site energy management and efficiency:** making significant improvements in energy use by: developing an energy and GHG policy; conducting and acting on the findings of energy audits; specifying energy efficiency and GHG emission improvements in HVAC systems, installing energy storage systems, hotel room energy management systems and electrical equipment (including laundries); installing room energy management systems; and increasing the amount of in-situ renewable energy generation.



- **Sharing best practice and site visits:** the potential for hotels and restaurants to learn from each other's best practices and to learn from other's experiences of implementing solutions (e.g. food waste reduction, energy management, water efficiency).
- **Team training and cross-functional training:** training within and across teams to enable them to minimise their contribution to environmental hotspots and that equips them to help deliver a range of solutions and interventions – e.g. sustainable procurement approaches, monitoring and measuring resource use (food and beverages, water and energy) as well as eco-design tools and techniques for buildings and rooms.

### **National-level solutions and interventions:**

National-level solutions that have been ranked and grouped based on their likely impact and require either actions led by government policy-makers and/or that call for public or public/private sector investment in national and local infrastructure to address identified hotspots. They include:

- **Developing / adapting a National GHG / Energy Policy for the tourism sector:** policies on renewable energy and energy efficiency can provide essential context for business action. It is worth noting that a [National Energy Plan](#) was launched in Saint Lucia in 2010, followed by the introduction of the [St Lucia Energy Roadmap \(2016\)](#).
- **Mandatory and voluntary standards for efficient use of resources and energy in hotels and restaurants:** support the creation of mandatory standards for efficient use of resources and measurement of emissions in all hotels with more than 100 rooms. Voluntary for hotels with 50+ rooms. Also potential to look at mandatory and voluntary standards for the use of solar hot water systems in hotels.
- **Policy support for healthy, sustainable food sourcing, purchasing and diets:** the development of dietary guidance that promotes and supports the use of healthy, low-carbon and resource efficient menus in hotels and restaurants to reduce the greenhouse gas emissions (GHG) resulting from sourcing, menu and consumption decisions. A healthy, low-carbon and resource efficient menu minimizes the emissions released from the production, packaging, processing, transport, preparation and waste of food.
- **National food waste strategy:** develop a national food waste strategy in line with UN SDG target 12.3 to halve food loss and waste by 2030, with specific components and targets for the tourism sector, including food waste reduction targets, incentives to redistribute surplus food to charitable organisations and the provision of food waste recycling infrastructure to enable the production of renewable energy from biogas and compost for use in agriculture.
- **National circular economy policy package:** development of a circular economy policy package that encourages and promotes the development of more sustainable, innovative products and services, including consideration of circular / sustainable product, service and business model design and procurement, the promotion of

sustainability standards and certification in tourism, energy efficiency and product life extension for electrical and electronic products.

- **Enhance legislation and regulation of waste management to optimise waste management and reduce land-based, river and marine pollution.**
- **Enhance legislation and regulation on drinking water quality and wastewater treatment to improve infrastructure, water security and protect tourism biodiversity resources:** the role of legislation in ensuring drinking water quality, working with the Saint Lucia Water and Sewerage Company Inc. (WASCO)
- **Review of [St Lucia Tourism Strategy and Action Plan \(2013\)](#)** to help identify new opportunities for Saint Lucia, as a destination, to be more sustainable, energy efficient and climate sound (for example by using renewable energy) whilst consuming less water and minimizing waste.
- **Making the transportation network more sustainable:** Building on the EU [Sustainable Transport for Areas with Tourism through Energy Reduction \(STARTER\)](#) project and the concept of 'Local Travel Plan Networks (LTPN)', which can be used to shift tourist travel to more sustainable mobility options.

## 1. Introduction

### 1.1. Background

The project "Transforming Tourism Value Chains in developing countries and Small Island Developing States (SIDS) to accelerate more resilient, resource efficient, low carbon development" has been developed in the framework of the International Climate Initiative financed by the German Federal Ministry for the Environment, Nature conservation, Building and Nuclear Safety. The project proposes to transform tourism activities along three key tourism value chains (accommodation, food & beverage, and meetings/incentives/conferences/events – MICE) in participating countries (the Dominican Republic, the Philippines, Mauritius and Saint Lucia), so as to, reduce carbon emissions and improve resource efficiency by implementing low carbon development actions integrated with sustainable consumption and production patterns. This four-year project has two phases: an assessment phase (2017/2018) and an implementation phase (2019/2020). The goals of the assessment phase are to define tourism value chains with high resource use and to identify and assess key environmental indicators for greenhouse gas (GHG) emission and resource consumption impacts (presented as 'hotspots') within these chains.

### 1.2. Purpose

This document is a project report for Saint Lucia. Its purpose is to support decision making of key stakeholders within the Transforming Tourism Value Chain's project so as to prioritise feasible solutions to reduce GHG emissions and improve resource efficiency (RE) in the target value chains during the project's implementation phase and beyond the project timeline in Saint Lucia. The document may also be useful for other tourism stakeholders, e.g. destination management and civil society organizations, policy makers and other public-sector bodies

that design, develop, regulate or manage tourism destinations. In Mauritius and Saint Lucia, this document will specifically provide the context to involve businesses and other private sector actors in the development of policy recommendations and definition of action plan priorities.

The report has been produced by WRAP, with information collated by local partners<sup>10</sup> at the Travel Foundation and with the support of both UN Environment and UDP. The report assesses the accommodation value chain and its impacts at the national level (based on published data). The STAG in Saint Lucia comprised of the national STAG with representatives from Department of Sustainable Development, Ministry of Tourism, Information and Broadcasting, Saint Lucia Chamber of Commerce, Organisation of Eastern Caribbean States(OECS), Massy Stores Supermarket, the SLHTA, University of the West Indies Open Campus, Saint Lucia National Trust, LUCELEC (St. Lucia Electricity Services Limited), Saint Lucia Solid Waste Management Authority and the Regional STAG with representatives of Antigua and Barbuda Ministry of Tourism, Economic Development, Investment and Energy, Discover Dominica Authority, Grenada Ministry of Tourism, Civil Aviation and Culture, Grenada Tourism Authority, St. Kitts & Nevis Ministry of Tourism and St. Vincent & the Grenadines Ministry of Tourism, Sports and Culture reviewed, contributed and validated the findings. The report also includes an assessment at hotel level to provide background information of GHG emissions levels and resource efficiency in Saint Lucia. The findings of this report and associated hotspots have been discussed during a workshop held in June 2018. Based on the identified hotspots, a long list of potential mitigation solutions were produced that were also validated through a consultation process with industry and experts in the workshops. The result was a number of priority areas for action and implementation. Supplementary information and data are contained in the following Annexes:

- A. Saint Lucia Country Context Report;
- B. WRAP template survey of the tourism value chain;
- C. UDP Climate Change Policy Analysis report;
- D. UDP Climate Change Policy Comparison Table;
- E. Summary table of environmental impact hotspots for the Saint Lucia tourism sector organised by impact category and product life cycle stage; and
- F. Long-list of business value chain and national-level solutions and interventions captured during June 2018 country workshops.

### 1.3. Scope of the report

The scope of the report assesses the accommodation value chain, integrating food and beverage value chain aspects and considerations. This approach has been used as the all-

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<sup>10</sup> The Department of Tourism, the Philippines Center for Environmental Protection and Sustainable Development Inc., (PCEPSDI); Mauritius: Ministry of Tourism & External Communications and the Ministry of Environment – Sustainable Development; National Emergency Centre and Beach Authority, and Travel Foundation. Dominican Republic: Association of Hotels Playa Dorada, Ministry of Environment and el Programa Nacional de Producción Más Limpia; The Commission of the Organization of Eastern Caribbean States: representing 6 member states, and Ministry of Tourism of Saint Lucia.

inclusive model is predominant in Saint Lucia and hence both value chains can be addressed using all-inclusive hotels as a point of entry. The value chain approach to tourism covers all stakeholders involved in delivering a tourism experience in the accommodation service (dinning, recreation, leisure, shopping, etc). The analysis covers all goods and services in the respective value chains and the life cycle impacts created by the international and in-country manufacture, storage, distribution, consumption and disposal of these goods and services. Therefore, tourist travel into the country is excluded, but impacts embedded in imported goods and services are included. This enables a strategic way of identifying and prioritizing critical issues along the chain; and facilitates the development of targeted solutions and interventions in order to achieve maximum impact.

The first section of the report (National Context) is an introduction to the Saint Lucia, to understand the context and scale of the tourism industry. The remainder of the report focuses on the activities related to the first assessment phase of the project. Firstly, the outcome of the value chain mapping, the agreed boundaries and the selected sustainability indicators are discussed. Then, the rationale, methodology and outcome of the national level data and local level hotel assessments conducted over five months in 2017, are addressed. The local assessments serve to help understand the structure of the tourism value chain at the company (e.g. hotel) level, such as different types of accommodation, their activities and impact. The report then highlights the quantitative energy and consumables data that was evaluated using tools and models available to UDP and WRAP respectively. This is to provide an initial assessment of the GHG impacts and range in the impacts, at the company-level. Leading from the national assessment and the pilot activity, WRAP developed the long-list of solutions and provided inputs for further prioritization. The quantitative data collected in 2017 has been detailed in this report. The result is the hotspots analysis and the associated long list of potential mitigation options that can be found in summary form in **Section 7** and in more detail in **Annex F** to this report.

For Saint Lucia, the project is focusing on policy recommendations for, and capacity building in low carbon tourism operations. This report will therefore summarise policy intentions, detailed in both UDP's report and a country context prepared by the in-country partner (the Travel Foundation). This will lay the foundation for a future report on policy recommendations, as a result of the hotspots analysis and the associated policy context reports (detailed in **Annex C** and **Annex D** to this report).

## 2. National Context

### 2.1. Overview

The current and forecast levels of travel and tourism have considerable environmental and social impacts. Through the Transforming Value Chains project, we seek to prioritise the activities which contribute the most to environmental impacts. These activities aim to reduce GHG emissions and improve resource efficiency in key tourism sector value chains with high resource use.

This section provides a brief overview of the Tourism Sector in Saint Lucia presented as a summary of a detailed report provide by the Travel Foundation. For the full report please refer to **Annex A**. This section of the report briefly contextualises the tourism industry in Saint Lucia. It is not intended to provide a detailed picture, as this is provided in the full context report in **Annex A**. Instead this section provides an overview of the tourism sector covering geographical information, the economic and employment contribution of tourism to the national economy. This is followed by a summary of visitor arrivals, the typical visitor stay and expenditure, an overview of the accommodation sector, and any accreditation or certification schemes present in Saint Lucia.

## 2.2. Geography of Saint Lucia and the Tourism Sector Overview

Saint Lucia is a tropical island tourism destination of 238 sq. miles with an approximate population of 173,000. It is a democratic constitutional monarchy with a Governor General representing the Queen of England as the Head of State; and a Parliamentary executive lead by a Prime Minister constitutionally elected every five years.

The overall economy has been growing at an average rate of 1.3%<sup>11</sup> between 2006 and 2016. Tourism has been the fastest growing new sector over the past 20 years and now accounts for an average of 16% of GDP over the past 5 years<sup>12</sup>. This highlights the importance of solutions in Saint Lucia to mitigate the growing negative environmental impact caused by tourism.

The direct contribution of travel & tourism to GDP was XCD602.0 million (USD223.0 million), equivalent to 15.0% of total GDP in 2017 and is forecast to rise by 5.8% in 2018, and by 5.9% per annum, from 2018-2028, to XCD1,125.1 million (USD416.7 million), around 20.1% of total GDP in 2028. The total contribution of Travel & Tourism to GDP was XCD1,681.0 million (USD622.6 million), 41.8% of GDP in 2017, and is forecast to rise by 5.1% in 2018, and by 5.7% per annum to XCD3,077.3 million (USD1,139.8 million), around 54.9% of GDP in 2028.

