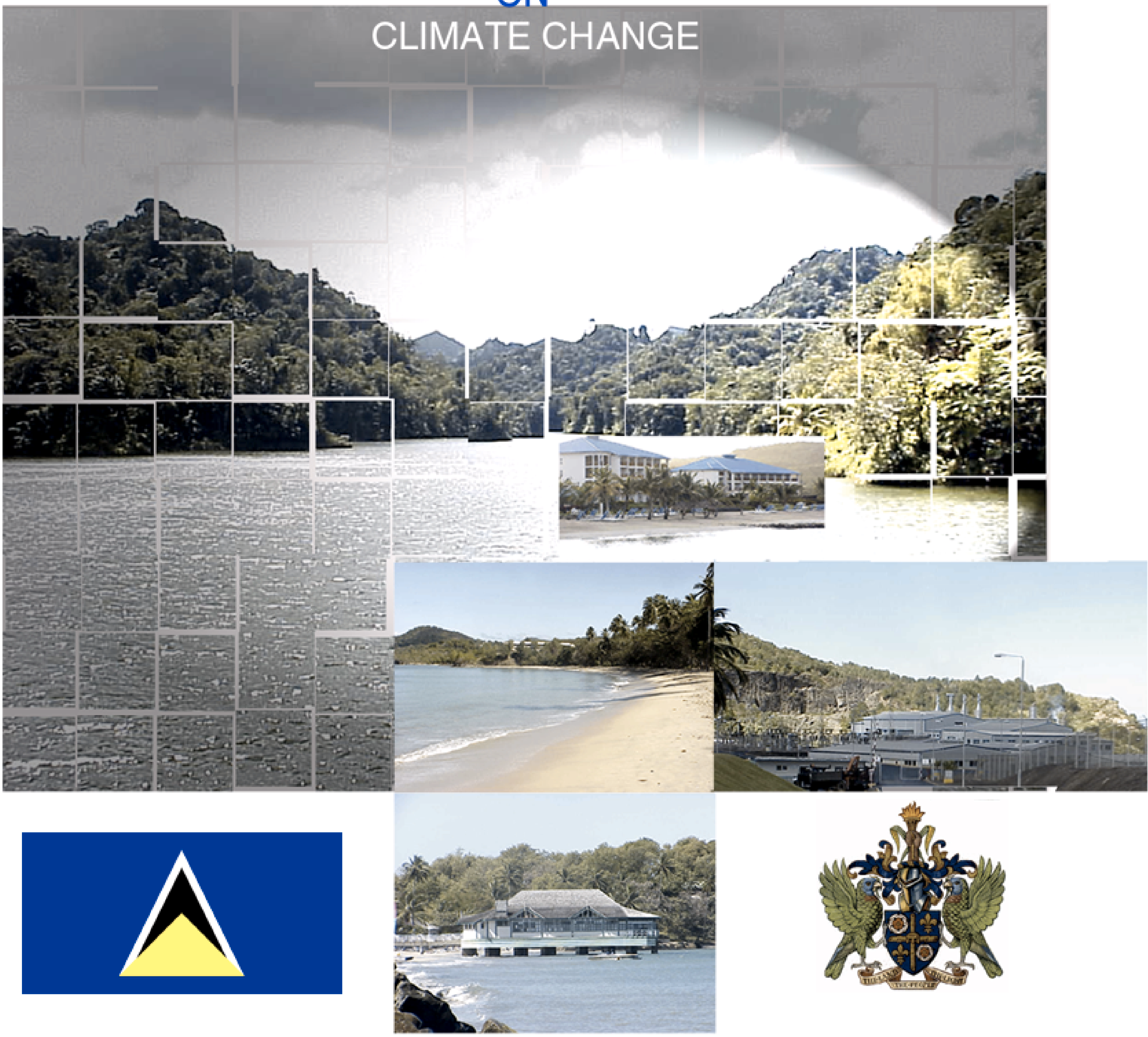
SAINT LUCIA'S INITIAL NATIONAL COMMUNICATION ON CLIMATE CHANGE



IN RESPONSE TO ITS COMMITMENTS UNDER THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE.

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PREFACE

St. Lucia's First National Communication to the Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC) is the culmination of a programme of Enabling Activities undertaken by the Government of St. Lucia in fulfilment of commitments under the Convention. It has been prepared in accordance with Guidelines laid down by the Conference of Parties (COP) in Decision 10/CP2 and according to Articles 4 and 12 of the Convention which St. Lucia ratified on 14th June 1993.

This document constitutes an output of a project (STL/97/G31) funded through the Global Environment Facility (GEF). The project has been implemented by the United Nations Development Programme (UNDP) and executed by the Government of St. Lucia through the Ministry of Planning Development, Environment & Housing.

The Government of St. Lucia is fully cognizant of the need to disseminate climate change information to relevant national, regional and international interests. This document is therefore seen as a vehicle for enhancing awareness and knowledge of climate change issues as they pertain to St. Lucia.

LIST OF ABBREVIATIONS & ACRONYMS

CARILEC	-	Caribbean Electricity utility Services Corporation
CCCDF	-	Canadian Climate Change Development Fund
CDM	-	Clean Development Mechanism
CH4	-	Methane
CNG	-	Compressed Natural Gas
CO	-	Carbon Monoxide
CO_2	-	Carbon Dioxide
CPACC	-	Caribbean Planning for Adaptation to Climate Change
CREDP	-	Caribbean Renewable Energy Development Project
DOC	-	Degradable Organic Compound
DSM	-	Demand Side Management
EEZ	-	Exclusive Economic Zone
ESCO	-	Energy Service Companies
GCMs	-	General Circulation Models
GDP	-	Gross Domestic Product
GEF	-	Global Environment Facility
GHG	-	Greenhouse Gas
Gg	-	Gigagram
GOSL	-	Government of Saint Lucia
HFC	-	Haloflorocarbon
IGCI	-	Canadian Government Information on the Internet (CGII) / Information Gouvernementale Canadienne sur l'Internet (IGCI)
IPCC	-	Inter-governmental Panel on Climate Change
IPPs	-	Independent Power Producers
ITCZ	-	Inter Tropical Convergence Zone
Kt	-	Kilotonne
LBSMP	-	Land-Based Sources of Marine Pollution
LPG	-	Liquefied Petroleum Gas
LUCELEC	-	Saint Lucia Electricity Services Ltd.
LULUCF	-	Land Use, Land Use Change and Forestry
MACC	-	Mainstreaming Adaptation for Climate Change

MAFF	-	Ministry of Agriculture, Forestry and Fisheries
MARPOL	-	Marine Pollution (Convention)
MCF	-	Methane Correction Factor
MOH	-	Ministry of Health
MOL	-	Ministry of Labour
MOP	-	Ministry of Planning
MPDEH	-	Ministry of Planning, Development, Environment and Housing
MSW	-	Municipal Solid Waste
MW	-	Megawatts
N_2O	-	Nitrous Oxide
NBSAP	-	National Biodiversity Strategy and Action Plan
NCA	-	National Conservation Authority
NCCS	-	National Climate Change Strategy
NDC	-	National Development Corporation
NEMO	-	National Emergency Management Organization
NISEE	-	National Information Service for Earthquake Engineering (University of California, Berkeley)
NMVOC	-	Non-Methane Volatile Organic Compound
NOX	-	Nitrous Oxide
O_3	-	Ozone
PSIP	-	Public Sector Investment Programme
PV	-	Photovoltaic
RBDC	-	Rodney Bay Development Company
RSLPF	-	Royal St. Lucia Police Force
SIDS	-	Small Island Developing State(s)
SLASPA	-	St. Lucia Air and Seaports Authority
SLNT	-	St. Lucia National Trust
SO_2	-	Sulphur Dioxide
SPREP	-	South Pacific Regional Environmental Programme
SSS	-	Sun, Sea and Sand
SWDS	-	Solid Waste Disposal Site
TJ	-	Terajoule
TOE	-	Tonne of Oil Equivalent
UNCDB	-	United Nations Convention on Biological Diversity

UDC	-	Urban Development Corporation
UNDP	-	United Nations Development Programme
UNFCCC	-	United Nations Framework Convention on Climate Change
WASCO	-	Water and Sewerage Company

EXECUTIVE SUMMARY

BACKGROUND

The preparation of St. Lucia's First National Communication to UNFCCC was funded by the Global Environmental Facility (GEF) through the United Nations Development Programme. The process, which commenced in June 1999, was executed by the Ministry of Planning, Development, Environment & Housing and coordinated through the broad-based National Climate Change Committee.

The process of preparing this initial communication necessitated the involvement and participation of a wide range of stakeholders from various sectors. These were drawn from Government agencies, statutory bodies, non-governmental organizations and civil society.

Technical studies were undertaken using local and regional expertise. Wherever possible, even when non-national consultants were contracted, local capacity was strengthened in order to carry out as much of the work as possible. Key areas of focus for capacity building included:
Inventory of Greenhouse Gases;
Vulnerability and Adaptation Assessment;
Web Site Development and Maintenance.

The National Communication is arranged as follows:

National Circumstances
National Inventory of Greenhouse Gases
Greenhouse Gas Abatement Analysis
Vulnerability and Adaptation Assessment
General Description of Steps Taken
Financial & Technological needs

NATIONAL CIRCUMSTANCES

St. Lucia is one of many Small Island Developing States (SIDS) located in the Caribbean Sea. It is of relatively recent volcanic origin with a rugged topography.

As is typical of many such States, St. Lucia is characterized, inter alia, by:
Limited mineral resources;
An open fragile economy highly vulnerable to external economic factors;
Limited human resources;
Limited financial and technical resources.

Although a small island, St. Lucia has a relatively high level of biological and ecosystem diversity. It is home to numerous terrestrial and marine plants and animal species. Ecosystems include rainforest, coral reefs, mangals and sea grass beds

Population centres and economic activities, including tourism, are concentrated along the coast. These are therefore highly vulnerable to the anticipated effects of climate change such as sea-level rise.

Water resources occur mainly in the form of surface streams. These are tapped for the municipal supply as well as for agricultural purposes. During the dry season, water shortages are often experienced in many areas. The supply of water has been affected over the years by deforestation and there is grave concern that it may be further negatively affected by the effects of climate change.

St. Lucia is poor in mineral resources including petroleum. Consequently, there is heavy dependence on imported fuels for electricity generation. Approximately 97 percent of the population currently has access to electricity.

The main economic activities are tourism, agriculture, services and manufacturing, in that order. Bananas constitute the main agricultural export although production has fallen sharply over the last few years due to unfavourable developments in traditional markets. This serves to underscore St. Lucia's vulnerability to external economic factors.

Overall, St. Lucia's fragile natural and economic circumstances make it highly vulnerable to external events. Climate change is therefore likely to have a significant impact on the natural, social and economic environment of the country.

NATIONAL INVENTORY OF GREENHOUSE GASES

For the Inventory of Greenhouse Gases (GHGs), 1994 is used as the reference year. Calculations were done using IPCC guidelines. In that year, total CO_2 emissions were calculated at 268 Gg. The energy sector was St. Lucia's largest source of GHGs, followed by the transport sector. Emissions were offset by absorption by sinks resulting in net 74Gg. It was recognized during the conduct of the inventory that there were significant data gaps and that IPCC values were not totally applicable to the St. Lucia context. These observations underscored the need for capacity building in order to establish and maintain appropriate systems for data collection and analysis.

CLIMATE CHANGE VULNERABILITY AND ADAPTATION

A number of key effects have been ascribed to climate change. These include higher global temperatures; sea level rise; more intense weather phenomena such as hurricanes and droughts and changing rainfall patterns.

The initial Vulnerability and Adaptation study carried out for St. Lucia in the context of these effects involved the assessment of climate change impacts on Agriculture; Coastal Resources; Forestry and Terrestrial Resources; Human Settlements; Freshwater Resources; Fisheries; Health and Tourism.

The overall conclusion of the study is that all sectors are likely to be significantly impacted by climate change with major, mostly adverse, environmental, economic and social consequences. Of particular concern are the anticipated impacts on agricultural production, water supply, fisheries, tourism and coastal resources.