In 2017, travel & tourism directly supported 20,000 jobs (26.4% of total employment in Saint Lucia). This is expected to rise by 6.0% in 2018 and rise by 2.8% per annum to 28,000 jobs (32.3% of total employment) in 2028. In 2017, the total contribution of Travel & Tourism to employment, including jobs indirectly supported by the industry was 50.8% of total employment (38,500 jobs). This is expected to rise by 5.5% in 2018 to 40,500 jobs and rise by 2.9% per annum to 54,000 jobs in 2028 (62.7% of total)<sup>13</sup>.

Tourism currently accounts for 22.7% (17,500 jobs) of the labour force and 46.5% (36,000 jobs) including jobs indirectly<sup>14</sup> supported by travel and tourism<sup>15</sup>. The economic performance

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<sup>11</sup> SLU Social and Economic Review 2015-16, p.6

<sup>12</sup> Saint Lucia Country Data Sheet, 2011-2015, World Bank

<sup>13</sup> WTTC Travel & Tourism Economic impact in Saint Lucia 2018 <https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2018/stlucia2018.pdf>

<sup>14</sup> Jobs directly supported by tourism include hotels, airlines, airports, travel agents and leisure and recreation services. Indirect employment refers to Banking, Insurance, etc. although the WTTC does not specifically define these jobs.

<sup>15</sup> WTTC, Travel and Tourism: Economic Impact Saint Lucia, 2017 (Please note that data is not available to break down employment by tourism-related industry)

in tourism suffered in 2008 due to the global economic crisis and in 2016 due to a decline in cruise arrivals, and reductions in visitor expenditure, bed nights and the average length of stay. However, increased demand for Saint Lucia's tourism product from the United States (U.S.) and the Caribbean markets mitigated the diminished sector performance<sup>16</sup>. From all indicators examined, tourism will continue to be the primary economic driver for Saint Lucia for the next 20 years.

Tourism officials have projected an increase of 2,000 rooms more than the 2016 room stock figure over the next four years. This is in keeping with a steady increase in stayover arrivals averaging 14% per annum since 2010<sup>17</sup>. There is also the growing number of independent rooms in the sharing economy represented largely by "Airbnb" in Saint Lucia with approximately 20% of the total room-stock, many of which are not accounted for in the official statistics. The Caribbean Hotel and Tourism Association (CHTA) reported that Airbnb is forecasting a 17% year-to-year growth in visitors to Saint Lucia using its services.

Average occupancy rate currently stands at 66%, growing relatively steadily over the past six years. Saint Lucia and Antigua have the highest average daily rate (ADR) among the OECS destinations (US\$207 and US\$218 respectively). Saint Lucia has the third highest revenue per available room (RevPAR) (US\$120)<sup>18</sup>.

There are approximately 50 hotels in St Lucia<sup>19</sup>. The hotel sector in St Lucia is predominately made up of high-end hotels and luxury boutique hotels and has 4,702 rooms available as of July 2017. Of the total rooms available, 33% are part of a branded hotel: Sandals accounts for 19% of the hotel room stock. St Lucia has a mixed combination of hotel types but is dominated by all-Inclusive hotel packages<sup>20</sup>. Large hotels account for 72% of the room stock; followed by small hotels at 14%; villas and apartments at 10%; and guesthouses at 4%<sup>21</sup>.

Of the 1 million visitors in 2016, 347,872 were tourists, 12,483 were day trippers, 587,749 were cruise visitors and 56,268 were yachters. The Saint Lucia Tourism Benchmarking and Competitiveness Assessment (2013) sets an objective to increase arrivals and reach new records of 500,000 air arrivals; 76,000 yacht arrivals and a total of 1,150,000 total arrivals by 2022. Most tourists/stayover visitors arrive by air. There are two airports. The international airport on the south of the island providing a gateway for direct flights from major US cities like Atlanta, New York, Miami, Chicago, as well as from the London and Manchester in the United Kingdom. There are weekly charters out of Germany.

The US tourist market dominates with 45% of all tourist arrivals, followed by the Caribbean (19%) and United Kingdom (18.5%) with Canada in a distant fourth position with 11%. Germany, the rest of Europe and the rest of the World represent between 1% and 2% each.

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<sup>16</sup> SLU Social and Economic Review 2015-16, p.11

<sup>17</sup> SLTB Annual Trend Fact Sheet 1999-2016 (2010: 308,937/ 2016: 347,872)

<sup>18</sup> SLTB Research Officials report that "occupancy figures may in fact be higher as hotels tend not to report this accurately."

<sup>19</sup> <http://www.st-lucia-hotels.com/>

<sup>20</sup> Saint Lucia Tourism Benchmarking and Competitiveness Assessment, 2013

<sup>21</sup> SLTB Accommodation Breakdown - 2017

Saint Lucia is promoted as a weddings and honeymoon destination and has attracted international recognition consistently over the years and been named the “Caribbean’s Leading Honeymoon Destination 2017” by the World Travel Awards (WTA)<sup>22</sup>. Many of the larger resorts all include family vacations as a major component of their offerings.

The average length of stay in Saint Lucia is 9.1 nights, similar to most other Caribbean destinations, which has been growing over the last 10 years<sup>23</sup>. Airbnb have indicated that the company accounts for 7,000 guests to Saint Lucia per year, whose length of stay averaged 5.4 nights.

### 2.3. Voluntary Standards and Certification

Certification for the accommodation sector was implemented under Cricket World Cup (2007) incentives package but was not sustained after this. This included home accommodation which is most applicable to the growing Airbnb market. There are no St Lucia-based accreditation/certification systems for hotels or other tourism products, however the St Lucia Tourism Authority (SLTA) is planning to develop licencing/certification standards for all tourism sub-sectors, together with a ‘hospitality assured’ programme and policies for sports and water-based tourism.

Three hotels and one small hotel chain, Bay Gardens, are Green Globe members. Sandals has Earth Check certification, as well as Travelife Gold. Other smaller properties have pursued green certification, including many of the Soufriere boutique type properties.

The Ministry of Tourism directs policy and manages the incentives for the tourism development portfolio. There is no structured mechanism for integrating tourism approaches across government Ministries or departments, however, various inter-Ministerial advice on policy, research, legislation and project applications. Public awareness raising is coordinated through the Ministry of Educations. Business trade licenses advice and the processing of incentives is coordinated by the Ministry of Commerce.

The Ministry of Tourism is currently working with several other Ministries on cross Ministerial activities for example, with Ministry of Agriculture for the development of an Agro-tourism strategy; with the Ministry of Health for safety and security, and the National Conservation Authority (NCA) in the Ministry with responsibility for community development, for beach management and safety.

### 2.4. Climate Change- policy summary

The highest governmental body in charge of the climate change topic in Saint Lucia is the National Climate Change Committee (NCCC). The NCCC was established by the Cabinet of Ministers in 1998 and, after becoming inactive within a short time, was re-established in 1999 with the aim of providing advice and support for national climate change programmes and activities. The NCCC meets periodically to provide guidance on, and monitor the implementation of, national and regional climate change activities. The wide composition of

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<sup>22</sup> <http://www.stlucia.org/articles/archives/09-01-2017/10-01-2017/>

<sup>23</sup> SLTB Annual Trend Fact Sheet 1999-2016 (2010: 308,937/ 2016: 347,872)

the NCCC helps to facilitate mainstreaming of climate change issues at the sectoral level. In addition to the NCCC, climate change programming in Saint Lucia is coordinated by a climate Change team based in the Sustainable Development and Environment Division within the Ministry of Sustainable Development, Energy, Science & Technology (MSDEST). The Climate Change team reports to the Permanent Secretary of the MSDEST, who is the national focal point for the Convention. The Climate Change team is involved in the day-to-day coordination of the climate change issue and is also engaged in the implementation of climate-related activities on behalf of Government of Saint Lucia. The Climate Change team serves also as the secretariat for the NCCC.

Under the UNFCCC (United Nations Framework Convention on Climate Change framework), Saint Lucia submitted its INDC (Intended Nationally Determined Contribution) in November 2015 and ratified the Paris Agreement in April 2016. Together with the instrument of ratification, Saint Lucia submitted its first Nationally Determined Contribution (NDC), which content is similar to the INDC. The mitigation goal established by Saint Lucia in its NDC is a conditional target expressed as a reduction against the BAU emissions projections: 16% reduction by 2025 and 23% reduction by 2030. The NDCs covers the sectors energy, electricity generation and transport and identifies key intervention areas including energy efficiency in buildings; energy efficiency for appliances; use of geothermal, wind and solar energy sources in order to achieve 35% renewable energy target by 2025 and 50% by 2030; use of Efficient Vehicles. The NDC includes also adaptation as a priority for the country and identifies adaptation measures as a constitutional priority for the country.

In addition, Saint Lucia submitted its TNC (Third National Communication) to the UNFCCC in August 2017. Therefore it is the most up to date document prepared by the country and addressing climate change mitigation and adaptation. The document includes a chapter on "Measures to mitigate climate change" which analyses the key intervention areas already mentioned in the NDC and identifies specific mitigation actions as well as development benefits, emission reduction potential and barriers for all actions. Vulnerability and adaptation to climate change in the tourism sector are analysed and discussed in depth in the document. The document does not make an explicit link between climate change mitigation and tourism, though, in the mitigation chapter, the tourism sector is said to contribute significantly to energy consumption.

Saint Lucia has two policies related to climate changes adaptation, the National Climate Change Policy and Adaptation Plan and the Saint Lucia Climate Change Adaptation Policy. The *Saint Lucia* National Climate Change Policy and Adaptation Plan was published in 2002 by the Government.<sup>24</sup> The aim of Saint Lucia's National Climate Change Adaptation Policy is to foster and guide a national process of addressing the short, medium and long term effects of climate change in a co-ordinated, holistic and participatory manner in order to ensure that, to the greatest extent possible, the quality of life of the people of St. Lucia, and opportunities for sustainable development are not compromised. This policy shall guide the work of all Governmental, statutory, Non-governmental and Civic entities which are involved in, or which may seek to become involved in addressing Climate Change issues as they affect St. Lucia.

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<sup>24</sup> [http://www.caribbeanelections.com/eDocs/strategy/lc\\_strategy/lc\\_climate\\_change\\_policy.pdf](http://www.caribbeanelections.com/eDocs/strategy/lc_strategy/lc_climate_change_policy.pdf)



St. Lucia's Climate Change Adaptation Policy and Strategy is based on an acceptance that climate change is occurring and that it will continue to occur even if immediate steps are taken to reduce global warming. It is also accepted that the effects thereof are likely to have a profound, and in sum, adverse, impact on the economic, social, and environmental aspects of life in St. Lucia and other Small Island Developing States. This Policy and Strategy bears testimony to St. Lucia's commitment to confronting and addressing the challenges posed by the climate change phenomenon. Although a country of limited economic, financial and technological resources, we are prepared to adopt an integrated and coordinated approach to planning for, and ameliorating the effects of, climate change.

The Saint Lucia Climate Change Adaptation Policy (CCAP) was published in 2015<sup>25</sup>. The CCAP provides a framework for addressing the impacts of climate change, in an integrated manner, across all key sectors, including tourism sector. It recognises that "some activities provide both adaptation as well as mitigation, co-benefits, thereby increasing resilience in the face of existing and emerging climate change impacts. As such, adaptation and mitigation efforts can be mutually reinforcing."<sup>26</sup>

In addition to the policies specifically relevant to climate change, Saint Lucia also has a number of policies specifically relevant to the tourism sector as described below.

The [St Lucia Tourism Strategy and Action Plan](#) (2013) proposes a strategy where Saint Lucia, as a destination, will;

- Be more energy efficient and more climate sound (for example by using renewable energy);
- Make tourism businesses more sustainable, increase benefits to local communities and raise awareness and support for the sustainable use of natural resources; and
- Consume less water and minimize waste.

Other bodies who can influence the environmental impacts of tourism include [Invest Saint Lucia](#), a statutory agency that manages the investment portfolio for tourism as well as all other development options for Saint Lucia. It acts as a one stop shop for investors in the targeted areas of infrastructure, manufacturing and tourism.

Bodies promoting tourism include the [Saint Lucia Tourism Authority](#), responsible for product development and marketing, and the [Saint Lucia Hotel and Tourism Association](#), a non-profit membership organization that functions as the "official organization and national spokesperson" for the hospitality industry. It has a wide membership and is responsible for facilitating tourism sector development and management.

St Lucia has a range of environmental policies and strategies in place which influence the development of tourism. These include the [National Vision Plan](#) (2008) which sets out the long term development plan for the country, the Sustainable Energy Plan (2005) (which identified the need to enhance security of energy supply and use in all sectors of the

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<sup>25</sup> <http://www.climatechange.govt.lc/wp-content/uploads/2017/10/Climate-Change-Adaptation-Policy-2015.pdf>

<sup>26</sup> <http://www.climatechange.govt.lc/wp-content/uploads/2017/10/Climate-Change-Adaptation-Policy-2015.pdf>

economy), [National Energy Plan](#) (2010), [National Land Policy](#) (2007) and the [National Environmental Policy](#) (revised 2014). For national policies relating to Energy, Food and Beverage, Transport, Agriculture, and Waste please refer to the full national context report in **Annex A**.

### 3. General methodology on mapping of tourism value chains, hotspots analysis, data collection and processing

#### 3.1. Concepts and definitions

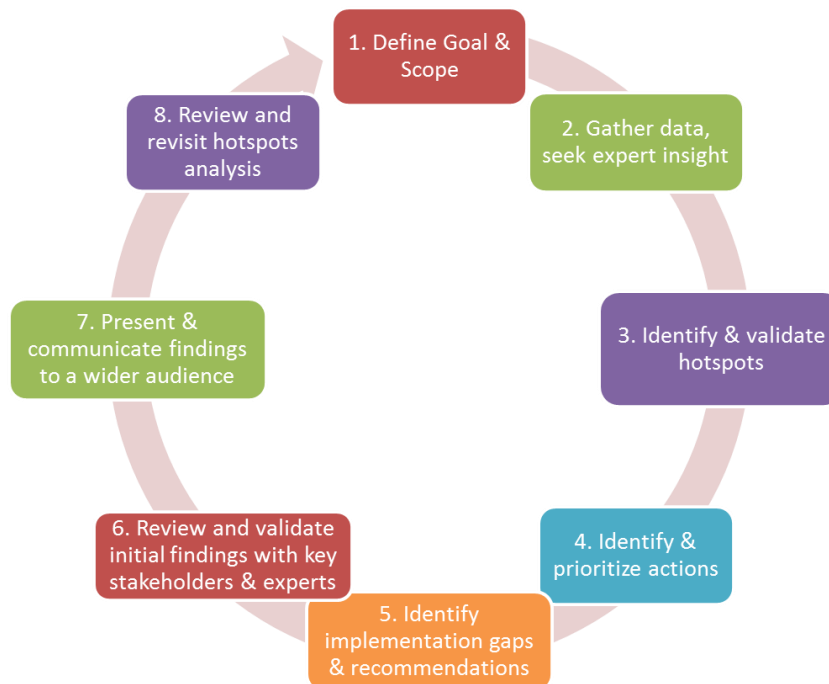
This project and report have followed the 2017 Life Cycle Initiative overarching methodological framework for hotspots analysis<sup>27</sup>. This allows for the rapid assimilation and analysis of a range of information sources, including life cycle based and market information, scientific research, expert opinion and stakeholder concerns. The outputs from this analysis can then be used to identify potential solutions and prioritize actions around the most significant governance, economic, environmental and/or social sustainability impacts or benefits associated with a specific country, city, industry sector, lifestyle, product portfolio, product category or individual product or service.

The Life Cycle Initiative (2017) identifies that hotspots may be defined in two ways. Firstly, a hotspot may be a life cycle stage (such as material sourcing, processing, manufacturing, transport, retail, use and disposal) whose contribution to the impact category (such as global warming potential) is greater than even distribution of that impact across the life cycle stages. For example, if five life cycle stages are defined, a hotspot should be at least 20% of the impact category. Secondly, hotspots may be all life cycle stages collectively contributing more than 50% to any impact category, ensuring that most of the impact is considered. In this project, the second approach is taken to ensure that the impact of data uncertainty on addressing hotspots is minimised.

Hotspots analysis comprises 8 stages, as illustrated in **Figure 1** below.

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<sup>27</sup> <http://www.lifecycleinitiative.org/new-hotspots-analysis-methodological-framework-and-guidance/>



**Figure 1: 8 Stages of Hotspots Analysis**

The goal and scope, are established in the introductory section of this report. The remainder of this report goes through to step 7 of the hotspots analysis framework.

### 3.2. Value Chain Mapping (System Boundary)

The project has adopted the definition contained in the second committee draft of ISO14001: “the entire sequence of activities or parties that provide or receive value in the form of products or services (e.g. suppliers, outsources workers, contractors, investors, R&D, customers, consumers, members)”<sup>28</sup>. **Figure 2** below further illustrates this definition noting how there are stakeholders that are not necessarily part of the supply chain, but that perceive social, economic and environmental value and impacts from the series of activities required to deliver a product or service.

Mapping and managing value chain is all about extending line of sight and influence beyond the traditional areas of focus and looking to limit risk and add value at each stage. It looks both upstream to the suppliers and materials, and downstream to the customers and reuse/disposal, to identify key risks and opportunities for business.

<sup>28</sup> ISO14001 CD2, 2013, in UNEP and DTU (2017) Eco-Innovation Manual <http://unep.ecoinnovation.org/>



**Figure 2: The difference between supply chain and value chain**

Clear boundaries are essential to ensure that appropriate information is obtained and used within the analysis. Whereas a supply chain includes the activities of all parties involved in fulfilling a customer request, such as a product or service, a value chain also includes the customer themselves and the impact of subsequent waste. The value chain map for hotels and restaurants in St Lucia is shown in **Figure 3**. This identifies the activities and actors involved in the provision of tourism services all of which are within the scope of the project.

A value chain approach will provide the 'big picture' that should guide the activities to be taken within the value chain based on the identification of hotspots, threats, and opportunities. It will help decide where partnerships need to be established, what type of collaboration is required from stakeholders, identify clients to target with services, or what changes are required to meet clients' expectations.

There are no accurate figures of expenditure for different sub-sectors and value chains supporting the tourism sector in Saint Lucia, as the Saint Lucia Tourism Authority (SLTA) does not have access to a Tourism Satellite Accounting (TSA) tool, as is the case in other countries.

Whilst **Figure 4** below, highlights the value chain actors most able to control or influence the environmental hotspots identified in this report. Based on the literature review and hotspots on nearby islands, electricity gas and water, waste management, agriculture and food and beverages appear to represent the hotspots for GHG emissions associated with hotels and restaurants. The high proportion of imports suggests that many of these impacts occur overseas.

Meat and dairy products and fresh produce are also a hotspot in terms of water use, whilst transportation and electricity use on site are likely to be the energy hotspots for tourism, hotels and restaurants. As with GHG emissions, most of the water impact occurs overseas, with most of the energy associated with hotels used directly within the hotels in St Lucia.

The Ministry of Commerce and the Bureau of Standards have responsibility for managing and regulating the food and beverage sector. Massy Stores is by far the largest and most dominant

supplier of food on the island. However, the Sandals chain has set up a subsidiary company to provide food and beverage to the accommodation and restaurant sector. Some small enterprises have collaborated to meet tourism needs, forming cooperatives to supply the hotel sector. However, volumes and number of contracts are unknown. At present no information is available on the import of food, goods and consumables into country for the tourism sector specifically.

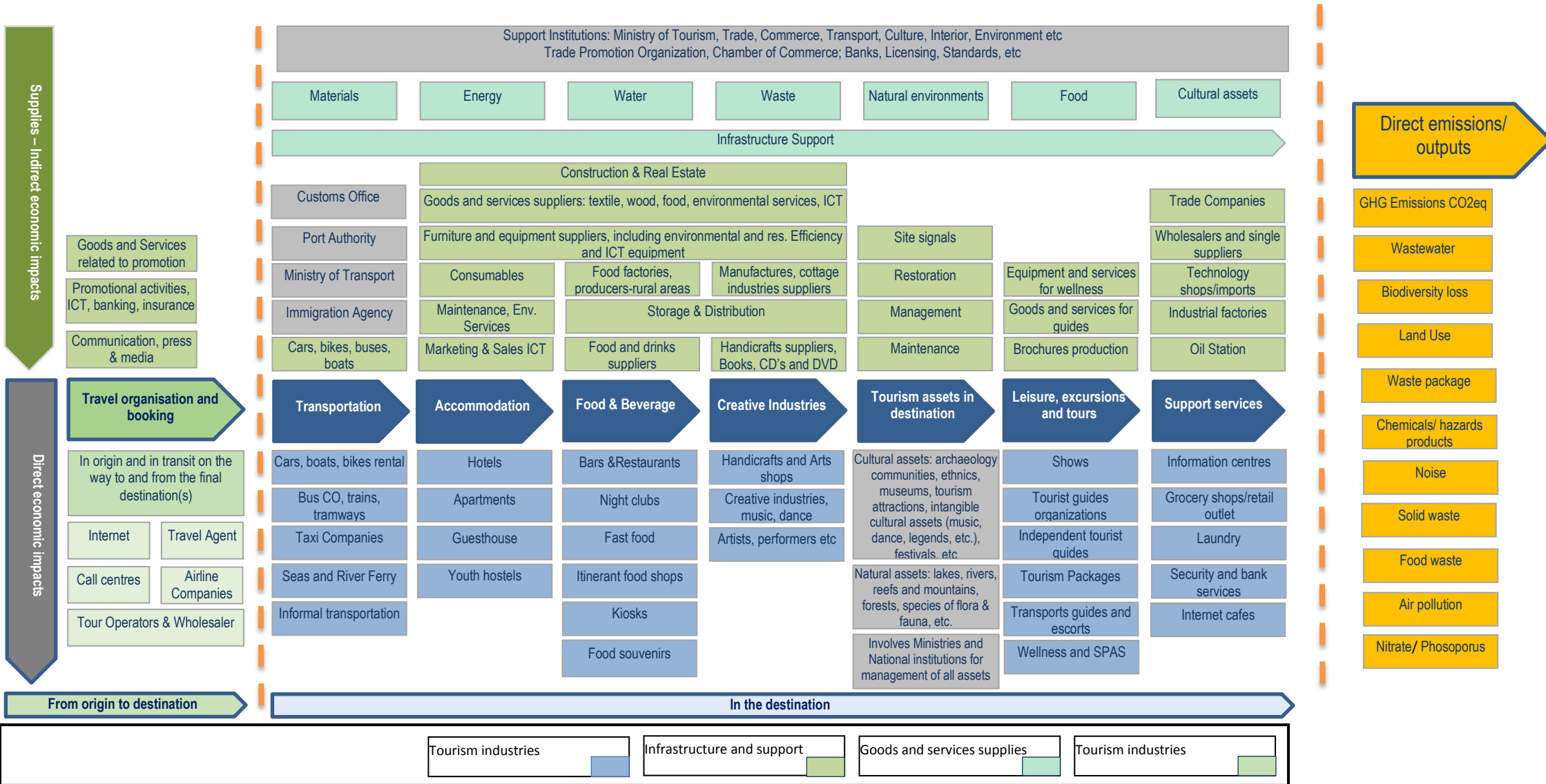
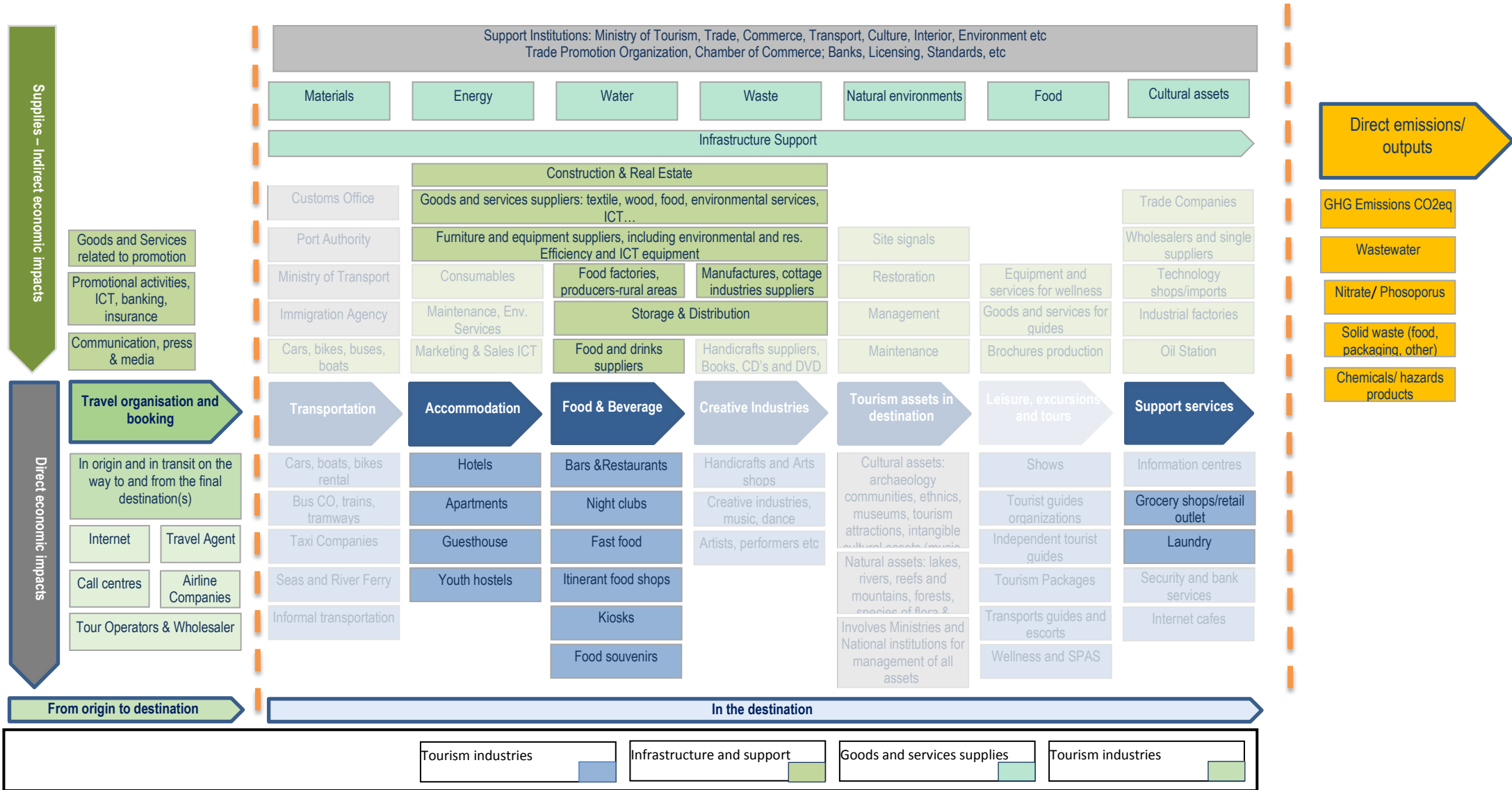