The study identifies measures for adapting to the effects of Climate Change. These include public awareness, the introduction of drought- and salt-resistant crops; development of a national water management plan, watershed protection and relocation of critical infrastructure.

ABATEMENT ANALYSIS

St. Lucia's greenhouse emissions originate from various sources in the energy, transportation and agricultural sectors. The abatement analysis identified, and assessed the suitability of, a wide range of options for reducing emissions. These range from the increased exploitation of renewable sources of energy such as wind, to the introduction of alternative- fuel vehicles. The need for demand-side management in the energy sector was also recognized.

The Abatement Analysis was undertaken in the context of an ongoing process to formulate a Sustainable Energy Plan for St. Lucia. This process was initiated following St. Lucia's announcement during the 5th Conference of Parties to the UNFCCC of its intention to become the world's first Sustainable Energy Demonstration Country.

GENERAL DESCRIPTION OF STEPS TAKEN

St. Lucia, as a Small Island Developing State, has limited capacity to address the myriad issues to be faced as a result of the climate change phenomenon. Notwithstanding, notable progress has been achieved in areas such as policy development, public awareness, systematic observation and research and capacity building.

FINANCIAL AND TECHNOLOGICAL REQUIREMENTS

The effects of climate change will have far reaching implications for all aspects of life in St. Lucia. Steps must therefore be taken to address all relevant issues in a proactive, coordinated manner. Given St. Lucia's limited human, financial and technological resources, regional and international cooperation and support will be required in a number of key areas including research, capacity building, adaptation measures, sustainable energy initiatives and public awareness.

NATIONAL CIRCUMSTANCES

1.1 INTRODUCTION

St. Lucia, (13°59´ N, 61° W) is a Small Island Developing State situated approximately mid-way in the Lesser Antillean Arc in the Caribbean Archipaelago. It sits on an ancient volcanic ridge connecting Martinique to the north and St. Vincent to the south. It has an area of 616 square kilometers and an estimated population (2000) of 156,300. St. Lucia is classified as a middle-income Small Island Developing State.

1.2 GEOGRAPHY

Figure 1.1 Map of St. Lucia showing location in Caribbean Chain.

The island of Saint Lucia is 42km from north to south and 22 km from east to west and has a total area of 616 square km. The island is very rugged in topography with a narrow coastal ridge, deep valleys and rugged mountains in the central region reaching an altitude of 950 m (Mt. Gimie). The slopes are cut by numerous fast-flowing streams. Perhaps the most spectacular landmarks are the twin Pitons (pinnacles of solid lava) rising sharply out of the sea, on the island's west coast.

1.3 GEOLOGY

Geologically, St. Lucia is almost entirely of volcanic origin with the oldest rocks dating back to the Early Tertiary period. These consist mainly of andesites, rhyolite and basalt. There are also limestone deposits which occurred while the island was submerged during the Lower Miocene period.

Volcanic activity continues in the Lesser Antillean and in St. Lucia, the fumaroles of the Sulphur Springs in the Soufriere area are located in what is known as the Qualibou Caldera. This depression, which is 6 km in diameter is believed to have been formed following the collapse of a large volcanic cone.

St. Lucia has a coastline of 158km. The island's coastal shelf (522km^2) is relatively narrow and drops off sharply on the west coast. St. Lucia has an Exclusive Economic Zone (EEZ) of approximately 4700 km^2.

1.4 CLIMATE

The island of St. Lucia lies within the north-east Trade Wind belt and is normally under an easterly flow of moist warm air. Its location in the Atlantic Ocean/ Caribbean sea means that ambient sea surface temperatures vary little from 26.7oC at any time. The island receives an almost constant amount of surface solar radiation from month to month. These factors combine to give St. Lucia a climate (tropical maritime) with a fairly constant high air temperature averaging near 28 degrees Celsius, but rarely rising above 33^{o}C or falling below 20^{o}C.

The island's weather is influenced by synoptic weather systems such as the Atlantic High Pressure system (Bermuda Azores), surface, mid and upper level troughs/lows, the Inter-tropical Convergence Zone, tropical waves and cyclones and the occasional frontal system. Mesoscale and microscale weather features also affect the island.

1.5 CLIMATIC ELEMENTS

1.5.1 TEMPERATURE

Since St. Lucia is a small island and because of its geographic location, the air temperature is greatly determined by the winds blowing off the surrounding oceans. There is very little variation annually in air temperatures over the island. However, diurnal temperatures can vary by as much as 10oC. The temperatures are lowest in the months of December through to March; and are highest around June to September. Mean maximum temperature is about 30.1^{o}C and mean minimum about 24.5^{o}C. Also, St. Lucia's mountainous nature can cause significant temperature variation between high and low lying regions (about 2 – 5 degrees Celsius).

1.5.2 RAINFALL

The island's annual rainfall regime can be defined by two seasons, one wet and one dry. The dry season runs from January to May and the wet from June to November.

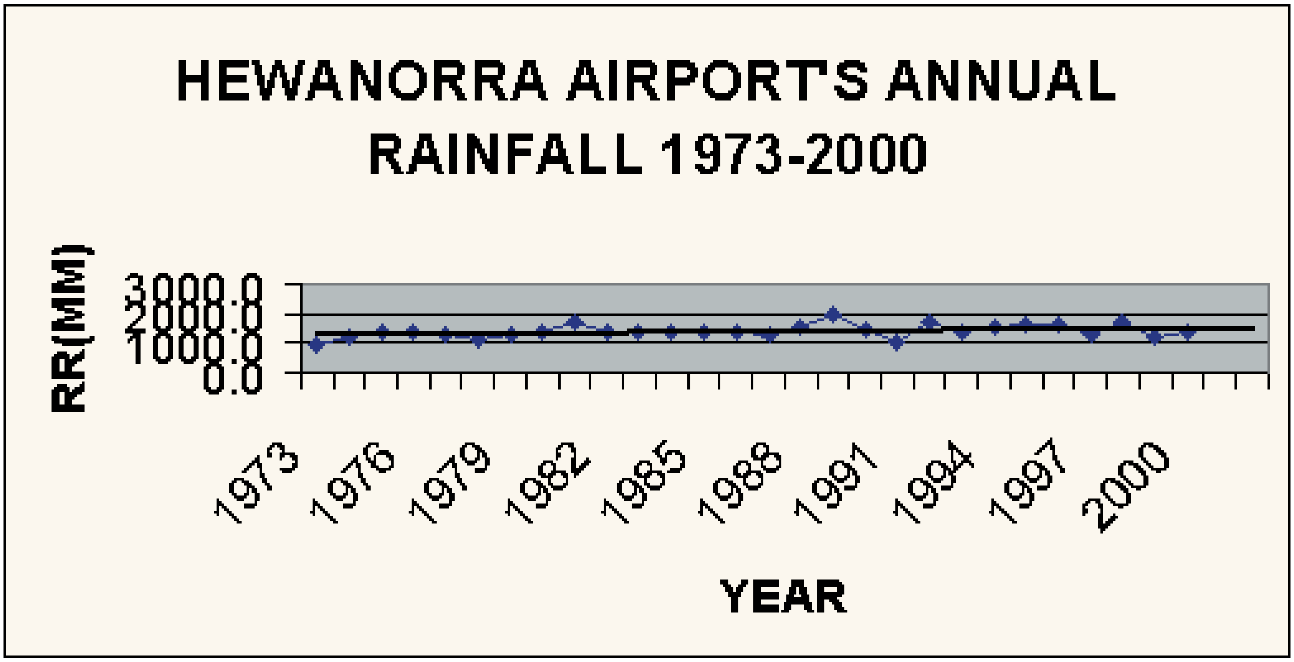
The volume of rainfall in the wet season is determined mainly by the frequency and intensity of tropical disturbances (waves, depressions, storms, hurricanes). These disturbances account for most of the recorded rainfall in that season. Local convectional showers and other weather systems, account for most of the remainder.

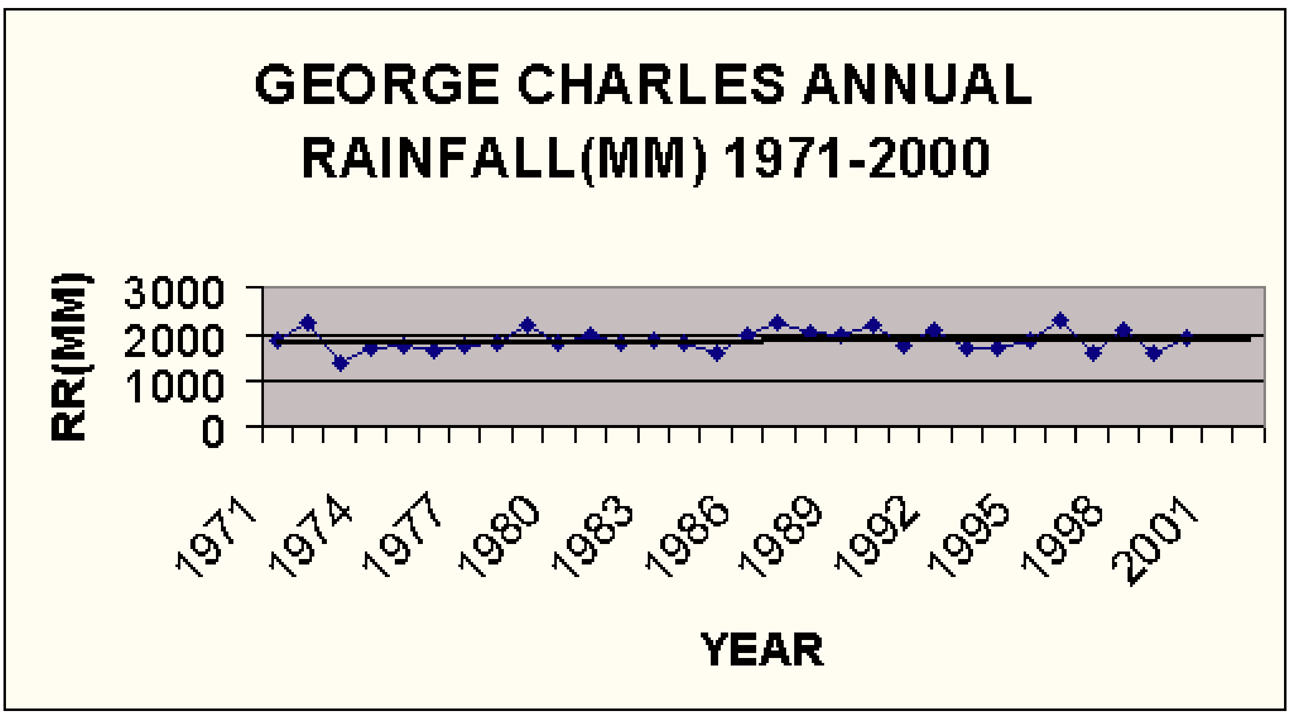
In the dry season, most of the rainfall originates from mid-latitude systems (troughs, frontal troughs, jet streams) intruding into the region.

The intrusion of the dry season rain-producing systems is randomly distributed temporally, thus, the rainfall they produce over the island is highly variable over time. On the other hand, tropical disturbances in the wet season tend to occur with a predictable frequency of roughly one every four days.

The orographic influence of rainfall is quite pronounced with amounts varying from about 1265 mm in the relatively flat coastal regions to about 3420 mm in the elevated interior region.

Figure 1.2 and 1.3 Rainfall trends for both Hewanorra and George Charles show a slight increase from the early 1970's to 2000.





1.5.3 WINDS

The island of St. Lucia lies within the northeast Trade Wind belt. Wind speeds are highest, on average, during the months of January to July, corresponding roughly with the dry season. Wind speeds average 15 mph during January to July and 10 mph during August to December. Higher gusts are occasionally experienced with the passage of tropical disturbances and cyclones.

1.5.4 HUMIDITY

Daily variation in relative humidity is at a maximum during the warmer months. The lowest value ever reported at Hewanorra was 31% in February 1998. The annual range is very small with a mean of about 77%.