Figure 3: Value chain map for hotels and restaurants in Saint Lucia. Adapted by UN Environment from ITC WTO (2015)

Figure 4: Value Chain actors able to control / influence environmental hotspots



## 4. Identification of Hotspots

### 4.1. Introduction

This section provides information on the methodologies and processes used to collect data to inform the hotspots analysis for tourism value chains in Saint Lucia. It starts by providing a summary of the two approaches taken, the methodologies used and the key findings from each. This is followed by a short discussion of the inherent data limitations in both approaches; and how proxy data was used in the top-down approach (as no national-level data was available for Saint Lucia); and supplemental research was required to sense check the top-down view of environmental hotspots, in order to address a significant data gap that resulted from a lack of bottom-up hotel survey data. Finally, an analysis of imported goods was conducted to check their significance and any implications for the hotspots analysis.

Two approaches have been taken to gathering data and identifying hotspots. The first approach has been to gather data at a national level (a top-down approach) relevant to the goal and scope of the study, and the second to collect data from individual organisations in the Saint Lucia tourism sector (a bottom-up approach). WRAP have previously combined these two approaches to validate data on the environmental impacts of food waste ([WRAP 2016](#)). This can provide more confidence in the robustness of conclusions drawn from the hotspots analysis.

The top-down approach offers a rapid way of approximating the greenhouse gas emissions, energy use and water footprint associated with the tourism value chain using national statistics collated in a consistent manner. The bottom-up approach gathers data through a survey of individual hotels to identify data at a greater degree of resolution where it is available and compare this to the national data. Where common themes are able to be identified, this gives greater confidence in the results of the hotspot analysis.

The two approaches, how they have been used and the findings from each are included in the following sections of the report.

### 4.2. Top-down Approach and Results

The top down approach builds on the work of Lenzen et al<sup>29</sup> to construct the EORA database. The Eora multi-region input-output table (MRIO) database provides a time series of Input Output tables with matching environmental and social satellite accounts for over 180 countries. Input Output tables provide data regarding the economic spending of sectors within an economy in other sectors, and the economic output that results. In short, these tables can tell us how much is spent in all sectors of the economy (inputs) to produce one US\$ of value in each sector (output). Using this data, we can calculate the cascade effect of spending within an economy. For example, \$1 spent in the electricity sector requires the electricity sector to spend a given fraction of a dollar on fuels etc. and so on.

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<sup>29</sup> Lenzen, M., Kanemoto, K., Moran, D., Geschke, A. Mapping the Structure of the World Economy (2012). *Env. Sci. Tech.* 46(15) pp 8374-8381. [DOI:10.1021/es300171x](https://doi.org/10.1021/es300171x)  
Lenzen, M., Moran, D., Kanemoto, K., Geschke, A. (2013) Building Eora: A Global Multi-regional Input-Output Database at High Country and Sector Resolution, *Economic Systems Research*, 25:1, 20-49, [DOI:10.1080/09535314.2013.769938](https://doi.org/10.1080/09535314.2013.769938)



Where the total environmental impact of a sector, and its total economic output for a given year, are known, the environmental impact per dollar of economic output for each sector can be calculated. At a high level, this allows the direct and indirect environmental impact of spending in a given sector to be calculated. The raw data is drawn from the UN's System of National Accounts and COMTRADE databases, Eurostat, IDE/JETRO, and numerous national agencies. By mapping the economic interactions of hotels and restaurants with other sectors of the economy, the impact incurred through expenditure by hotels and restaurants can be identified and quantified.

As noted above and in the section on 'Data Limitations' below, no national-level data was available for Saint Lucia, so top-down modelling for the country was not possible. However, data from three other Caribbean islands of varying size (Antigua, the British Virgin Islands and the Dominican Republic) and with hotels and restaurants forming one category was used as a proxy to help understand where and what environmental hotspots might exist in the tourism sector in Saint Lucia. A more detailed discussion of the findings from the top down analysis of national-level data from these three islands can be found in **Section 4.4** on 'Data Limitations' below.

### 4.3. Bottom-up approach and Results

The bottom-up approach is based on a survey of individual hotels in the tourism value chain. The strength of the bottom-up approach is usually the high level of detail and the traceability due to high transparency. The approach can also allow for the inclusion of additional products which may not be identifiable through national data (e.g. non-apparel and apparel textiles), which can provide more guidance on potential interventions where these relate to a hotspot.

In addition, the bottom up data will include imported products, and the significance of these can then be considered when interpreting the national, top-down data to assess its suitability in the identification and prioritisation of hotspots. A weakness of this approach is the time required to gather data, whether that data is available; and the need to convert it into consistent units and the heterogeneity of the sector, which means that the hotspots identified may vary from one hotel to another. This may mean that a large sample is required to obtain an indication of hotspots which can be considered representative of the sector as a whole and suitable for comparison. The degree of alignment between bottom up data sets is usually assessed and commented upon before drawing any conclusions.

The survey used in the bottom-up approach can be found in **Annex B**. It covers a range of topics, however for the purposes of the pilots the purchasing data for hotels was crucial to enable WRAP to complete the hotspots analysis. The survey was administered by the in-country partners in St Lucia who surveyed 12 hotels. The survey was anonymised to ensure co-operation from hotels surveyed and is reported in this format for the purposes of this report.

The survey questions include data required for the UN Environment (2017) [Recommended key environmental indicators for the tourism private sector](#). The indicators which most closely align to hotspots are reviewed in **Section 8**.

Completed surveys were entered into WRAPs hotspots tool. This is a Life Cycle Assessment based tool which contains regionalised life cycle data for over 70 products utilised by hotels and restaurants in St Lucia. The tool has previously been used in a range of peer-reviewed projects including WRAP (2013)<sup>30</sup> and is currently used with signatories to voluntary agreements facilitated by WRAP in the UK. For the current project, these products are aggregated to the level at which participating organisations can provide data (e.g. bananas, coconuts and pineapples are assessed as ‘fruit’). The range of products and services has been expanded to cover electricity, textiles, furniture, chemicals and glassware, based on feedback on what hotels are able to provide, and the data for electricity has been tailored to the country. Once data on the quantity purchased has been entered, the GHG emissions, water, waste and energy associated with that product can usually be identified in total and by life cycle stage. This allows specific products to be prioritised and key life cycle stages identified in line with **Section 3**.

Analysis at a hotel level was challenging due to the level of data required to input into the WRAP hotspots tool. This information is usually largely extracted from the accounts departments of participating hotels. The accounts departments, generally, were not prepared to prioritise the acquisition of this information in the timeframes required by the project, thereby resulting in either incomplete survey returns or significant delays in the submission of completed surveys. As a result, WRAP was only able to include a complete analysis of the hotel level hotspots analysis for one (1) hotel; although more hotels were able to provide information on some of their environmental hotspots. This information was also used to help identify hotspots in the bottom-up analysis. Further information gathered from the survey of hotels can be found in **Section 5** below.

#### 4.4. Data limitations

A top down approach has a number of strengths and weaknesses. By capturing all data from a sector (e.g. food and drink manufacturing), a top-down approach allows a comprehensive view of the impacts of a system. However, it is constrained by the availability of data in a suitable format. For example, data may be available for the sector “accommodation”, or for “accommodation and restaurants”, which will lead to results which cannot be used to benchmark the results of a tourism value chain with that in other countries. Inferences and assumptions are also required to sub-divide activities (e.g. imports) to identify the relevant emissions.

As noted above, national-level data is not available for St Lucia to allow top-down modelling. However, it is available for several other Caribbean islands of varying sizes, with hotels and restaurants forming one category. Three of these are presented in

Figure 5 and **Figure 6**, for consideration as proxies for St Lucia.

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<sup>30</sup> WRAP (2013) An initial assessment of the environmental impact of grocery products  
[http://www.wrap.org.uk/sites/files/wrap/An%20initial%20assessment%20of%20the%20environmental%20impact%20of%20grocery%20products%20final\\_0.pdf](http://www.wrap.org.uk/sites/files/wrap/An%20initial%20assessment%20of%20the%20environmental%20impact%20of%20grocery%20products%20final_0.pdf)

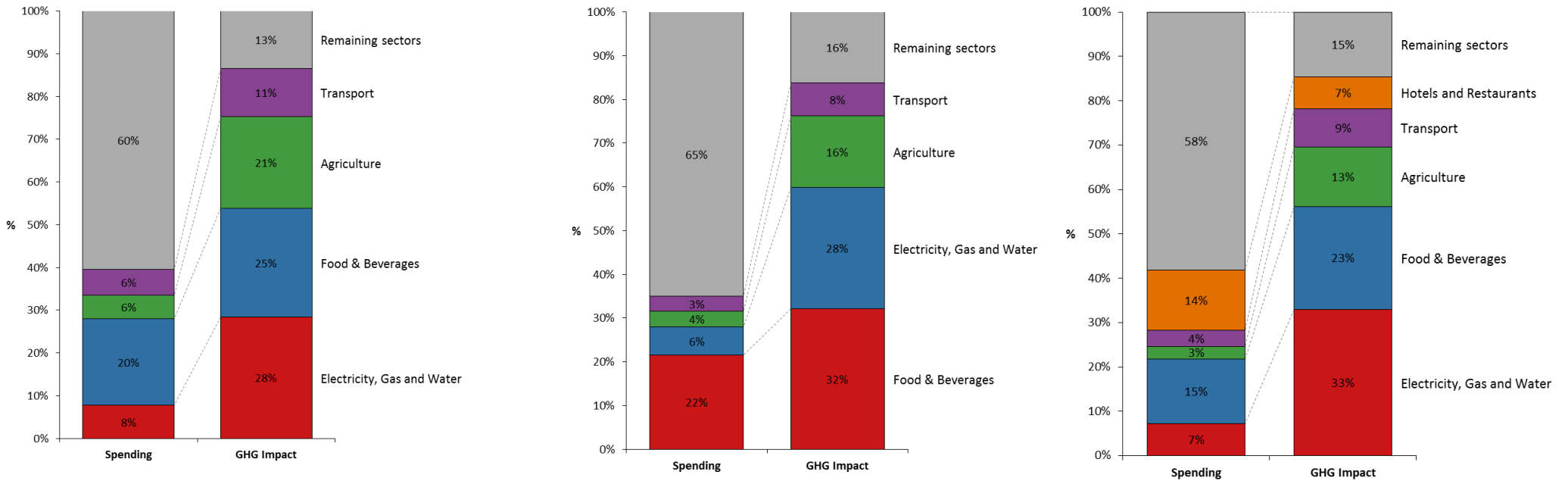
Figure 5 shows that despite comprising around one third of sector spend, food and beverages, electricity, gas and water contribute around three quarters of the greenhouse gas emissions for comparable islands. The figure highlights that the level of data disaggregation available is very low, with “food and beverages” available as only one category, with fishing and agriculture are shown as separate categories. Combined, these three categories comprise approximately 50% of the greenhouse gas emissions associated with hotels and restaurants in Antigua and the British Virgin Islands, and 40% in Dominican Republic. Within the Dominican Republic there is also some intra-sector expenditure which will also include food and beverages.

**Figure 6** shows that food and beverage and agriculture account for almost all the water footprint of hotels and restaurants in Antigua, British Virgin Islands and the Dominican Republic.

It is important to note that this top-down approach excludes the impact of imports and therefore does not capture all impacts within the system boundary. For Antigua, this means that 34% of expenditure is not accounted for, while for the British Virgin Islands and the Dominican Republic, 28% and 10% respectively, are not covered. Despite the close alignment in hotspots, there is therefore potential for a significant proportion of the environmental impact to be excluded through this approach. The effect of this on the identification of hotspots is assessed by comparing the results against the bottom-up data, and sense checking the importance of imports through other data sets.

The first alternative data set is data collected directly from hotels in St Lucia. In a business context, financial/economic data are usually easier to come by, and better understood by stakeholders, than material flow data that is usually required for Life Cycle Assessment. If the distribution of spending for a particular hotel is known, the same spreadsheet can be used to calculate the hotel-specific hotspots. However, as noted above, in the case of Saint Lucia, only one of the hotels surveyed was able to return a fully completed survey response, making it very difficult to draw any detailed, representative conclusions from the bottom-up analysis.

Therefore, for St Lucia, the proxy data from other Caribbean islands is sense checked against a range of national statistics and reports.



**Figure 5: Expenditure and greenhouse gas emissions for hotels and restaurants in Antigua, British Virgin Islands and Dominican Republic (left to right) Data source: Environmentally Extended Input Output tables: Eora Version 199.82, 2013 data (<http://www.worldmrio.com/>).**

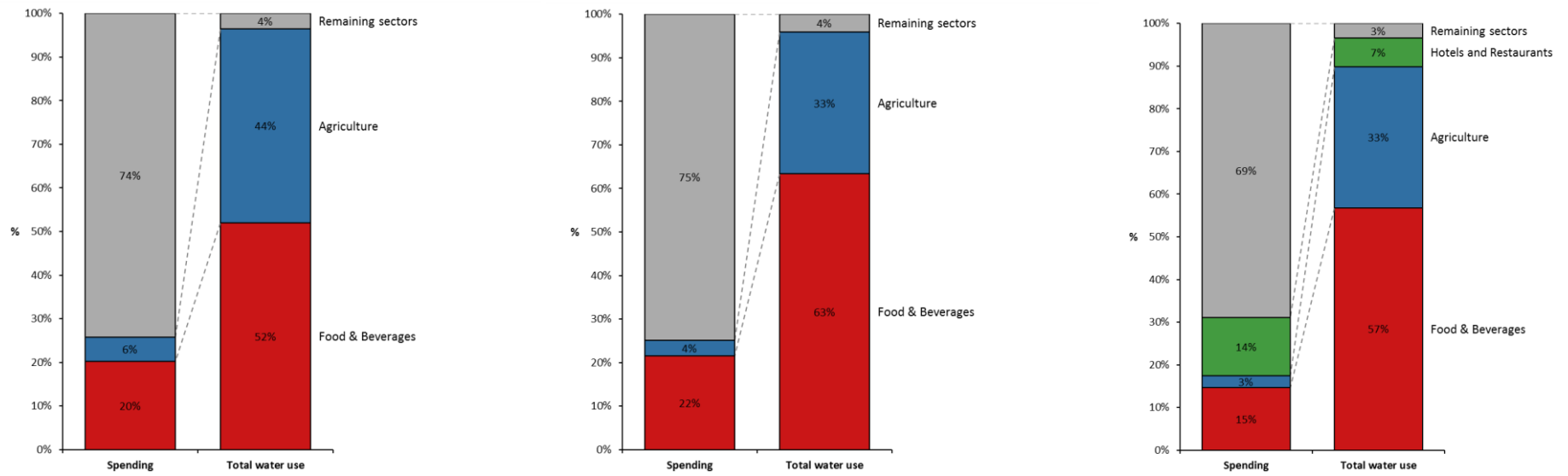


Figure 6: Expenditure and water footprint for hotels and restaurants in Antigua, British Virgin Islands, and Dominican Republic (left to right) Data source: Environmentally Extended Input Output tables: Eora Version 199.82, 2013 data (<http://www.worldmrio.com/>).



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based on a decision of the German Bundestag

#### 4.5. Implications of imported goods on the hotspots analysis

[FAOstat](#) suggests that Saint Lucia imports approximately 60-65% of food and beverages by weight. Although there are annual fluctuations, the proportion of food and beverages imported is relatively stable over time within this range. The most significant imported produce for 2013 are shown in **Table 2** below. It should be noted that wheat is not produced on St Lucia and milk and poultry meat are only produced in small quantities. The most significant domestic production is of bananas (15,000 tonnes)<sup>31</sup>, beer (14,000 tonnes), coconuts (14,000 tonnes) and fruit, other, (7,000 tonnes). 2013 data has been selected as this is the year for which top-down data is available for comparison with the bottom up data. This suggests that the hotspots identified through national data could underestimate the importance of goods and services procured by hotels, such as wheat and maize products. However, comparison with the survey data validates the hotspots identified through national data, suggesting that little additional work is required to fill this gap. This will be discussed further in review of specific indicators and survey responses.

Most imported products by weight	
Product	Quantity (000 tonnes)
<b>Wheat and products</b>	<b>18</b>
<b>Milk excluding butter</b>	<b>13</b>
<b>Poultry Meat</b>	<b>12</b>
<b>Bananas</b>	<b>9</b>
<b>Sugar (Raw Equivalent)</b>	<b>6</b>

**Table 2: Most imported products, 2013 (Source: FAOStat)**

<sup>31</sup> NOTE: our local partners have advised that banana production has experienced a pattern of continuous decline since the mid-1990's as a result of increased incidences of tropical cyclones, which without exception negatively impact banana farms, and have prevented impacted farms from recovering, especially over the past 10 to 15 years. This may explain why the volume of imported bananas has increased over time (see **Table 2** above).

## 5. National Baseline for the Environmental Impacts of the Tourism Value Chain

The top-down analysis provides information on the environmental impacts which occur within a country. For different indicators, these are commonly referred to as production-based, territorial, national or domestic impacts.

**Greenhouse Gas Emissions** Saint Lucia (2015) [Intended Nationally Determined Contribution Under The United Nations Framework Convention On Climate Change](#) states that in 2010 GHG emissions were reported as 0.524 million tonnes CO<sub>2</sub>eq. However, [Climate Links](#) suggest this is an underestimate, with emissions for 2011 put at 1.12 million tonnes CO<sub>2</sub>eq

By comparing the data from Lenzen et al (2012, 2013) with national data for Antigua, British Virgin Islands and the Dominican Republic via the World Resources Institute Climate Analysis Indicators Tool ([WRI CAIT](#)), it is possible to estimate the proportion of national greenhouse gas emissions associated with tourism, excluding international aviation. These are, respectively, 10%, 12% and 17%. It is therefore likely that greenhouse gas emissions associated with tourism in St Lucia are also significant at a national level.

GHG emissions hotspots are associated with **electricity production** for hotels and restaurants directly, and within their supply chains of **food and beverages (including agriculture)**. Scope 3 greenhouse gas emissions associated with rearing animals for meat and dairy products (enteric fermentation, manure) are anticipated to be a significant source of GHG emissions associated with hotels and restaurants.

**Water** - Over 96% of the water associated with hotels is considered as scope 3 for Antigua, British Virgin Islands, the Dominican Republic, and other countries considered as part of the Transforming Tourism Value Chains project. Most of this is associated with agriculture, food and beverages. [Yang et al \(2011\)](#), [Hadjikakou et al \(2013\)](#), [Cazarro et al \(2014\)](#) and [Zhang et al \(2017\)](#) find that tourist demand for food dominates the water footprint of tourism in a range of countries, with treatment of sewage from hotels also important. There is no reason to assume that St Lucia differs to these.

[Mekonnen and Hoekstra \(2011\)](#) National Water Footprint Accounts suggest that over 91% of the water footprint of St Lucia is overseas, with 21.5Mm<sup>3</sup> within St Lucia and 224Mm<sup>3</sup> overseas. Of the 21.5 Mm<sup>3</sup>, 12.6Mm<sup>3</sup> is for municipal / industrial use and the remainder is agriculture. Of the 224 Mm<sup>3</sup> overseas, 217Mm<sup>3</sup> is associated with consumption of agricultural products and the remainder industrial products. [UNEP \(2016\)](#) identify that hotels account for 10% of water withdrawals for municipal / industrial use, suggesting that hotels directly account for 1.2 Mm<sup>3</sup> of water p.a.

**Energy** – The [Inter-American Development Bank \(2015\)](#) identify that in 2013, LUCULEC, the sole electricity provider, sold 334GWh electricity to all users, of which 58% was to the commercial sector. In 2007, the last year for which sub-sector figures are available, hotels accounted for 61 GWh out of a total of 168 GWh of electricity sales to the commercial sector, equivalent to 20% of all electricity sales. The Bank identify that “due to the continued expansion of the hotel sector and its above-average consumption pattern, its importance as a consumer of electricity is likely to have further increased since 2007”. The Bank also identify

that official statistics for electricity consumption may under-represent consumption associated with tourism as “hotels in Saint Lucia operate significant self-generation capacity”.

Like most of the OECS, the island is a net importer of fossil fuels, with estimates indicating that nearly 98% of total energy supply is presently provided by LUCELEC. The remaining percentage corresponds to some renewables.

For Antigua, British Virgin Islands and the Dominican Republic, most energy for hotels is used in electricity generation, which accounts for nearly 55-57% of energy use. Given the information from the Inter-American Development Bank (2015), it seems likely that electricity use in hotels in St Lucia will also be a hotspot for energy. 98% of electricity is derived from imported oil, with 2% from combustible renewables and waste.

The Ministry of Infrastructure, Ports, Energy and Labour has responsibility for energy regulation, whilst the Department of Sustainable Development, has responsibility for renewable energy development. Energy regulation is the purview of the National Utility Regulatory Authority, which became law in early 2016. LUCELEC retains the monopoly in transmission and distribution, supplying just over 60,000 consumers.