1.5.5 SUNSHINE

The amount of daily sunshine received over St. Lucia is at a maximum from February to May and minimum around September.   Radiation values vary widely over the island and this is mainly due to cloud cover. Thus elevated regions with greater cloud cover receive less direct radiation than the low-lying coastal regions.

1.6 HISTORY

The earliest settlers of St. Lucia were the Ciboneys. They were an Amerindian culture who lived on the island about 2000 years before Columbus. The isand was next occupied by the Arawak Indians, from about 200 A.D., for a period of about 800 years. They in turn were invaded by the aggressive Carib Indians. When the first Europeans arrived, they found the Caribs on the island.

There is some uncertainty as to which European actually “discovered” St. Lucia. Discovery was long attributed to Columbus (1502) but it is believed by some that Juan de la Cosa may have done so in 1499. In any event, the island which had been known by the by the Amerindians as Iouanalao (Land of the iguana) was named Santa Lucia by the Spanish.

The first European attempt at settlement occurred in 1605 when Englishmen from the ship Olive Branch, landed at what is now Vieux-Fort in the south of the island. The settlers were eventually killed or chased out by the Caribs. Another English attempt at settlement, in 1639, sufferd a similar fate. The Caribs themselves were eventually driven out in 1663.

The French, in the meantime, had also laid claim to the island (c.1627). Over the next 200 years, England and France fought for ownership of the island which was to change hands fourteen times between the two countries. St. Lucia was eventually ceded to Britain in 1814, under the Treaty of Paris. Despite the ultimate British “victory’”, St. Lucia was primarily occupied by the French who occupied the island for a total of over 150 years. To this day a large percentage of the St. Lucia population speaks a French-based ‘kweyol’ as a primary or secondary language.

During the period of conflict, St. Lucia’s economy was based on plantation agriculture. Early crops included coffee, tobacco and indigo. By the nineteenth century, sugar had become the dominant crop and was to remain so until the middle of the 20th century when it would be superseded by bananas. Until 1838, labour was provided by thousands of slaves imported from West Africa. Approximately 13,000 former slaves were emancipated in that year. Following Emancipation, many slaves continued to cultivate small holdings around the island.

In the 19th century, under British rule, St. Lucia was one of the islands administered by a Governor-General based in Barbados until 1885, when Grenada became the headquarters for a new Windward Islands Government for Grenada, St. Lucia, St. Vincent and Tobago.

In the latter years of the 19th century and the early decades of the 20th century, St. Lucia was a major producer of charcoal and consequently, the capital and port, Castries, became an important coaling station for steamships. During World War II, a number of American military bases were established on St. Lucia, as in many other British colonies in the Caribbean.

Full adult suffrage was introduced in St. Lucia in 1951. In 1958, the island became a member of the short-lived West Indies Federation which collapsed in 1961. In 1967 the island became an Associated State with responsibility for internal affairs and Britain responsible for external affairs. Full independence from Britain was achieved on 22nd February 1979. St. Lucia currently has a Westminster system of Government with a 17 member elected House of Parliament and 11 member Senate nominated by the Prime Minister, the Opposition and the Governor-General, who is the representative of the British Crown.

1.7 BIODIVERSITY

Notwithstanding its small size, St. Lucia possesses a high degree of ecosystem diversity and is home to a wide range of flora and fauna. A significant portion of the island is under forest cover, although the clearing of natural vegetation continues for agriculture, construction and other purposes.

Table 1.1 Forest Area by Category

Category	Total (hectares)	Percentage
Natural Forest	12,088	55
Mangrove	355	2
Scrub Forest	7514	35
Grass & Open Woodlands	1302	6
Plantation	505	2
Total	21,764	100

The biological diversity of the island of St. Lucia consists of at least 1,310 known species of flowering plants, cycads and gymnosperms belonging to 143 families. These include 105 plants of known medicinal value and 241 recorded forest tree species. There are 118 fern species with the majority being found within the forest ecosystem. Seven fern plant species are considered endemic to St. Lucia.

There are twenty-seven endangered plants recorded in St. Lucia, most of which are found in the coastal and lowland habitats. Of the twenty-seven plants, two species (*Tetrazygia angustifolia* and *Myrcia leptocelda*) are at immediate risk of extinction because their limited habitat is threatened by urban development. Three species associated with freshwater swamps are also at risk due to the disappearance of their habitat. They include: *Pavonia paludicola, Machaerium lunatum* and *Montrichandia arborecens* (Graveson, 1998).

There are nine (9) endemic plants in St. Lucia. One of these, “palitivye wouj” (*Chrysochlamys caribaea*), a small stilt-rooted tree, grows along riverbanks in sheltered valleys where natural forest still occurs, such as along the Roseau River, above the John Compton Dam and in the rainforest. “Lowye Canelle” (*C. elongatum*), “balata” (*M. bidentata*) and “latanye” (*Coccothrinax barbadensis*), are other endemic plants which are threatened as a result of over-exploitation and extensive destruction of habitat.

There are over one-hundred-and-fifty (150) bird species, seventeen (17) reptiles, nine (9) mammals and four (4) amphibians found in the terrestrial environment of St. Lucia. The island is home to five endemic bird species: the rare St. Lucia Parrot or Jacquot (*Amazona versicolor*); the St. Lucia Blackfinch or "Moisson Pied–Blanc" (*Melanospiza richardsoni*); "Semper's Warbler" or "Pied Blanc" (*Leucopeza semper*); the St. Lucia Oriole or Carouge (*Icterus laudabilis*); St. Lucia Pewee or gobe-mouche (*Contopus oberi*). The island possesses five endemic reptiles, one endemic sub-species, (the St. Lucia Boa Constrictor) and six regionally endemic reptiles. There is one known threatened invertebrate sub-species of the hercules beetle (*Cymnastes hercules reidi*) which is confined to the montane areas.

The freshwater and mangrove wetlands of St. Lucia are relatively small but they are representative of most wetland ecosystems. The total area of St. Lucia's wetlands has been reduced from 320 hectares to 193 hectares, with some areas currently under considerable stress. There are five species of mangrove found in the island namely: red mangrove (*Rhizophora mangle*), white mangrove (*Laguncularia racemosa*), two species of black mangrove (*Avicennia germinans* and *A. schaurenia*) and buttonwood or "paltivye" (*Conocarpus erecta*).

Coral reef systems along the west coast are more diverse than those on the east coast. In general, fringing reefs are located mainly along the southeast (Anse des Sables), central west (off the districts of Anse-la-Raye, Soufriere and Laborie), and northwest coasts (Choc Bay). The healthiest and most diverse reefs are found along the central west coast, off Soufriere. Reefs of St. Lucia are under threat from high levels of sedimentation and other land-based pollutants and, therefore, near-shore fisheries are also threatened. Natural disasters such as hurricanes and storms have also taken a toll on St. Lucia's reefs.

Seagrass beds are common along St. Lucia's coast and are composed mainly of turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*) and to a lesser extent, shoal grass (*Halodule wrightii*) species. In general, larger and denser seagrass beds are found off the east coast, compared to the infrequent and sparsely covered seagrass patches along the west coast.

Three species of sea turtle are known to nest in St. Lucia: the hawksbill (*Eretmochelys imbricata*), the green turtle (*Chelonia mydas mydas*) and the leatherback (*Dermochelys coriacea*). The Grande Anse beach is the largest nesting site on the island for leatherback turtles.

1.8 POPULATION AND DEMOGRAPHY

Figures obtained from the Government Statistics Department of Saint Lucia show an estimated mid year population of 142,698 for the year 1994 representing an increase of 2781 over the figure for the previous year. The birth rate recorded for that year was 25.4 for every one thousand women between the age of 15 and 44 years. There was also a noticeable increase in the population growth rate of 0.73% over the 1993 to 1994 period which can be explained by the 1% increase noticed in the birth rate between 1993 and 1994 coupled with the decrease in the death rate of 0.1% over the same period.

While the island is divided into eight administrative regions, for demographic purposes, it is divided into 10 districts, each with a city, town major village.

Castries district, which contains the capital city of the same name, is the most populous and has the highest population density. The north-western corridor of the island, which comprises Castries and the adjacent district of Gros-Islet contains approximately 50 percent of the total population.

St. Lucia's population is largely of African origin. The next largest is group is persons of mixed origin followed by those of East Indian descent. Other groups represented are Chinese, Portuguese, Syrian-Lebanese, Caucasian and Amerindian (Carib).

Table 1.2 Summary of Vital Statistics

Selected Indicators								
	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998R**	**1999P**
Estimated Mid-year Population	138,151	139,908	142,689	145,437	147,062	149,666	151,952	153,703
Population Growth Rate	1.60	1.27	1.99	1.93	1.12	1.77	1.57	1.15
Live Births	3,761	3,556	3,684	3,705	3,299	3,444	2,950	2,906
Deaths	919	907	915	940	950	981	976	963
Infant Deaths	84	59	41	43	55	60	48	41
Still Births	60	30	44	62	57	53	39	46
Birth Rate	26.1	24.5	25.4	25.5	22.4	23.0	19.4	18.9
Death Rate	6.4	6.4	6.3	6.5	6.5	6.6	6.4	6.3
Infant Mortality Rate	23.0	17.0	11.1	11.6	16.7	17.4	16.3	14.3
Rate of Natural Increase	19.7	18.2	19.1	19.0	16.0	16.5	13.0	12.6
Median Age	21.1	21.1	21.9	21.1	22.5	22.7	23.0	24.1
Total Fertility Rate	3.0	2.8	2.8	2.9	2.5	2.6	2.1	2.1
Net Reproductive Rate	1.4	1.3	1.3	1.3	1.2	1.2	1.0	1.0
Age Dependency Ratio	76.3	72.4	71.1	69.4	68.0	66.1	64.4	62.5
Male Life Expectancy at Age 0	68.7	68.9	69.7	68.8	69.5	70.6	70.6	69.5
Female life Expectancy at Age 0	74.6	74.5	74.8	74.2	73.7	73.0	72.4	73.2

Source: Department of Statistics, Government of Saint Lucia

1.9 ECONOMY

Over the period 1980-99, the Saint Lucia economy underwent major structural changes, reflecting the growing importance of the service sector. An average economic growth rate of 4.4 percent was recorded during that period. After a period of relatively sluggish economic activity over the period 1993-1997, economic growth picked up in 1998 and 1999. Growth rates of 2.9 percent and 3.1 percent were recorded respectively, following an average growth rate of 1.3 percent over the period 1993-97. The marked improvement in economic performance was attributed largely to:

- Continued growth (2.5 percent) in the tourism sector;
- Significant expansion in construction activity
- A marked decline in the rate of contraction in the banana industry from an average of 10.3 percent over the period 1993-97 to 2.8 percent in 1998-99;
- A reduction in the rate of decline in the manufacturing industry from 1.6 percent to 1.1 percent over the same comparative periods;
- Continued strong growth in the service sector.

The external debt service ratio increased from an average of 3.2 percent in1993-97 to 4.0 percent of GDP in 1998-99 due to a fall in merchandise export earnings and the termination of grace periods for the repayment of some concessionary loans. The external debt to GDP ratio also increased from 22.8 percent to 25.4 percent over the same corresponding period.

Amidst the positive developments, there remains considerable uncertainty over the future of marketing arrangements for the island's bananas in the European market. These uncertainties arise from both external and internal factors. Moreover, the observed structural shift in the economy of St. Lucia, to a more service-oriented economy, should help cushion the fall-out from the banana industry.

Generally, the external environment seems conducive to strong growth, as the advancement of globalization opens up new opportunities for the island and the region. The ability of the island to take advantage of those opportunities will depend to a large extent on the pursuit of sound macroeconomic policies and improving the environment for trade and investment.

The Government of Saint Lucia recognizes that the economy must be restructured and repositioned if it is to respond to the challenges and opportunities presented by globalization and liberalization. Agriculture, tourism, education and human resource development, financial services and technology will form the core of Government's development strategy. The Government will promote the tourism sector as the leading sector, give greater impetus to agricultural diversification, support the transition in the banana industry by establishing an appropriate regulatory framework and develop the international financial services and informatics sectors.

Over the period 2000-2002, the Government aims to achieve the following goals and objectives:

i. Achieving an average economic growth rate of at least 3.0 percent by the promotion of a broad-based growth strategy;

ii. Increasing the level of public sector savings to a minimum of 8.0 percent of GDP, with central government savings being at least 5.0 percent of GDP;

iii. Increasing the level of domestic savings, as a percentage of GDP from around 9 percent in 1999 to around 13 percent by 2002;

iv. Achieving an investment to GDP ratio of around 26 percent;

v. Maintaining a sustainable current account deficit on the balance of payments, averaging no more than 15.0 percent of GDP;

vi. Increasing the level of productivity;

vii. Reducing the level of unemployment and poverty;

viii. Protecting the environment in order to safeguard the country's natural resource base and ensure that development is sustainable.

The achievement of these goals and objectives will require a broad based economic and social strategy that is underpinned by private sector investment, the continued pursuit of sound macroeconomic and trade policies, enhanced efficiency in resource mobilization, and a Public Sector Investment Programme (PSIP) that is focused and of adequate size and composition. Government is committed to the following measures over the medium term, some of which are already being implemented:

i. Improving the incentives framework to stimulate private sector investment;

ii. Continuing its tax reform programme in order to optimize the structure of the tax base and improve the efficiency of tax collection;

iii. Stringent expenditure management policy;

iv. Improving the human resource base of the country;

v. Maintaining, modernizing and strategically expanding the country's infrastructure;

vi. Improving the access of the wider population to basic social services and amenities;

vii. Implementing a poverty reduction strategy and plan;

viii. Implementing the National Environmental Action Plan;

ix. Introducing an integrated approach to national development planning;

1.10 ENERGY

The sustained growth in the economy over the past decade has resulted in an increasing demand for energy. This demand is further exacerbated by rapid growth in the energy intensive tourism sector, which has replaced agriculture as the leading economic sector.

Saint Lucia relies almost exclusively on imported fossil fuels to meet it energy needs. Of the total annual consumption of 109642.64 TOE (Tons of Oil Equivalent) in 2000, only an estimated 1 %, was met from indigenous sources, mainly in the form of firewood, charcoal and agricultural residues. As with all small, non-industrialized economies, the main consumption sectors are in electricity generation (28%), and transport (24%).

All electricity in Saint Lucia is generated from diesel-fired plants. Recent economic growth has resulted in a sustained increase in demand of 4.3% over the past decade.

Table 1.3 Growth trend in energy consumption for the main fuels for the period 1995 to 2000.

Year	2000	1999	1998	1997	1996	1995
Gasoline (IG)	11,771,342	11,835,765	5,728,680	11,266,099	1,139,477	9,841,517
Diesel (IG)	4,460,962	2,875,050	2,016,278	3,920,100	3,661,636	3,788,157
LPG (lbs)	14,274,342	26,654,638	17,588,144	7,868,789	13,801,072	11,768,702
Kerosene (IG)	103,391	114,377	72,400	70,692		
AV-Jet	6,039,984	7,051,966	705,329	81,940	3,689,019	4,564,975
Av-Gas	57,326	41,926	34,523	55,170	64,350	93,288

Table 1.4 Growth trend in the major sectors for the period 1995 to 1999.

YEAR	1999		1998		1997		1996		1995	
	MWh	%	MWh	%	MWh	%	MWh	%	MWh	%
Domestic	79,491	36.8	75,639	38.0	69,617	38.5	66,663	39.7	62,668	38.4
Commercial & hotels	120,628	56.9	108,618	54.6	97,248	53.8	86,518	52.4	86,683	52.5
Industrial	12,271	5.7	11,640	5.9	11,287	6.2	10,860	6.6	12,697	7.8
Street lighting	3,271	1.5	2,931	1.5	2,605	1.4	2,185	1.3	2,282	1.4
Total sales	215,661	100	198,828	100	180,757	100	165,216	100	163,330	100

There has been a concerted effort to promote the increased utilization of renewable energy on the island. This has been evident in the removal of duty and consumption tax on solar water heating units and other renewable energy technology. Feasibility studies on solar, wind and geothermal energy potential are ongoing. To this end, a comprehensive energy plan has been developed to address issues of price stability, quality, security of supply, efficiency of consumption, generation and distribution; renewable energy use and environmental impacts; utility regulations, clean energy technologies, and obligations under international agreements such as the UNFCCC.

1.11 TRANSPORT

The rapid growth in the transport sector in recent years is a direct result of the availability of used vehicles on the market. Between the period 1994 and 1999, the number of registered vehicles on the island increased from 21,388 to 33,563, a percentage increase of some 56.92%. As a result, there is growing congestion on the roads, resulting in unnecessarily high fuel costs, air quality concerns and increased greenhouse gas emissions from this sector. In an effort to address this problem, Government has increased investments in the Transport and Communications Sector from EC$134 million for the previous period, to EC$155 million for the 2000 – 2002 triennium. In addition, Government has offered incentives to the public transport sector to encourage its further growth.

NATIONAL INVENTORY OF GREENHOUSE GASES FOR ST. LUCIA

2.1 INTRODUCTION

St. Lucia, a Non - Annex 1 Party to the United Nations Framework Convention on Climate Change (UNFCCC), undertook an Inventory of its Net Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gases (GHG's) not controlled by the Montreal Protocol, to the extent of its capacities and in compliance with Articles 4 and 12 of the UNFCCC. The inventory was conducted in accordance with the Inter-Governmental Panel on Climate Change (IPCC) Guidelines of 1996.

This Chapter provides a description of the appropriate methodologies used and an analysis and interpretation of the data generated on anthropogenic GHG emissions and sinks, on a sector-by-sector basis, for St. Lucia. Following on the recommendation of the IPCC Revised (1996) Guidelines and based on the availability of most recent data, the Reference Year chosen for the Inventory for St. Lucia is 1994.

The Inventory of the following main Greenhouse Gases (GHG's) was conducted for St. Lucia: Carbon Dioxide (CO_2), Methane (CH_4) and Nitrous Oxide (N_2O). Indirect greenhouse gases that contribute to Tropospheric Ozone (O_3) formation, such as Non-Methane Volatile Organic Compounds (NMVOC), Carbon Monoxide (CO) and Nitrogen Oxides (NO_x) were also included in the inventory.

The IPCC Revised 1996 Guidelines for National Greenhouse Gas Inventories (Volumes 1,2 and 3) together with the accompanying Software in Microsoft Excel were used as the basis to undertake the necessary calculations on GHG Emissions and Removals.

The GHG Inventory was done on an individual sector basis for the Energy; Industrial Processes; Agriculture; Land Use, Land Use Change and Forestry (LULUCF); and Waste Sectors. The Solvents Sector, for which the IPCC methodology is not yet available, was not done.

In accordance with the Guidelines set out by the IPCC, Carbon Dioxide emissions from International Bunkers and burning of Biomass are not included in the national totals, but are reported separately as Memo Items in the Inventory.

For purposes of verification and transparency, the Inventory for St. Lucia includes the completed relevant IPCC Worksheets for all Sectors, in addition to the Summary Report Sheets, used to prepare the Inventory Report (provided as Appendices to this report).

2.2 ENERGY SECTOR

Methodology

Both the aggregate fuels supply-based top-down Reference Approach and the policy-oriented source categories bottom-up Sectoral Approach were used to calculate the GHG Inventory for the Energy Sector.

There is no production of primary and/or secondary fossil fuels in St. Lucia. Secondary liquid fuels including gasoline, jet kerosene, gas oil/diesel, residual (heavy) fuel oil (bunker C) and LPG are imported for local consumption (See Table 1).

Energy is produced through the combustion of these secondary fuels for use in the power-generating utilities, transport, agriculture/fishing, manufacturing, commercial, residential, tourism and international bunkers sectors.

Local activity data for the fuels imported and supplied were converted from tonnes of oil equivalent (toe) to an appropriate unit so as to facilitate the direct application of the IPCC Conversion Factor (TJ / kt) in order to derive the Apparent Consumption in TJ. In most cases, due to lack of country-specific data, the Default Values for the Conversion, Emission and Carbon Oxidation factors as furnished by the IPCC, when available, were used. In certain instances, for example for the Conversion Factor for solid biomass (charcoal, Agricultural Residue and Firewood), default values were extracted from countries of similar characteristics or from the same geographical area.

Table 2.1 Supply (Import) of Fuels (TOE) for St. Lucia in 1994

Fuel Imports Categories	Fuel consumption (TJ)	TOE (10^6)
Gasoline	0.03	0.036
Jet Kerosene	0.0006	0.02
Gas / Diesel Oil	0.05	0.05
Residual Fuel Oil	0.01	0.001
LPG	0.004	0.006
Bitumen	0.0003	0.0006
Lubricants	0.001	0.001
Other Oil-Spraytex	0.002	0.003

CO_2 Emissions from Energy Combustion

Combustion of fossil fuels in the Energy Sector is the main source of CO_2 emissions in St. Lucia. Data analyses of CO_2 emissions using both the aggregate Reference and differentiated Sectoral approaches show that in 1994, CO_2 emissions totaled 265.95 Gg (Reference) and 268.25 Gg (Sectoral) for St. Lucia. The Reference and Sectoral approaches both agree to within less than 1 % and this is an indication of the consistency and accuracy of the data and the calculations (See Table 2.2).

Table 2.2 CO_2 Emissions from Energy Sources according to Reference and Sectoral Approaches for St. Lucia in 1994

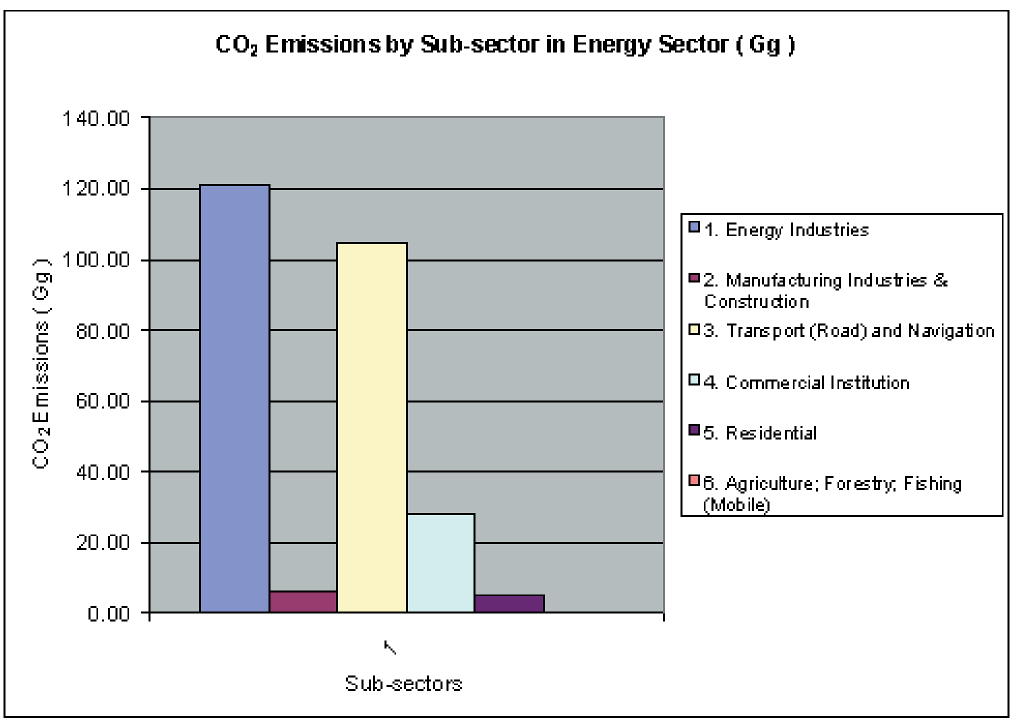
Reference Approach (Gg)	266
Sectoral Approach (Gg)	268
Difference	< 1 %

Of the fuels imported into st. Lucia, the greatest proportions of CO_2 emissions result from the combustion of Gas/Diesel Oil (58.0 % in 1994) used almost exclusively for thermal electricity production, and from Gasoline (35.0 % in 1994) mainly for vehicular road transport, but also for agriculture and fishing. Smaller amounts of CO_2 emissions also result from LPG use (3.43 % in 1994) in the residential and industrial sectors and from Residual Fuel Oil (1.53 % in 1994). The other fuels, including Jet Kerosene, Other Kerosene, Bitumen, Lubricants and Other Oil - Spraytex account for minimal amounts of CO_2 emissions (See Table 2.3 and Figure 1).