In 1999, the Cabinet Conclusion N<sup>o</sup> 464 eliminated all import duties and consumption taxes on renewable energy technologies. In 2010 Saint Lucia finalized its energy policy which governs the sector. A key feature of the policy is the provision for independent power production for renewable energy. In 2012, Saint Lucia committed to increase the contribution of renewable energy to the national energy supply by 20% by 2020; support the development of indigenous energy sources and reduce the consumption of electricity in the public sector by 20% by 2020. In 2015, energized by the progress made in preparing for the renewable energy transition, the then Prime Minister announced his intension to reach 30% renewable energy by 2020. The amended Electricity Supply Act will allow for independent suppliers. Perhaps the largest of these would be in the area of geothermal where the Government has identified a “developer of choice” in the company ORMAT, for the development of this resource with the intent to supply 30 MW of base load to LUCELEC.

The transportation sector is the highest single user of energy in Saint Lucia<sup>32</sup>, whether in transportation and distribution of food products, particularly for imported goods (Saint Lucia imports 60-65% of the food it uses in tourism); or from tourists participating in tours, excursions or using taxis and hire cars. So tourism-related transportation is likely to be a significant energy hotspot in Saint Lucia.

Based on the proxy data for from three other Caribbean islands of varying size (Antigua, the British Virgin Islands and the Dominican Republic), it is likely that energy hotspots relating to the production, processing, manufacture, preparation and cooking of food (in particular for meat and poultry products and fresh produce) exist in the Saint Lucia tourism sector.

**Waste** – The Saint Lucia Solid Waste Management Authority (SLSWMA) collects data on waste based on regional origin and disposal, but only disaggregates for the hotel sector not accounting for the restaurants. Restaurant waste is accounted for under commercial. Whilst overall national waste collection and disposal declined for the period 2014-2015, [SLSWMA \(2016\)](#) shows that the hotel sector recorded an increase of 316 tonnes to 6,398 tonnes (5%

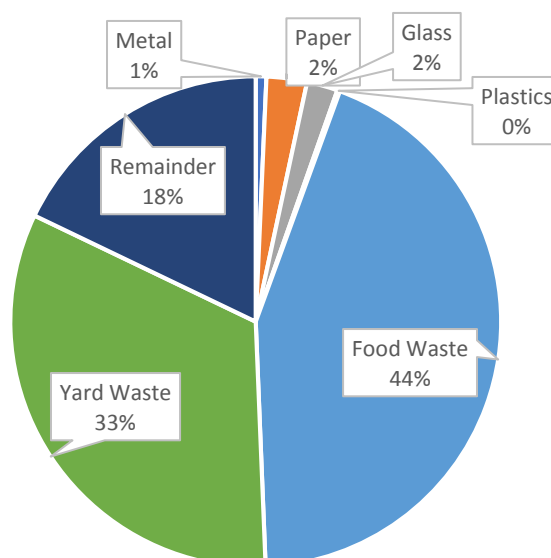
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<sup>32</sup> SLU Economic and Social Review 2014-2015.



over previous year) representing 9% of total national waste collected and disposed. SLSWMA also identify that although national waste disposal has been decreasing by 3% per annum since 2010/11, highlighting the growing significance of waste from hotels.

Of the six (6) hotels who provided information on waste arisings through the survey, none could provide a composition for the waste, though one did indicate that 50% of waste was organic (predominantly food waste) and 50% non-organic. The composition of hotel waste is therefore estimated based on [Dowling et al \(1999\)](#). This is shown in **Figure 7** below and highlights the importance of organic wastes, and in particular food waste.



**Figure 7: Composition of Hotel Waste in St Lucia (1999)**

The data collected through a survey of hotels has been cross-checked with purchasing data to give an apparent rate of waste generation. This has then been benchmarked with typical practice based on WRAPs previous activities in the UK which suggests an average wastage rate of 20%<sup>33</sup>. For the one hotel able to provide this data, this shows that 41% of food is wasted. As this is only one result it is not possible to extrapolate impact to a national level at this time. Nonetheless it does suggest that waste from hotels is a significant issue.

WU (2014): [Global Material Flows Database](#) suggests that unused food accounts for 65 000 tonnes of waste in 2013, 98% of wasted biomass in Saint Lucia. This is equivalent to 54% of biomass harvested for food, suggesting significant opportunities for efficiency gains.

Data for the example hotel which provided sufficient data are presented in **Figure 8**. These show the contribution of the hotel to greenhouse gas emissions, water, and waste. No data on energy consumption was provided. The findings are consistent with the national analysis, confirming the importance of animal products across the environmental impacts considered, and highlighting the importance of beverages. Although general hotspots can be identified using national data, there may be hotel-specific variations and so on its own this hotel should not be considered as validation of the estimates made from other Caribbean islands.

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<http://www.wrap.org.uk/sites/files/wrap/Overview%20of%20Waste%20in%20the%20UK%20Hospitality%20and%20Food%20Service%20Sector%20FINAL.pdf>

However, in combination with other national data sets this appears to confirm the importance of food and beverages.

## Value Chain Map - St Lucia Hotels



Input sales in yellow      Use arrows to sort largest to smallest impacts. Grey cells denote where no impact data is

Level 2	Product Mass (tonnes unless otherwise stated)	GHG Emissions (tCO2e)	Energy (GJ)	Total Water Footprint (million litres)	Total Waste and By-Product Footprint (tonnes)
Alcoholic Beverages	66	194	1.89	48	5
Meat	3	105	0.15	25	1
Non-Alcoholic Beverage	79	77	0.56	6	7
Poultry	11	55	0.48	27	5
Groceries	16	49	0.24	11	3
Fish & seafood	9	34	1.06	5	2
Grain and Cereals	6	22	0.15	13	1
Vegetables	10	19	0.14	3	2
Fruit	12	13	0.11	5	3
Dairy	1	3	0.01	4	0
Electricity (kWh)				#N/A	#N/A
Textiles					
Glassware					
Water (m3)	24,627		#N/A	25	#N/A
Electrical Equipment			#N/A	#N/A	#N/A
Pork					
Local Produce					
Chemicals					
Furniture			#N/A	#N/A	#N/A

Figure 8: Data from one (1) hotel showing contribution to greenhouse gas emissions, water, waste and energy consumption.

## 6. Summary of Environmental Hotspots

**Table 3** below summarises the environmental impact hotspots for the tourism sector in Saint Lucia by environmental impact category/indicator. Organisations who can influence or control hotspots are identified in **Figure 4** above.

Hotspots in the table have been selected based on the guidance provided in UN Environment’s methodological framework for hotspots analysis; and therefore reflect the most important hotspots for the tourism sector in Saint Lucia based on the importance and magnitude (the size and location of the hotspots for one or more impact categories); and the ability of hotels, restaurants and their value chains and other stakeholders (e.g. local and national government, utilities companies) to address them.

**Table 3: Summary of hotspots across environmental impact categories for Saint Lucia**

Summary of hotspots across environmental impact categories – Saint Lucia				
Rank	GHG	Energy	Water	Waste
1	<b>Primary production of meat and dairy products:</b> GHG emissions from the rearing of livestock for meat and dairy products (e.g. methane emitted through bovine enteric fermentation (digestion) and production of manures) are likely to be significant hotspots for hotels and restaurants in the tourism sector. Saint Lucia produces very little milk and poultry products, so the bulk of these products are imported, requiring engagement and collaboration with overseas suppliers.	<b>Transportation:</b> the transportation sector is the highest single user of energy in Saint Lucia <sup>34</sup> , whether in transportation and distribution of food products, particularly for imported goods; or from tourists participating in tours, excursions or using taxis and hire cars.	<b>Primary production of animal feed and livestock:</b> water use in feed production (including irrigation water) and for livestock (drinking and cleaning water).	<b>Food waste in hotels and restaurants:</b> WRAP estimates an average of 7-12% meat waste and 20% of edible vegetable parts are wasted in hotel kitchens and by customers, with one hotel survey return indicating overall food waste levels of 41%. Solid waste from hotels has been rising at a rate of 5% a year since 2008 <sup>35</sup> . Additionally, the lack of private and public-sector infrastructure for collection and treatment of food/organic waste leads to wasted resource and high methane emissions from open, landfill sites

<sup>34</sup> SLU Economic and Social Review 2014-2015.

<sup>35</sup> The Saint Lucia Solid Waste Management Authority Annual Report 2014-15.

Summary of hotspots across environmental impact categories – Saint Lucia				
Rank	GHG	Energy	Water	Waste
2	<b>Direct Electricity and fuel use in hotel and MICE establishments:</b> lighting, heating, ventilation and air conditioning (HVAC) of rooms, public spaces, back of house areas. In 2007, hotels in Saint Lucia accounted for 20% of the commercial sectors energy demand <sup>36</sup> . Energy audits in most Caribbean hotels identify HVAC as a major contributor to energy costs, accounting for up to 30% of total energy use. In order to deliver Saint Lucia’s Nationally Determined Contribution (NDC) targets under the Paris Agreement (November 2015), energy efficiency measures need to displace 11% of its energy generation needs by 2025.		<b>Direct water use in hotels and restaurants:</b> guest washing and sanitation, cleaning of rooms and public spaces, laundry services, food preparation and cooking, irrigation of grounds, swimming pools and the treatment of waste water and sewage by hotels are all likely to be significant uses of water in the Saint Lucia tourism sector <sup>37</sup> .	<b>Primary production of fresh produce:</b> in-field, unharvested crops and immediate post-harvest crop waste due to supply chain quality requirements and poor demand forecasting (estimates are up to 20% losses/waste).
3	<b>Primary production of fresh produce:</b> emissions from use of fertilizers and methane emissions from organic wastes. Fuel use for in-field operations. NOTE: Saint Lucia produces some fresh produce domestically, particularly bananas (15,000 tonnes), coconuts (14,000 tonnes), and some other fruits (7,000 tonnes) but imports between 60-65% by weight of the food and beverage products required for the tourism sector each year.	<b>Processing and manufacturing of meat and poultry products:</b> slaughterhouse processing and energy used in chilled storage and refrigeration contributes to post-farm gate emissions. NOTE: the vast majority of meat is imported into Saint Lucia.	<b>Primary production of produce and beer:</b> water used to grow fruit, vegetables and other food crops is likely to dominate water use across the life cycle based on proxy data for the tourism sector in three other Caribbean islands <sup>38</sup> . 14,000 tonnes of beer is produced domestically in Saint Lucia, representing another likely significant use of water in the brewing process.	<b>Direct solid waste generation in hotels and restaurants,</b> leading to lost resources to the national economy as a result of no recycling infrastructure: according to the Saint Lucia Solid Waste Management Authority (SLSWMA) hotel waste has been rising at a rate of 5% a year since 2008. Hotels account for 9% of national waste arisings and no separate figures are available for restaurants as they are aggregated with all forms of commercial waste <sup>39</sup> . The latest publicly available statistics (April 2014-March 2015) suggest that all wastes at that time (71,899 tonnes) were landfilled at the island’s two landfill sites and no materials are separated or recycled.

<sup>36</sup> Source: The [Inter-American Development Bank \(2015\)](#). NOTE: for Antigua, British Virgin Islands and the Dominican Republic, the largest use of energy for hotels is using electricity, which accounts for 55-57% of energy use. Given the information from the Inter-American Development Bank (2015), it seems likely that electricity use in hotels in St Lucia will also be a hotspot for energy.

<sup>37</sup> [UNEP \(2016\)](#) identify that hotels account for 10% of water withdrawals for municipal / industrial use, suggesting that hotels directly account for 1.2 Mm<sup>3</sup> of water p.a. in Saint Lucia.

<sup>38</sup> Over 96% of the water use associated with hotels is found in the value chain in Antigua, the British Virgin Islands and the Dominican Republic. Most of this is associated with agriculture, food and beverages. [Yang et al \(2011\)](#), [Hadjikakou et al \(2013\)](#), [Cazarro et al \(2014\)](#) and [Zhang et al \(2017\)](#) find that tourist demand for food dominates the water footprint of tourism in a range of countries, with treatment of sewage from hotels also important. There is no reason to assume that St Lucia differs to these.