Table 2.3 CO_2 Emissions from Energy Sources and Fuel Combustion Categories

FUEL	Gg CO^2	%
Gasoline	94,52	35
Jet Kerosene	0	0
Other Kerosene	1,7	0,63
Gas / Diesel Oil	156,78	58
Residual Fuel Oil	4,14	1,53
LPG	9,28	3,43
Bitumen	1,37	0,5
Lubricants	1,73	0,64
Other Oil - Spraytex	0,83	0,31
Total	270,35	100
Memo Items		
International Bunkers	67,79	77,4
Solid Biomass	19,94	22,60

Figure 2.1 CO_2 Emissions (Gg) by Fuel Types for St. Lucia, 1994, Reference Approach.



Within the Energy Sector, CO_2 Emissions from the Energy Industries Sector totaled 121 of CO_2 Gg in 1994, which accounts for 46 % of the total CO_2 emissions. A further 104.66 Gg of CO_2, which represents 39.0 % of total CO_2 emissions in the Energy sector was produced by the Transport and Navigation Sector in 1994. Smaller amounts of CO_2 emissions were derived from the Commercial/Institutional (28.32 Gg: 11 %), Manufacturing Industries/Construction (6.0 Gg: 2 %), and Residential (5.04 Gg: 2 %) sub-sectors in 1994 (See Table 2.4 and Figures 2.2 and 2.3).

In addition, a further 88 Gg of CO_2 was emitted by International Bunkers and Biomass (See Table 2.4 and Figure 2.2).

Table 2. 4. CO_2 Emissions by Sub-sectors within the Energy Sector: 1994 (Sectoral Approach)

Sectors	1994
1. Energy Industries	121
2. Manufacturing Industries & Construction	6
3. Transport (Road) and Navigation	105
4. Commercial Institution	28
5. Residential	5
6. Agriculture; Forestry; Fishing (Mobile)	0,1
7. Total	265
8. Memo Items: International Bunkers/Biomass	88

Figure 2.2 CO_2 Emissions (%) by sub-sector within Energy Sector, including Total and Memo Items, 1994

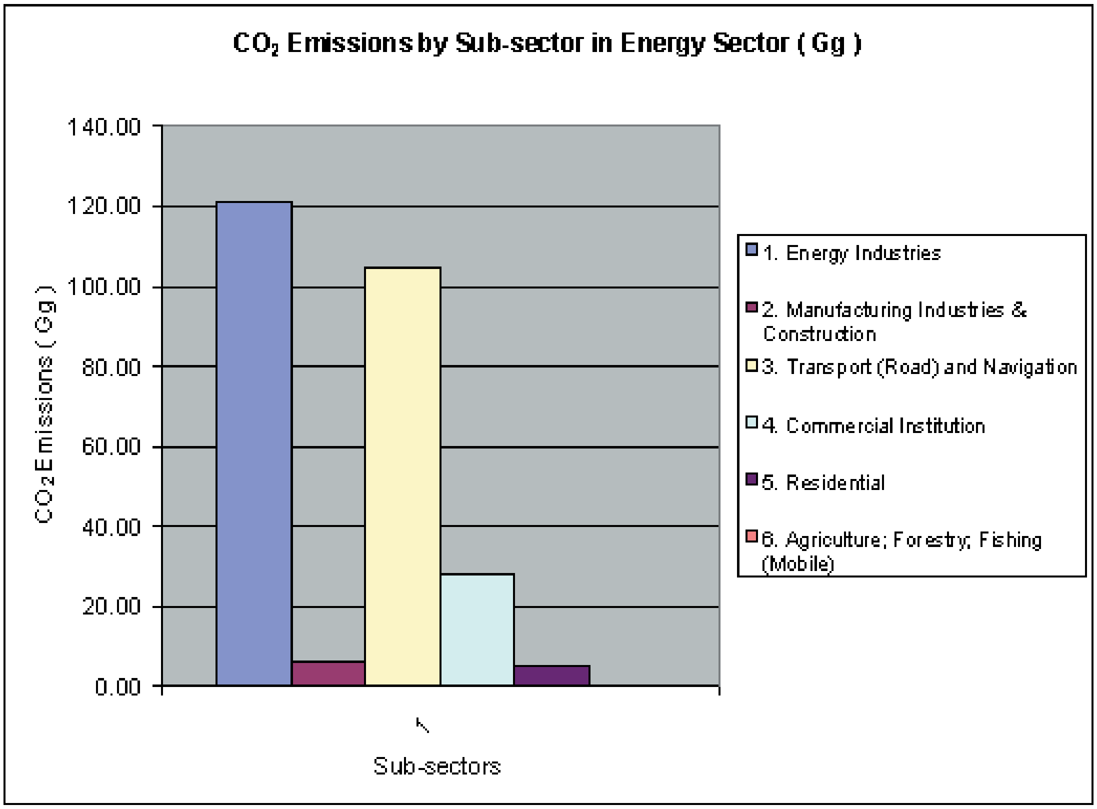
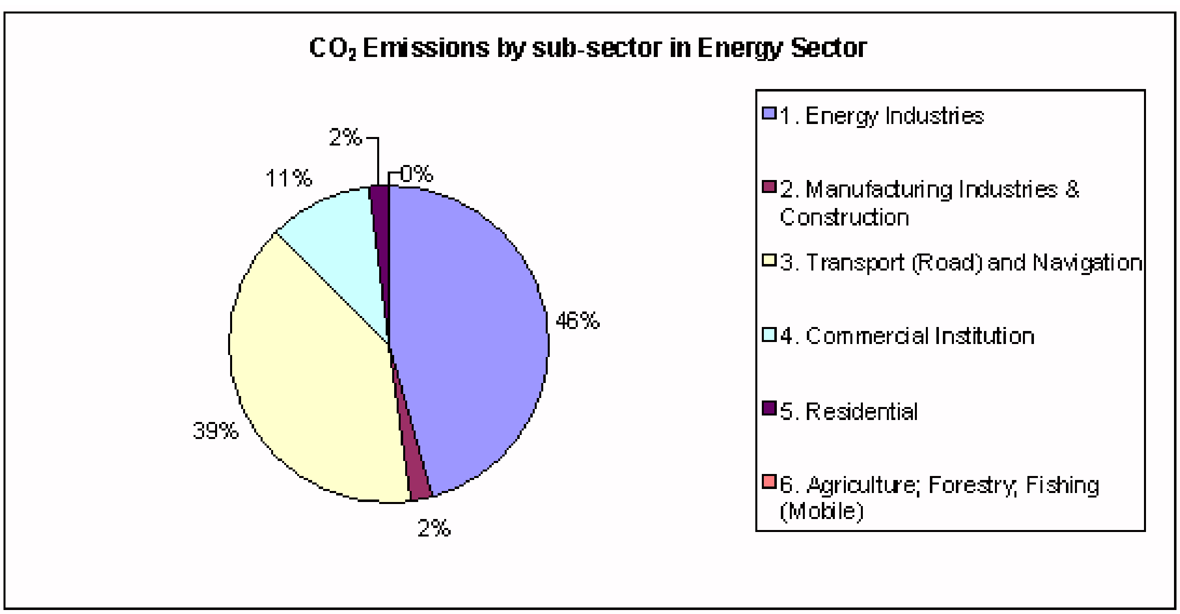


Figure 2.3 CO_2 Emissions (Gg) by Sub-sector within Energy sector excluding Memo Items, 1994



Non-CO_2 Emissions

Non-CO_2 emissions of Methane (CH_4), Nitrous Oxide (N_2O), Nitrogen Oxides (NO_x), Non-Methane Volatile Organic Compounds (NMVOC) and Sulphur Dioxide (SO_2) that derive mainly from the Transport, Energy Industries and the Residential sectors, are relatively small, being equal to or less than 1 Gg (except for NMVOC) for the Energy sector of St. Lucia in 1994 (See Table 2.5).

However, Carbon Monoxide (CO), derived mainly from the Transportation sector is comparatively high, exceeding 12 Gg in 1994. Also SO_2 emissions are estimated to be 0.607 Gg in 1994, with the highest emissions coming from the combustion of Diesel for thermal electricity production (Table 2.5).

Table 2.5 Non- CO_2 Emissions (Gg) from Fuel Combustion in Energy Sector

Non-CO^2 GHG Gases	(Gg)
CH_4	0,081
N_2O	0,003
NO_X	1,000
CO	12,009
NMVOC	2,000
SO_2	0.607

2.3 INDUSTRIAL SECTOR

By international standards, St. Lucia does not have a large Manufacturing or Industrial sector so that CO_2 emissions from light manufacturing or heavy industries are minimal. The Food and Beverage industry and Road Paving with Asphalt are the main emitters of GHG's in the form of NMVOCs and there is no Cement or Lime production taking place. The consumption and use of halocarbons for air-conditioning and refrigeration results in the release of some HFCs. There are also small emissions of SO_2 from the manufacture of pumice stone.

Methodology

NMVOC emissions derive from bitumen used in road paving asphalt, the manufacture of alcoholic beverages (rum and beer) and from food production (primarily bread and cakes; alcoholic beverages; and margarine and solid cooking fats)

HFC emissions (also reported under the Montreal Protocol) derive from the import and consumption of halocarbons, including leakage and disposal, in refrigeration and air-conditioning activities. SO_2 emissions are due to the limited production of pumice stone.

All activity data are country-specific and were obtained from the Department of Statistics, Government of St. Lucia. However, all emission factors were taken as Default Values from the IPCC Workbooks.

NMVOC Emissions

For the Inventory year 1994, NMVOC emissions from Road Paving Asphalt was 1.709 Gg, while from the manufacture of Alcoholic Beverages it was 0.218 Gg and from Food Production it was 0.040 Gg (See Table2.6).

SO_2 Emissions

SO_2 emissions from the production of pumice Stone were very minimal (0.0000005 Gg) in St. Lucia for 1994 (See Table 2.7).

HFC Emissions

Although not obligatory under the UNFCCC Convention, Halocarbon emissions from HFC consumption and refrigeration assembly, operation and disposal are reported for 1994 for St. Lucia. Though small, HFC emissions were mainly due to refrigeration disposal (1.33 Gg) and halocarbon consumption (0.11 Gg) in 1994 (See Table 2.8).

Table 2.6 NMVOC emissions (Gg) from the Industrial Sector, 1994.

Activity	NMVOC Emissions (Gg)
Road Paving Asphalt	1.709
Alcoholic Beverages	0.218
Food Production	0.040
Total	1.967

Table 2.7 SO_2 emissions (Gg) from the Industrial Sector, 1994.

Activity	SO2 Emissions (Gg)
Production of Pumice Stone	0.0000005
Total	0.0000005

Table 2.8 HFC emissions (Gg) from the Industrial Sector, 1994.

Activity	Actual HFC Emissions (Gg)
Refrigeration Assembly Losses	0.000003
Refrigeration Operation - Leakage	0.003
Refrigeration Disposal	1.33
Fire Extinguisher	0.000004
Total	1.33
Activity	**Potential HFC Emissions (Gg)**
Halocarbon Consumption	0.11

2.4 AGRICULTURE SECTOR

The agriculture sector of St. Lucia is mainly focused on banana plantations (primarily for export markets) and on vegetable, root and citrus crops mainly for local consumption but also for export.

For the 1994 reference year, Methane (CH_4) and Nitrous Oxide (N_2O) are the only perceptible greenhouse gases emitted by the Agriculture Sector. CH_4 emissions are limited to emissions from Enteric Fermentation and Manure Management from animal stocks, and to small amounts of rice cultivation in flooded fields.

N_2O Emissions derive from nitrogen-rich Histosols, fertilizer application to cultivated soils, excretion from grazing animals, atmospheric deposition of NH_3 and $NO_{x,}$ and from leaching of agricultural soils.

Methodology

Activity data on animal population according to species, on rice cultivation for CH_4 and on agricultural soils for N_2O are country-specific and were obtained from the Ministry of Agriculture. However, emission factors for enteric fermentation and manure management, for rice paddies in the case of $CH_{4,}$ and for soil processes in the case of N_2O, were taken as default values from the IPCC Workbooks. Where this was not possible, as for instance emission factors for poultry, this was taken from other similar country reports.

CH_4 Emissions

In 1994, total annual CH_4 emissions from Domestic Livestock amounted to 0.49 Gg, the great majority (91%) coming from Enteric Fermentation (0.445 Gg), and the remainder coming from manure management (0.45 Gg) (See Table 2.9). Also, rice cultivation in flooded fields contributed an additional minute amount of 0.0008 Gg.

N_2O Emissions

Given the small surface area of St. Lucia, it is not surprising that emissions of N_2O from agricultural soils are very small. Total N_2O emissions in 1994 were less than 0.1 Gg and most of this came from leaching of agricultural soils (0.05 Gg) and from the excretions of grazing animals (0.0029 Gg) (See Table 2.10).

No data on the field burning of agricultural residues was available for the Reference Year, 1994. However, based on local expert judgment, it is believed that this activity is insignificant and that greenhouse gas emissions from this agricultural activity would be negligible. St. Lucia has no savannahs and this category was not applicable.

Table 2.9 CH_4 Emissions from Animal Stocks and Rice Cultivation in the Agriculture Sector

Activity	CH4 Emissions (Gg)
Enteric Fermentation	0.4
Manure Management	0.05
Rice Cultivation	0.001
TOTAL	0.5

Table 2.10 N_2O Emissions from Agricultural Soils in the Agriculture Sector

Activity	N_2OEmissions (Gg)
Cultivation of Agricultural fields	0.02
Cultivation of Histosols	0.03
Grazing Animals	0.003
Atmospheric Deposition of NH_3 and NO_x	0.0015
TOTAL	0.055

2.5 LAND USE, LAND USE CHANGE AND FORESTRY

St. Lucia, being a relatively small island (616 square kilometers), forest cover is of limited extent by global standards. Detailed data on Land-Use and Forestry are not available However, available data sets and expert estimations (Forestry Division, Government of St. Lucia) place total forest acreage, that is anthropogenically-impacted at 61,500 hectares, consisting mainly of Other Forests (39,756 hectares) including Mangroves (307.5 hectares), Moist Tropical Forests (12,444 hectares) and Seasonal Tropical Forests (8,820 hectares). The number of Non-Forest Trees could not be accurately estimated given currently available data. However, based on local expert judgment, changes in these acreages over the last 20 years are not expected to be very substantial.

Methodology

Activity data on Species and Areas (hectares) of forest/biomass stocks, on Annual Growth Rate (t dm/ha) of forests and other trees and savannas and on Commercial Harvest (m^3) are country-specific and were obtained from the Forestry Division of the Government of St. Lucia as well as to a limited extent from FAO Statistical data. However, Conversion and Emission factors relating to Carbon Fraction, Biomass Conversion/Expansion and Fraction of Biomass Oxidized were taken as Default values from the IPCC Workbooks. Furthermore, where published data was lacking, as for instance fraction of biomass burned on-site and off-site, these were estimated based on data from other countries in the region.

CO_2 Emissions / Removals

CO_2 Emissions and Removals from the Land Use, Land-Use Change and Forestry sector derive primarily from depletions in forest and other woody biomass stocks through logging and other activities such as charcoal manufacture, leading to emissions of CO_2; from carbon uptake due to regrowth through conversion of forests and grasslands; from emissions from forest and grassland conversion due to burning and decay of biomass; and from carbon release from forest soils. In recent decades some deforestation has occurred due to the production of fuel wood constituting emissions from off-site burning.

The data analyzed for St. Lucia for the year 1994 shows a removal of 516.06 Gg of CO_2 due to growth Changes in Forest and Other Woody Biomass Stocks. Because of the lack of reliable data, removal of CO_2 due to regrowth by the Abandonment of Managed Lands is not estimated. Based on local expert judgment, this activity has been minimal, at least over the last 20 years, and emissions, if any, would be insignificantly small.

On the other hand, Forest and Grassland Conversions account for 68.06 Gg of CO_2 emitted through burning and decay of biomass. A further 95.89 Gg of CO_2 were emitted through Carbon Release from Forest Soils.

This results in a Net Removal (Sink) of 352.11 Gg of CO_2 from Land Use Change and Forestry in St. Lucia. (See Table 2.11 and Figure 2.4).

Table 2.11. CO_2 Emissions and Removals and Net/Sink (Gg) for Land Use, Land-Use Change and Forestry Sector

Activity	Removals	Emissions	Net / Sink
Changes in Forest and Other Woody Biomass Stocks	- 516.06	_	_
Forest and Grassland Conversion	_	68.06	_
Carbon Uptake from Abandonment of Managed Lands	_	_	_
Carbon Release from Forest Soils		95.89	
Net Source / Sink	_	_	
Total	- 516.06	163.95	- 352.11

Non-CO_2 Emissions

Because of the relatively limited land area (616 km ^{2}) trace gas emissions of Methane (CH_4), Nitrous Oxide (N_2O) and Nitrogen Oxides (NO_x) due to burning of biomass are negligible and Carbon Monoxide (CO) emissions are the only ones of any significance being of the order of 2.6 Gg (See Table 2.12)

Table 2.12 Non-CO_2 Emissions from the Land Use and Forestry Sector, 1994

GAS	Emission (Gg)
CH_4	0.29700
CO	2.59875
N_2O	0.00204
NO_x	0.07380

2.6 WASTE SECTOR

In the Waste sector, greenhouse gas emissions are limited to Methane (CH_4) from Solid Waste Disposal Sites (SWDS) and to indirect Nitrous Oxide (N_2O) emissions from Human Sewage.

Solid Waste Disposal was limited to two landfills located in the north and south of the island respectively. A large part of this waste is buried for decomposition. There are also small, uncontrolled open dumps scattered in the rural areas but the volumes involved are very small and are therefore not included in the Inventory.

Methodology

Activity data pertaining to Municipal Solid Waste (MSW) disposed to SWDSs are country-specific data obtained from the St. Lucia Solid Waste Management Authority. Per capita waste generation rates were determined based upon current waste arrivals recorded at the landfill. It was assumed that the waste generation rates would have not varied significantly between 1994 and 1998. Using waste arrivals at the landfills for 1994 may be fairly accurately deduced, or are at worst slightly overestimated. However, the IPCC Default values for Methane Correction factor, Fraction of DOC in MSW, Fraction of DOC that degrades and Fraction of Carbon Released as methane were used for the estimation of Methane emissions from solid waste disposal systems.

CH_4 Emissions

Data analyses using the above methodology provide Net Annual Methane Emissions from Solid Waste Disposal Sites of 27.79 Gg in 1994 for St. Lucia (see Table 2.13).

Table 2. 13 CH_4 and N_2O Emissions from the Waste Sector

Activity	CH4 Emissions (Gg)	N2O Emissions (Gg)
Solid Waste Disposal on Land	27.79	-
Sewage	-	0.02

Industrial and Domestic Wastewater Handling

Arising out of the small population of the country and the limited number of industries and commercial activities, the treatment and disposal of industrial, commercial and domestic wastewater is comparatively small and with very limited available data. There is little or no anaerobic treatment of wastewater. Although there are small treatment ponds for raw sewage at Castries and at Gros-Islet, no degradable organic carbon is removed as sludge. Hence, estimates of Methane emissions from Industrial and Domestic Wastewater for 1994 were not possible and are not recorded in the Inventory.

In St. Lucia, municipal sewage is generally sent via conduits to the deep ocean. Only parts of St. Lucia, including the capital city of Castries and some of the suburban districts receive sewerage treatment services. This is provided through the only sewerage treatment plant located at Rodney Bay in Gros-Islet in the north of the island. Sewerage for an estimated 6.3 % of the total population of St. Lucia (estimated at 142,689) is treated at the Rodney Bay Plant. Out of the remaining 93.7 % of the population, approximately 32.01% are estimated to use septic tanks and the remainder use pit latrines. This data is obtained from the 1994 population census.

Methodology

Nitrous oxide (N_2O) emissions from Human Sewage were estimated from country-specific data on Population and Per Capita Protein Consumption (kg/person/yr) as obtained from the Central Statistics Department, Government of St. Lucia.

The IPCC Default factors for Fraction of Nitrogen in Protein and Emission of N_2O were used to estimate the emissions of N_2O from Human Sewage.

N_2O Emissions

Nitrous Oxide (N_2O) emissions in St. Lucia were estimated to be 0.02 Gg in 1994. Thus, N_2O emissions in St. Lucia are very low (See Table 2.13).

Other sources for this greenhouse gas are from agricultural activities such as synthetic fertilizers usage and field burning of crop residues. Organic amendments to soil are done on a very small scale. This is believed to be primarily related to kitchen gardens so that N_2O emissions from these sources are considered relatively insignificant.

2.7 MEMO ITEMS

The current IPCC methodology requires that emissions from **International Bunkers** and **Biomass** be reported separately in the **GHG Inventory** of a country.

CO_2 Emissions from international bunkers

Emissions from international bunkers are limited to emissions from jet kerosene sold to aircrafts that fly internationally and to marine international bunkers. CO_2 emissions from aviation international bunkers for the year 1994 were calculated using the IPCC Tier 1 approach. The results are reported in Table 2.3. CO_2 emissions totaling **67.79** Gg of CO_2 in 1994, included under **Memo Items** and not credited to St. Lucia's emissions of CO_2, result from the combustion of Jet Kerosene for **International Aviation** (**60.83** Gg in 1994) and of Gasoline for **International Marine Bunkers** (**6.96** Gg in 1994)

CO_2 emissions from biomass fuels

In St. Lucia biomass fuels that are burned for energy are primarily firewood, charcoal and some agricultural waste. Table 2.3 gives total CO_2 emissions from biomass fuels (firewood, charcoal) for 1994 in Gg.

An estimated 19.94 Gg of CO_2, also considered as a Memo Item, results from the combustion of Solid Biomass, namely charcoal firewood and agricultural residue, used primarily for cooking in the residential sector (See Table 2.3 and Figure 2.1).

2.8 SOURCES OF UNCERTAINTY

It follows from the above that the calculations of sources and sinks of GHG's for the different sectors, as described above, necessarily incorporate various levels of uncertainty with respect to the country activity data as well as the various conversion and emission factors.

Energy Sector

The main source of uncertainty is the partitioning of the total fuels used in the different sub-sectors. This somewhat limits the results of the Sectoral Approach. However, for the Reference Approach, where the total fuels used are lumped together, there is lesser or very little uncertainty. All activity data has been sourced locally from the Government of St. Lucia, which produces the annual energy balance for the island.

Another source of uncertainty in the Energy Sector, regarding activity data, is with respect to the Memo items. For International Marine Bunkers, for instance, uncertainties exist since the data was partly estimated. Also, country statistics on charcoal and firewood (Biomass) burning were estimated. As for the emission factors for the various greenhouse gases (CO_2, CH_4, N_2O, NO_x, CO, NMVOC), the IPCC default values (mostly Tier 1) were used in almost all instances, since country–specific measurements are not available.

Industrial sector

Greenhouse gas emissions in this sector are restricted to NMVOC in the Road Paving and Alcoholic Beverages and Food Production industries, to SO_2 emissions from the manufacture of pumice stone, and to HFCs emission from refrigeration and air-conditioning systems. Activity data for these were obtained primarily from the Department of Statistics so that uncertainties are minimal. However the NMVOC emission factors are based on the IPCC default values, which may be somewhat unrepresentative based on the age and condition of the factories. Here again, country specific conversion factors are not available.