<sup>39</sup> The Saint Lucia Solid Waste Management Authority ([SLSWMA \(2016\)](#)).

Summary of hotspots across environmental impact categories – Saint Lucia

Rank	GHG	Energy	Water	Waste
4	<p><b>Primary production of fish and seafood products:</b> based on proxy data fish and seafood products used in hotels and restaurants are likely to represent a hotspot in the tourism sector in Saint Lucia.</p>	<p><b>Processing and manufacturing of fresh produce:</b> energy use in the processing and packing of produce, energy use in product chill chain or for freezing of produce post-harvest.</p>	<p><b>Water use in the electricity generation:</b> water used in cooling in power generation, emitted as steam and not returned to water source.</p>	<p><b>Waste generation of single use items in hotels and restaurants,</b> and the associated marine pollution. Plastic packaging, water bottles, cups, drinking straws, etc. creating litter and marine pollution, damaging natural environments. NOTE: Management of Containers Bill, explores a strategy and incentives to reverse the proliferation of plastic bottles in the environment, which has become a major pollutant and a cause of flooding in urban centres (plastics accounted for 22% of national solid waste in 2008)<sup>40</sup>.</p>

<sup>40</sup> Source: SLSWMA Waste Characterisation Study 2008.

To elaborate on the information contained in **Table 3** above, the environmental impact hotspots identified for the tourism sector in Saint Lucia are broadly split between:

- **Electricity and fuel use in hotels and restaurants**, and its impacts upstream in the value chain including energy generation and its climate change impacts and environmental impacts associated with the extraction of raw materials (fossil fuels: coal, oil and gas), their conversion to electricity or heat and the transmission of energy. The 2015 commercial electricity rates in Saint Lucia were \$0.47 per kilowatt-hour (kWh), higher than the residential tariff of \$0.34 per kilowatt-hour (kWh), which is in line with the Caribbean regional average of \$0.33/kWh, suggesting this could be a driver of energy efficiency and renewable energy programmes in the tourism sector. Energy audits in Caribbean hotels indicate that on average 30% of hotel energy costs are related to air conditioning;
- **Primary production of food and beverage** and related climate change, energy, water and waste impacts (e.g. meat, fish and seafood and fresh produce production). Later stages in food value chains, such as processing and cooking, also carry significant impacts. Saint Lucia imports between 60-65% by weight of the food and beverage products required for the tourism sector each year; with one participating hotel reporting that it waste 41% of the food it buys; and WU (2014): [Global Material Flows Database](#) suggests that unused food accounted for 65,000 tonnes of waste in Saint Lucia in 2013, 98% of wasted biomass in Saint Lucia. This is equivalent to 54% of biomass harvested for food, suggesting significant opportunities for efficiency gains.
- **High generation and inappropriate treatment of liquid and solid waste in hotels and restaurants**, and associated climate change, water and waste impacts. These are leading to pollution of land, water and air and are worsened by deficiencies in national infrastructure. E.g. ground water, river and marine pollution from leachate at open, unsealed landfill sites, air pollution from fires caused by methane emissions at landfill sites; marine plastic pollution; water/marine pollution from untreated or inadequately treated wastewater.
- **Water use in hotels**, e.g. washing and sanitation, cleaning of rooms and public spaces; and for leisure activities, like swimming pools and spas.

Further detail on the nature of the hotspots and their drivers is provided in the table in **Annex F**. Red cells in this table indicate a hotspot and orange indicate a life cycle stage with a lower, but still significant, contribution to the overall life cycle impacts.

## 7. Hotspots long-list of solutions

During the year of 2017, workshops were held in each of the four pilot countries to build better understanding of the environmental hotspots associated with tourism and identify potential actions to address these. A literature review has also been carried out to identify potential actions. Together, these form the long list of potential actions identified below. These actions will subsequently be reviewed for their feasibility and impact to enable shortlisting in 2018. Some actions may be recommended even where their impact may not

be quantifiable (e.g. the adoption of a policy), as an enabling action which allows other activities to occur which may be quantifiable.

In St Lucia, the objective is to identify solutions which can be delivered through government policy or strategy, and all actions listed below should be read in this context.

However, for completeness and to help identify situations where national policy and strategy interventions can support business action, the long list of solutions has been split into business-level solutions, which are presented first and segmented by topic, followed by national-level solutions that have been ranked and grouped based on their likely impact, that require actions led by government policy-makers and/or that call for public or public/private sector investment in national and local infrastructure to address identified hotspots.

Where appropriate some solutions are presented as both business and national-level solutions as action can be taken by individual businesses but may benefit from a supporting national policy, strategy or legal framework – e.g. a circular economy policy package could support the development and procurement of sustainable products and services by businesses; or a national food waste strategy would support actions by business to quantify and reduce their food waste.

The next stage of the project will involve shortlisting solutions and at this stage some items on the long list may be brought together under an overarching policy ambition. For example, requiring hotels to achieve an environmental certification or incentivising investments could deliver multiple items on the long list.

To summarise, the long list covers the following range of solutions and interventions:

**Business value chain solutions and interventions:** have the potential to be implemented by individual tourism businesses and value chains or via collaborations between tourism businesses and/or the public sector. Some business value chain solutions would benefit from a supportive government policy and strategy framework, like the options for national-level solutions identified below.

- **Sharing best practice and site visits:** the potential for hotels and restaurants to learn from each other's best practices and to learn from other's experiences of implementing solutions (e.g. food waste reduction, energy management, water efficiency).
- **Team training and cross-functional training:** training within and across teams to enable members to minimise their contribution to environmental hotspots by equipping them to deliver a range of solutions and interventions – e.g. sustainable procurement approaches, monitoring and measuring resource use (food and beverages, water and energy) as well as eco-design tools and techniques for buildings and rooms.
- **Sustainable purchasing and value chain initiatives:** that enable multiple hotspots across all impact categories to be addressed, including sustainable procurement policies and practices; appointing a 'green procurement champion'; adopting voluntary sustainability standards for key raw materials (e.g. seafood, timber and paper, textiles); supplier accreditation, environmental KPIs and benchmarking and

shared / consortia-based supplier platforms and databases to help identify reliable, high-performing suppliers; the use of product/packaging specifications and healthy, sustainable menus (e.g. product life requirements for hotel furniture and electrical items, local, seasonal sourcing of food).

- **Improving operational practices:** including the provision of information to guests to help them make environmentally friendly choices when choosing or buying goods and services; adopting healthy, sustainable menus to reduce the environmental ‘food print’ of food served in destinations; measuring and monitoring food waste; reviewing food storage, preparation and cooking practices (e.g. portion control) and using data analytics to improve inventory management and demand forecasting to reduce food waste; donating uneaten food and establishing food recycling programmes to produce compost and renewable energy.
- **On-site energy management and efficiency:** making significant improvements in energy use by: developing an energy and GHG policy; conducting and acting on the findings of energy audits; specifying energy efficiency and GHG emission improvements in HVAC systems, installing energy storage systems, hotel room energy management systems and electrical equipment (including laundries); installing room energy management systems; and increasing the amount of in-situ renewable energy generation.

#### **National-level solutions and interventions:**

National-level solutions that have been ranked and grouped based on their likely impact and require either actions led by government policy-makers and/or that call for public or public/private sector investment in national and local infrastructure to address identified hotspots. They include:

- **Developing / adapting a National GHG / Energy Policy for the tourism sector:** policies on renewable energy and energy efficiency can provide essential context for business action. It is worth noting that a National Energy Plan was launched in Saint Lucia in 2010, followed by the introduction of the St Lucia Energy Roadmap (2016). The roadmap presents a five-year plan of cost-effective energy efficiency programs, renewable energy, and energy storage investments, as well as the necessary regulatory changes to set Saint Lucia on the pathway to meet its energy transition goals (30% of Saint Lucia’s energy needs must be met through renewables by 2020 in support of its UN FCCC Nationally Determined Contribution target to reduce GHG emissions by 16% by 2025 and 23% by 2030). Both of these initiatives could form the basis for this solution. In order to deliver Saint Lucia’s Nationally Determined Contribution (NDC) targets under the Paris Agreement (November 2015), energy efficiency measures also need to displace 11% of its energy generation needs by 2025.
- **Improving the production and conversion of energy:** build on existing and planned renewable energy infrastructure projects (e.g. geothermal and wind energy projects) to reduce heavy dependency on imported fossil fuels for the generation of energy; and improving the energy distribution systems. Geothermal, solar, wind and biomass power have yet to be fully exploited in Saint Lucia.
- **Mandatory and voluntary standards for efficient use of resources and energy in hotels and restaurants:** support the creation of mandatory standards for efficient use



of resources and measurement of emissions in all hotels with more than 100 rooms. Voluntary for Hotels with 50+ rooms. Also potential to look at mandatory and voluntary standards for the use of solar hot water systems in hotels.

- **Policy support for healthy, sustainable food sourcing, purchasing and diets:** the development of dietary guidance that promotes and supports the use of healthy, low-carbon and resource efficient menus in hotels and restaurants to reduce the greenhouse gas emissions (GHG) resulting from sourcing, menu and consumption decisions. A healthy, low-carbon and resource efficient menu minimizes the emissions released from the production, packaging, processing, transport, preparation and waste of food. Major tenets of a healthy, low-carbon diet include eating less industrial meat and dairy, eating less industrially produced food in general, eating food grown locally and seasonally, eating less processed and packaged foods and portioning of meals accordingly to the nutritional needs of visitors. Research and experience elsewhere e.g. the revised Live Well Plate ('Eating for 2 Degrees')<sup>41</sup> shows that it is possible to achieve a 30% reduction in greenhouse gas emissions by 2030 based on sourcing and eating this way.
- **National food waste strategy:** develop a national food waste strategy in line with UN SDG target 12.3 to halve food loss and waste by 2030, with specific components and targets for the tourism sector, including food waste reduction targets, incentives to redistribute surplus food to charitable organisations and the provision of food waste recycling infrastructure to enable the production of renewable energy from biogas and compost for use in agriculture. Implementation of the strategy could include a voluntary agreement with the tourism sector; a consumer/tourist focused behaviour change campaign in collaboration with tourism operators, hotels and restaurants; and a national food waste quantification and best practice platform.
- **National circular economy policy package:** development of a circular economy policy package that encourages and promotes the development of more sustainable, innovative products and services, including consideration of circular / sustainable product, service and business model design and procurement, the promotion of sustainability standards and certification in tourism, energy efficiency and product life extension for electrical and electronic products. This should include the creation of incentives to drive the procurement of more sustainable products and services and promoting demand for certified sustainable products.
- **Enhance legislation and regulation of waste management to optimise waste management and reduce land-based, river and marine pollution:** the role of legislation in ensuring appropriate collection and management of waste streams was identified in workshops in the Philippines and the Dominican Republic; and according to the Saint Lucia Solid Waste Management Authority (SLSWMA) hotel waste has been rising at a rate of 5% a year since 2008. The SLSWMA is also responsible (under the Waste Management Act No. 8 of 2004) for revising the National Waste Strategy every five years, so is well-placed to lead or coordinate this activity, which could include the acceleration into law of a Management of Containers Bill, that would explore a strategy and incentives to reverse the proliferation of plastic bottles in the

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<sup>41</sup> Source: <https://www.wwf.org.uk/eatingfor2degrees>

environment, which has become a major pollutant and a cause of flooding in urban centers (plastics accounted for 22% of national solid waste in 2008)<sup>42</sup>.