Agriculture Sector

Several areas of uncertainty were encountered. Government statistics and expert judgment were used to obtain estimates of some animal populations since existing data did not address all types of livestock. Additionally, no data was available on the field burning of agricultural residues as this does not occur on any statistically significant scale, being used only in certain households as fuel. Consequently this activity was not recorded.

Land Use, Land Use Change and Forestry

There are a number of uncertainties relating to greenhouse gas emissions and removals in this sector. There was a difficulty in assessing the fraction of the forested area which was anthropogenically impacted. In St. Lucia, selective logging is done mainly for lumber and charcoal production. As a result determining the actual area disturbed from logging operation was somewhat difficult. There was also a lack of data on the number of non-forested trees. This category of forest represents a significant area of the island, but could not be captured due to lack of data.

With regards to emission and conversion factors, the IPCC default values were used. Given the very general nature of these default values, country-specific values such as annual growth rate of forests may be quite different and this could mean significant uncertainty in the GHG emissions and removals calculations for this sector.

Data on abandonment of managed lands was not available. However, initial assessment based largely on expert judgement indicates that this will be insignificant. Hence, it was not considered in the inventory.

Waste Sector

The methodology utilizes population statistics for urban areas and this was used in the calculation of CH_4 emissions from solid waste disposal sites. Under worksheet 6-1C (Supplement) default values for Methane Correction Factor were used. Regarding the continued use of some illegal dump sites it was estimated that the percentage of waste reaching the official landfill is approximately 80%-85%. The percentage error in this approximation may be as high as ±10%. There is also high uncertainty since the actual amount of waste deposited in disposal sites was not used because there was no data available.

In the case of N_2O emissions from human sewage, the IPCC default values were used. This may not be applicable to St. Lucia and is a source of uncertainty. Also, the per capita protein consumption value used was derived from Department of Statistics “Crude Estimates of Food Availability”, and this could also be a source of uncertainty.

Furthermore, although there are both domestic and industrial sources of wastewater in St. Lucia, CH_4 emissions were not calculated because there is no anaerobic treatment of wastewater.

Summary of Uncertainties

In summary, the GHG emissions and removals for St. Lucia for the different sectors were calculated using available data and expert judgment. However, it must be cautioned that there are uncertainties in these estimates and the degree of uncertainty varies between sectors with the highest levels of certainty being in the Energy Sector. Strengthening data collection capacities through technical cooperation and exchange will be an important requirement in enabling St Lucia to more accurately meet it's future obligations under Articles 4 and 12 of the UNFCCC.

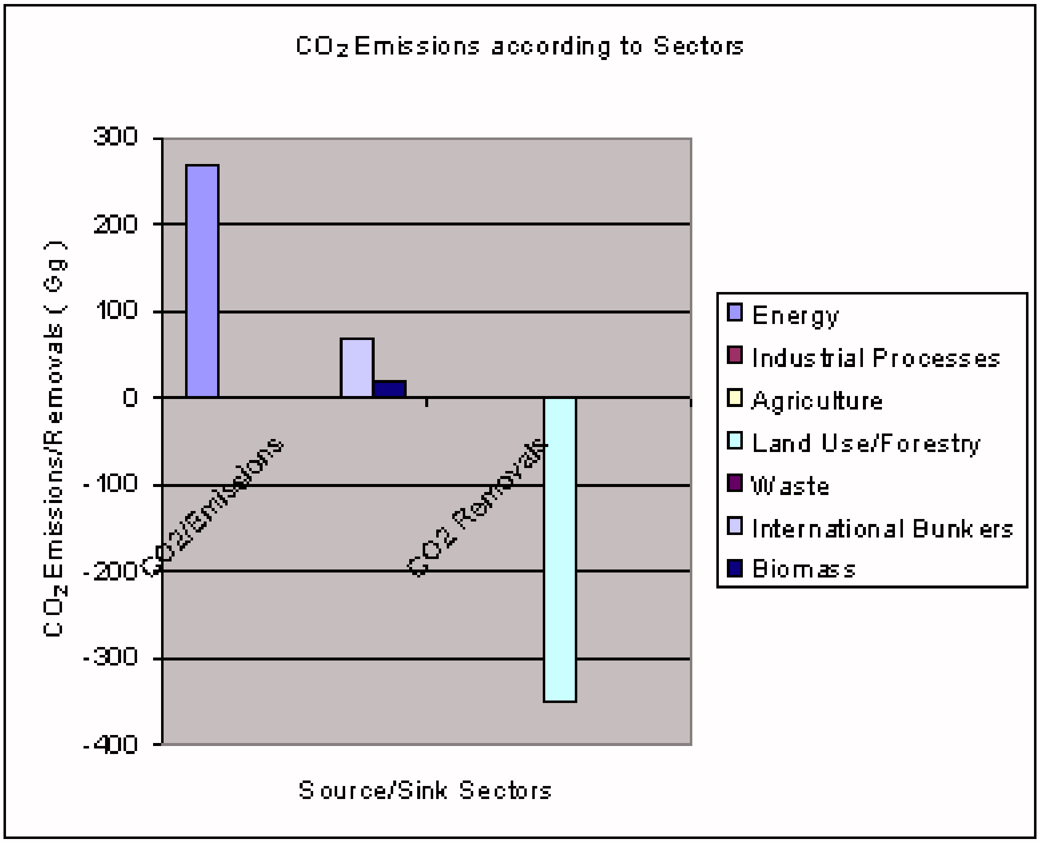
2.9 SUMMARY OF EMISSIONS AND REMOVALS

A Short Summary of the major Emissions by Sources and Removals by Sinks on a sector-by-sector basis for St. Lucia for the Reference year 1994 is provided in Table 2.14 and Figures 2.4 and 2.5.

Table 2.14. CO_2 Emissions and Removals by Sector

Greenhouse Gas Source and Sink Categories	CO_2/Emissions (Gg)	CO_2/Removals (Gg)
Energy	268	0
Industrial Processes	0	0
Agriculture	0	0
Land- Use Change and Forestry	164	-506
Waste	0	0
Total National Emissions and Removals	432	-506
Memo Items		
International Bunkers	68	0
$C0_2$ Emissions from Biomass	20	0

Figure 2.4 CO_2 Emissions and Removals (Gg) by sectors



IT IS EVIDENT THAT THE MAJOR SOURCE OF CO_2 emissions is from the Energy sector (268 Gg), which accounts for virtually all of the net CO_2 emissions.

The Land Use and Forestry sector, which is also responsible for some amount of CO_2 emissions, through Forest and Grassland Conversion (68.06 Gg) and Carbon Release from Forest Soils (95.89), is a Net Sink with Net removals amounting to 352.11 Gg. Removals of CO_2 due to Growth Changes in Forest and Other Woody Biomass Stock equaled 516.06 Gg of CO_2 and this was the major contributing factor to overall net removals (See Table 2.14 and Figure 2.4).

Also Memo Items, namely International Aviation and Marine Bunkers (68.0 Gg CO_2) and Burning of Biomass (charcoal) (20.0 Gg CO_2) account for further CO_2 emissions although not regarded as a part of the total national GHG emissions and removals.

Non- CO_2 Emissions Emissions/Removals

Comparatively smaller amounts of Non-CO_2 greenhouse gases were emitted or removed in St. Lucia for the year 1994 (See Table 2.15 and Figure 2.5).

CH_4 emissions, which totaled 28.67 Gg, derived mainly from Landfills in the Waste Sector (27.8Gg CH_4) and from Enteric Fermentation and Manure Management (0.3 Gg CH_4) from the Agriculture Sector (See Table 2.15 and Figure2.5).

N_2O emissions on the other hand are mainly restricted to emissions from Agricultural Soils in the Agriculture sector (0.048 Gg N_2O) and from Human Sewage (0.18 Gg N_2O) in the Waste Sector (See Table 2.15 and Figure 2.5).

NO_x emissions derived almost exclusively from the Energy Sector, as emissions in the Transport sub-sector (See Table 2.15 and Figure 2.5).

Similarly CO emissions derived mainly from the Energy Sector from Transport vehicles (12.0 Gg CO) and to a lesser extent from Forest Conversion (2.6 Gg CO) in the Land Use and Forestry sector (See Table 15 and Figure 2.5).

NMVOC emissions derive mainly from Road-Paving Asphalt and the Food and Beverage industries in the Industrial sector (2.11 Gg NMVOC) and from Fuel Combustion (1.96 Gg NMVOC) in the Energy sector (See Table 2.15 and Figure 2.5).

The only other significant GHG in St. Lucia in 1990 was SO_2 (2.83 Gg), which was emitted through the combustion of Gas/Diesel Oil, Residual Fuel Oil and Gasoline in the Energy sector (See Table 2.15 and Figure 2.5).

Finally, HFCs were emitted exclusively from the Industrial Sector (1.44 Gg HFCs) in the Refrigeration and Air-conditioning industries (See Table 15 and Figure 5).

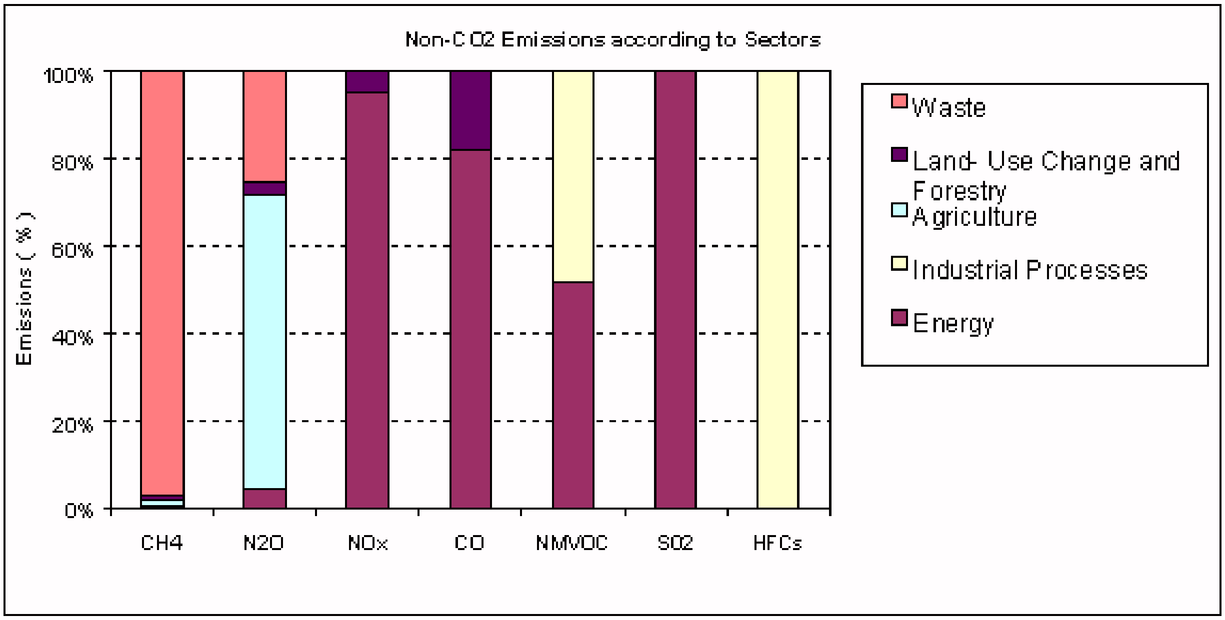
Table 2.15 Non- CO_2 Emissions and Removals by Sector (Gg)

Greenhouse Gas Source and Sink Categories	CH_4	N_2O	NO_x	CO	NMVOC	SO_2	HFC_s
Energy	0,1	0,003	1	12	2	3	0
Industrial Processes	0	0	0	0	2	0	1
Agriculture	0,5	0,05	0	0	0	0	0
Land- Use Change and Forestry	0,3	0,002	0,1	3	0	0	0
Waste	28	0,02	0	0	0	0	0
Net National Emissions	29	0,07	1	15	4	3	1
Memo Items							
International Bunkers	0	0	0		0	0	0
$C0_2$ Emissions from Biomass	0	0	0		0	0	0

Table 2.16. Non- CO_2 Emissions and Removals by Sector (Global Warming Potential)

Greenhouse Gas Source and Sink Categories	CH_4	N_2O	HFCs
Energy	2,1	0,93	0
Industrial Processes	0	0	1700
Agriculture	10,5	15,5	0
Land- Use Change and Forestry	6,3	0,62	0
Waste	588	6.2	0
Net National Emissions	609	21,7	1700

Figure 2.5 Non- CO_2 Emissions and Removals by Sectors



2.10 RECOMMENDATIONS

Based on the experiences of the preparation of the initial GHG inventory for St. Lucia, there is a need for future efforts to focus on training, research and data collection activities. There is the need for strengthening local capacity to undertake future inventory compilations. Also, there is need for research in such areas as forest species coverage, using remote sensing and GIS tools and methods.