- **Enhance legislation and regulation on drinking water quality and wastewater treatment to improve infrastructure, water security and protect tourism biodiversity resources:** the role of legislation in ensuring drinking water quality, working with the Saint Lucia Water and Sewerage Company Inc. (WASCO) on improvements to the freshwater distribution system and the appropriate collection and treatment of wastewater, to improve water security in the tourism sector and protect the natural environment on which the tourism sector depends.
- **Review of St Lucia Tourism Strategy and Action Plan (2013):** conduct a five-year review of the St Lucia Tourism Strategy and Action Plan (2013) to help identify new opportunities for Saint Lucia, as a destination, to be more sustainable, energy efficient and climate sound (for example by using renewable energy); make tourism businesses more sustainable, increase benefits to local communities and raise awareness and support for the sustainable use of natural resources; whilst consuming less water and minimizing waste. This could include the reintroduction of licencing/certification standards for all tourism sub-sectors, together with a ‘hospitality assured’ programme and policies for sports and water-based tourism by the Saint Lucia Tourism Authority (SLTA), following a decline in this activity when hotel certification/accreditation was introduced for the 2007 Cricket World Cup.
- **Making the transportation network more sustainable:** the EU [Sustainable Transport for Areas with Tourism through Energy Reduction \(STARTER\)](#) project identifies that “the seasonality of tourism demand leads to rising demand for transport and mobility services during the high season, which impacts heavily the traffic in specific touristic regions... dealing with the challenges posed by seasonal traffic is not simply the task of the authorities: main players of the transport sector, environmental organisations and the tourism sector should join forces to resolve related issues... The concept of ‘Local Travel Plan Networks (LTPN)’ can be used to shift tourist travel to more sustainable mobility options”.

The National Transportation Policy for Saint Lucia is currently being reviewed given the growing instances of traffic jams caused by tourism-related activities (tours, excursions, taxis and car hire), and offers an opportunity to improve transport infrastructure and planning (particularly between Hewanorra International Airport and major tourism resorts), as well as exploring the potential for cleaner fuels and vehicles.

A full list of business value chain and national-level solutions captured during the 2018 country workshop in Saint Lucia can be found in **Annex F** of this report.

In order to contextualise how these solutions discussed in the workshop in 2018 address the hotspots identified in the report, the following summary table has been provided.

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<sup>42</sup> Source: SLSWMA Waste Characterisation Study 2008.

**Table 4:** Long list of business value chain and national-level solutions and interventions. below summarises the solutions, their sources and the relevant hotspot they are connected to. In the next stage of this project (shortlisting of solutions) we will assess their potential contribution in terms of GHG reduction and resource efficiency to addressing the hotspots.

**Table 4: Long list of business value chain and national-level solutions and interventions.**

i = indirect solution for hotspot

d = direct solution for hotspot

Long list of solutions	Hotspots in Tourism Value Chain – Saint Lucia																			
	GHG					Energy					Water					Waste				
	Meat and dairy products	Direct emissions in tourism value chain	Primary production of fresh produce	Fossil fuel based energy generation	Fish and seafood products	Transportation	Electricity used for Hotel and restaurant activities	Meat and poultry products	Fresh produce	Preparation and cooking of food	Water used in agriculture	Water use in hotels and restaurants	Primary production of produce	Water resource management	Water use in the energy	Food waste in hotels and restaurants	Fresh produce	Waste management infrastructure	Landfilled organic waste	Single use items
Review of Saint Lucia Tourism Strategy and Action Plan	i	i		i	i		i	i		i	i	i	i	i		i		i	i	i
Share best practice / visits	i	i		i	i	i	i	i		i					i	i			i	i
Provision of training for functions / across teams	i	i		i	i		i	i			i					i			i	i
Adopt a sustainable procurement / purchasing policy	i	i	i	i	i		i	i	i		i		i				i			i
National circular economy policy package		i		i			i	i			i	i	i	i		i			i	i
Create incentives for purchasing more sustainable items	i	i	i		i			i	i		i	i	i	i		i	i			i
Promote the demand for certified products	i		i		i			i	i		i		i				i			

Long list of solutions	Hotspots in Tourism Value Chain – Saint Lucia																			
	GHG					Energy					Water					Waste				
	Meat and dairy products	Direct emissions in tourism value chain	Primary production of fresh produce	Fossil fuel based energy generation	Fish and seafood products	Transportation	Electricity used for Hotel and restaurant activities	Meat and poultry products	Fresh produce	Preparation and cooking of food	Water used in agriculture	Water use in hotels and restaurants	Primary production of produce	Water resource management	Water use in the energy	Food waste in hotels and restaurants	Fresh produce	Waste management infrastructure	Landfilled organic waste	Single use items
Define sustainable product specifications for hotspots	i		i		i			i	i		i		i				i			i
Supplier accreditation	i	i	i		i				i				i				i			i
Champion for green procurement	i	i	i		i				i				i				i			i
Agree a replacement schedule for equipment / furniture																				i
Replacing high impact food for low impact	i		i		i			i	i		i		i				i			
Ban single use items																			i	d
Create cleaner production awards	i		i		i			i	i		i		i	i			i			
Create environmental protocols for suppliers	i		i		i			i	i		i		i	i			i			
Programme to encourage purchase of local crafts																				
Setting specification for room design		d		i			d					i			i					

Long list of solutions	Hotspots in Tourism Value Chain – Saint Lucia																			
	GHG					Energy					Water					Waste				
	Meat and dairy products	Direct emissions in tourism value chain	Primary production of fresh produce	Fossil fuel based energy generation	Fish and seafood products	Transportation	Electricity used for Hotel and restaurant activities	Meat and poultry products	Fresh produce	Preparation and cooking of food	Water used in agriculture	Water use in hotels and restaurants	Primary production of produce	Water resource management	Water use in the energy	Food waste in hotels and restaurants	Fresh produce	Waste management infrastructure	Landfilled organic waste	Single use items
Build a consortium with other businesses to enable changes in procurement practices	i	i	i		i			i	i		i		i				i			
National food waste strategy	i		i		i			i	i		i		i			i	i	i	d	
Provision of information to guests	d	d		i	i		d	i			i	d			i	i			i	
Diversify menus / Offer a local /seasonal meal to tourists	d		d		d		d	d	d	i	i	d	i			d	i		i	i
Make some products available on request only	d		i		i			d	i	i	i		i			d	i		i	d
Monitor and measure food waste	i		i		i			i	i	i	i		i			d	i		i	
Review cooking and storage practices	i	i	i	i	i		i	i	i	d	i		i		i	d	i		i	
Communicate with customers and review portion and plate sizes	d		i		i			d	i	i	i		i			d	i		i	

Long list of solutions	Hotspots in Tourism Value Chain – Saint Lucia																			
	GHG					Energy					Water					Waste				
	Meat and dairy products	Direct emissions in tourism value chain	Primary production of fresh produce	Fossil fuel based energy generation	Fish and seafood products	Transportation	Electricity used for Hotel and restaurant activities	Meat and poultry products	Fresh produce	Preparation and cooking of food	Water used in agriculture	Water use in hotels and restaurants	Primary production of produce	Water resource management	Water use in the energy	Food waste in hotels and restaurants	Fresh produce	Waste management infrastructure	Landfilled organic waste	Single use items
Use of data / analytics to better predict demand for food and drink	i		i		i			i	i	i	i					d	i		i	
Staff training on the importance of food	i		i		i			i	i		i					i	i		i	
Donate uneaten food	i		i		i			i	i		i					i	i		i	
Food recycling programmes																			d	
Enhance legislation on waste management to optimise waste management											i					i	i	d	i	i
Energy Audit		d		i		d	d			d					i					
Frequency Convertors		i		i			i			i					i					
Train architects in energy efficient design		d					d				i				i					
Mandatory standards for efficiency in large hotel		d				i	d			i	i				d	d				
Improve access to finance		i		i		i	i			i	i				i					

Long list of solutions	Hotspots in Tourism Value Chain – Saint Lucia																			
	GHG					Energy					Water					Waste				
	Meat and dairy products	Direct emissions in tourism value chain	Primary production of fresh produce	Fossil fuel based energy generation	Fish and seafood products	Transportation	Electricity used for Hotel and restaurant activities	Meat and poultry products	Fresh produce	Preparation and cooking of food	Water used in agriculture	Water use in hotels and restaurants	Primary production of produce	Water resource management	Water use in the energy	Food waste in hotels and restaurants	Fresh produce	Waste management infrastructure	Landfilled organic waste	Single use items
National GHG / Energy Policy	i	i		i	i	i	i	i		i					i			i		
Company GHG / Energy Policy	d	d		i	i	i	d	d							d			i		
Improve production / conversion of energy		i		i			i			i					i					
Own PV, biomass, wind turbines		i		d		i	i			i					i					
Improve efficiency and climate-friendliness of HVAC		d		i			d			i					i					
Increase efficiency of other electrical equipment		i		i			i			i					i					
Room energy management systems		d		i			d			i					i					
Transportation Network		i		i		d														
Laundry		d		i			d					d			i					



## 8. Key Environmental Indicators

UN Environment (2017) [Recommended key environmental indicators for the tourism private sector](#) identifies major environmental indicators that would help the tourism private sector to contribute to the [Sustainable Development Goals](#) (SDGs) and the UNFCCC's Paris Agreement using a Life Cycle perspective. Based on the assessment of hotspots in the Saint Lucia, the following indicators are recommended in **Table 5** below:

Key Environmental Indicator	Level	Units	Evidence / Source
Total energy use	Total and by functional unit	Megajoules, MJ	Grid electricity, renewable electricity, combustion of fuels.
Total volume of solid waste generated	By waste type, total and functional unit	Kilogrammes, kg	
Total quantity of animal meat by meat type	Total and by functional unit	Kilogrammes	Purchase ledger
Corporate carbon footprint	Total and by functional unit	Kg CO <sub>2</sub> eq	
Total Volume of Water Use	Total and by functional unit	Volume	Metering
Water Footprint (ISO14046)	Total and by functional unit	Volume	Databases (e.g. within LCA software)

**Table 5: Recommended key environmental indicators.**

Based on the surveys undertaken, data on energy use on site by hotels and restaurants is frequently collected and recorded. Data on waste and purchases are infrequently collected. Water foot-printing is not undertaken on a regular basis by any organisation surveyed and corporate carbon footprint is infrequently reported. In order to use the recommended indicators there is a need for additional commitment from hotels and restaurants, along with the capacity building being provided through this project. Improvement of organisation structures for reporting and co-ordination with public utilities and suppliers will be required to generate the required information.

## 9. Conclusions

The hotspots analysis process has identified several challenges to effectively providing a baseline for greenhouse gas emissions and resource efficiency of hotels.

There was no national data was identified for St Lucia and so proxy data was used for other Caribbean Islands to infer hotspots in St Lucia. Through databases such as Eora, territorial impacts can be identified for a range of environmental issues. However, whilst imports from overseas are quantified in terms of total expenditure, they are not identified as specific products. So, whilst it may be known how much has been spent by a sector on imports from a certain country, it is not possible to use the same database to identify what these are. Additional measures must therefore be taken to understand the importance of imported produce.

One way to address this, is to obtain data directly from organisations within the tourism value chain. To this end, a survey has been undertaken to gather data. However, a systematic issue is that accounts departments either do not have data available in a suitable format or are unable to provide data on purchases. Across the four countries participating in the Transforming Tourism Value Chains project less than 10 hotels have been able to provide the necessary data to date, and only 1 hotel has been able to provide information to date in St Lucia.

The main identified hotspots for GHG emissions were food and electricity. Water hotspots were predominated by food (agriculture). Within electricity, HVAC in hotel rooms are the main hotspot, whereas within food, it is the use of red meat and food wastage in hotels.

The proxy data for other islands, data for one hotel in St Lucia and the literature review indicate common hotspots are likely. Approximately 40 potential actions have been identified which can address the hotspots for the different environmental issues.

Sufficient data has been gathered to allow the project to progress to the next stage of shortlisting and prioritising interventions which can address hotspots in the tourism value chain, whilst continuing to collect information from individual organisations to increase the level of insights and aid quantification of impacts and opportunities.

A key recommendation from this report is that there should be subsequent follow-up activities agreed with all project partners, to further comment on, and develop policy recommendations in each country. This will be developed as a result of the shortlisting activity being delivered in the next workshop in June 2018. This report will provide the evidence and basis from which Travel Foundation will deliver the Saint Lucia National Action Plan report, with support from the STAG and technical partners WRAP and UDP.