There is also the need to establish institutional focal points for coordinating inventory preparation and for data collection at the sectoral level, particularly for non-energy sectors where important gaps remain in certain areas. However, the most pressing need is for obtaining local data on emission factors in the various sectors.

NATIONAL CLIMATE CHANGE MITIGATION STUDY FOR ST. LUCIA MEASURES AND POLICIES

3.1 INTRODUCTION

Article 2 of the UNFCCC establishes that the ultimate objective of the treaty is the “stabilization of greenhouse gas concentrations … at a level that would prevent dangerous anthropogenic interference with the climate system”. Among the guiding principles to achieve this objective is that Parties to the Convention should “take precautionary measures to anticipate, prevent or minimize the causes of climate change.” At the same time the UNFCCC recognizes in its preamble that emissions of greenhouse gases from developing country parties, such as St Lucia, will necessarily grow as these countries embark on measures to meet their social and development needs. This is reinforced in Article 4.7 which recognizes that the extent to which developing country parties are able to meet their commitments under the UNFCCC will be dependent on a number of factors including the transfer of technology, and that the “first and overriding priorities” of developing countries will be the attainment of sustainable development.

The sources of greenhouse gases are intimately linked to economic sectors and activities. In St Lucia emissions of greenhouse gases stem primarily from electricity generation and vehicular transportation, as well as smaller amounts originating from changes in land use, agricultural production and waste management, with sinks being the islands forestry and other biomass resources as well as its ocean space.

Most developed country parties to the UNFCCC have now developed climate change mitigation strategies. In many instances, however, developing countries are also implementing measures that, while designed primarily for purposes of advancing sustainable economic and social development, also contribute towards the goal of reducing emissions of greenhouse gases. This has been the case in St Lucia where a series of measures and initiatives have been implemented, or are planned, for promoting sustainable development which also serve to reduce emissions of greenhouse gases and to protect and enhance sinks.

3.2. PRESENT PATTERNS OF ENERGY USE

The GHG Inventory establishes the dominant share of the energy (particularly electricity) sector in contributing to St Lucia’s greenhouse gas emissions. At present the principal source of these emissions emanates from the generation of electric power for use in the country’s residential, tourism, industrial and commercial sectors. For its electricity, Saint Lucia relies on an installed capacity of 66.4 megawatts (MW) derived from three diesel-powered generating plants. Table 1 below illustrates existing consumption according to the major end-users.

Table 3.1 Sectoral Consumption of Electricity in Saint Lucia, 1995-1999

YEAR	1999		1998		1997		1996		1995	
	MWh	%	MWh	%	Mwh	%	MWh	%	MWh	%
Domestic Use	79,491	36.86%	75639	38.04%	69,617	38.51%	65,653	39.74%	62,668	38.37%
Commercial & Hotel Use	120,628	55.93%	108618	54.63%	97,248	53.80%	86,518	52.37%	85,683	52.46%
Industrial Use	12,271	5.69%	11640	5.85%	11,287	6.24%	10,860	6.57%	12,697	7.77%
Street Lighting	3,271	1.52%	2931	1.47%	2,605	1.44%	2,185	1.32%	2,282	1.40%
TOTAL SALES	215,661	100%	198,828	100%	180,757	100%	165,216	100%	163,330	100%

Growth in the Saint Lucian economy, driven largely by growth in the tourism sector, is resulting in a 4.31% annual net increase in demand for electrical power. As a consequence official projections from LUCELEC, the national utility responsible for electricity generation, transmission, and distribution, forecast the need for an additional 33.3MW in generating capacity over the next 10 years if the nation is to have adequate energy to meet future demands.

One of the principal concerns relates to ensuring the availability of commercial energy supplies at reasonable costs while minimizing environmental costs. This is particularly important since St Lucia, like most Caribbean island States, is a relatively high cost electricity producer reflecting the lack of economies of scale and the proportionately high costs imposed by the islands topographic conditions. The significance of maintaining reasonable costs of electricity production is especially critical given the need for the country to remain competitive with other international tourism destinations, and with other industrial and agricultural producers.

In terms of availability of supplies, St Lucia like most small island developing States is presently dependent on imported fuels for the overwhelming majority of its energy supplies. This makes it important that the country seek as far as possible to sustainably develop it's national energy capabilities and resources if it is to aim towards a greater measure of control over vital energy inputs into its social and economic development.

Another area of primary concern is to ensure that energy production, distribution and consumption do not contribute to environmental degradation. This is important given the country's small size and its dependence on the maintenance of its natural resources for economic growth and development, particularly in the vital tourism and agricultural sectors.

A particular set of concerns in St Lucia relates to the growth of emissions emanating from the transport sector – the country's second principal source of greenhouse gas emissions. Growth in this sector has been especially rapid, responding to an overall increase in levels of disposable income as the economy has expanded based largely on growth in the tourism and agricultural sectors. As the IPCC has noted in its report on technology transfer, the transportation sector presents special challenges for climate change mitigation arising out of its dependence on fossil fuels and the unique role that transport plays in satisfying various personal, social, economic and developmental goals. In the case of small island developing countries like St Lucia, an additional complicating factor is the virtually total dependence on imported technologies for satisfying commercial transportation requirements.

Growth in St Lucia's transport sector, and the accompanying increase in GHG emissions, while perhaps an inevitable feature of present patterns of economic development, has not however come without costs. In particular there has been an increasing outflow of financial resources to purchase imported vehicles, fuels and other required inputs. Other costs include lost productivity brought about by the ever-increasing traffic congestion on St Lucia's road network; and increasing problems of pollution associated with disposal of waste oils, old vehicles and other components.

Based on present patterns of consumption as well as projections for future population and economic growth, the following energy sector baseline has been developed by the Ministry of Planning and other stakeholders in St Lucia for the energy sector through to 2010.

- Current installed capacity of 66.4MW with a peak demand of 43 MW, with the average base load at 26.6 MW. All installed capacity is derived from diesel-powered generators.
- Installed capacity in 2005 will be 79MW (21.3 MW additional diesel-powered generating capacity); peak demand in 2005 will be 53.6 MW.
- Installed capacity in 2010 will be 91 MW (33.3 MW additional diesel-powered generating capacity); peak demand in 2010 will be 65.6 MW.

- Universal electricity coverage of the residential sector will be achieved by the year 2002. Electricity is currently available to approximately 98% of commercial and residential properties in the country.
- Current greenhouse gas emissions (GHG) from the electricity sector are 156,530 tons of Carbon.
- The projected GHG emissions from the sector in 2005 are 188,860 tons of carbon.
- The projected GHG emissions from the electricity sector in 2010 are 230,060 tons of carbon. In 1999, 82,214 barrels of diesel and 338,454 barrels of gasoline were consumed in the transport sector by a fleet of 33,563 vehicles. In 2010, 128 916.7 barrels of diesel and 643 130.7 barrels gasoline will be consumed by a fleet of 60,575 vehicles (no alternative-fueled vehicles are assumed for this baseline figure).

3.3 SUSTAINABLE ENERGY DEVELOPMENT PLAN

In response to the various concerns for development and management of the energy sector the Government of St Lucia has developed a Sustainable Energy Plan in conjunction with national, regional and international partners. Goals and objectives of the Plan, which hinges on the need for sustainability:

- Reducing projected electricity demand by 5% by 2005, resulting in a peak demand in 2005 of 51 MW, which will require an installed capacity of 75MW.
- Reduce projected electricity demand by 15% in 2010, resulting in a peak demand in 2010 of 55.7 MW, which will require an installed capacity of 77.4 MW.
- Deliver 5MW, or 7% of installed capacity, via renewable energy technologies by 2005.
- Deliver 17MW, or 20% of installed capacity, via renewable energy technologies by 2010.
- As a result of reductions in demand and increased use of renewable energy resources, reduce the annual consumption of diesel fuel for electricity generation to 436,579 barrels in 2005 (12% reduction from the baseline) and 392,823 barrels in 2010 (35 % reduction from the baseline.
- Reduction of annual GHG emissions from the electricity sector to 166,197 tons of carbon by 2005 and 149,539 tons of carbon by 2010.
- Reducing the consumption of gasoline and diesel fuel in the transportation sector to 122,471 barrels of diesel and 610 974 barrels of gasoline by 2005 (5% reduction) and 109,579 barrels of diesel and 546 661 barrels of gasoline (15% reduction) by 2010. These reductions are to be achieved by a combination of measures, including the increased use of public transportation, the introduction of high-efficiency vehicles, the deployment of a limited number of vehicles powered by alternative fuels, driver education and awareness to reduce fuel consumption, and improvements in road and traffic management.

In order to achieve these targets a number of research, policy and regulatory initiatives will be required. In many instances opportunities exist for strengthening collaboration with international funding and technical assistance agencies. Among the measures to be undertaken are:

a. Renewable Energy Resource Assessment

While considerable work has already been completed in identifying and assessing the potential for new and renewable energy development – particularly for geothermal energy resources – there is a need for additional assessment of these resources if they are to be commercially viable and be able to contribute towards the goals of greater sustainability of energy supply and use. In particular, additional site-specific assessments will be necessary in anticipation of locating new and renewable energy resources with the potential for commercial exploitation. In the area of wind-resource assessments, for example, both national wind mapping and site-specific monitoring activities are needed. The aim is the development of a data-base of renewable energy resources in St Lucia as an investment tool for enabling private and public sector investments especially with regard to wind, solar, biomass, geothermal, and mini-hydro sources of new and renewable energy.

b. Assessment of Energy Efficiency and Conservation Opportunities

Based on initial assessments, present patterns of electricity usage, particularly in the residential, tourism and commercial sectors would appear to have the potential for fairly substantial improvements in energy efficiency and conservation. In this regard an analysis/survey of the market potential for energy efficiency measures is also proposed. This will review generation and consumption patterns throughout the country and in each of the key sectors. These analyses will be used in the design of appropriate energy-efficiency measures and in efforts to attract entrepreneurial initiatives focused on energy savings. One possible element of this is the encouragement of support for establishment of Energy Service Companies (ESCOs) within the private sector and possibly even within the electric utility, for advancing commercially based initiatives for advancing electricity conservation.

c. Reform of the Electricity Sector

Many of the initiatives for improving the sustainability of energy use will require reform of the present institutional structures for electricity production and distribution in St Lucia. . A particular area of concern relates to the existing monopoly role of the electric utility which has often historically served as a barrier to utilization of renewable energy. Experience internationally has demonstrated that in some instances independent power producers with experience in renewable energy may be better suited to develop these resources. Therefore, policies and regulations that permit and encourage Independent Power Producers (IPPs) will be developed. Scope would also appear to exist for co-generation and the Government of Saint Lucia is also desirous of exploring financially viable options and policies that permit private sector entities to generate their own electricity while still maintaining continuous link to the power grid. This policy may also include a mechanism that permits self-generators to sell excess capacity back to the utility.

d. Capacity Building for Sustainable Energy

A number of measures will be needed to build the capacity of various stakeholders, within the electricity utility and at a wider level, to promote the use of new and renewable energy as well as for improving energy efficiency. It is recognized that among the principal impediments to the widespread use of renewable-energy technologies is the limited capacity of key decision makers and technicians. In addition, utility officials and engineers often lack the technical information necessary to select, develop and use sustainable energy options within their system. The aim is therefore to establish a comprehensive energy training initiative with the purpose of increasing the capacity to develop and utilize these systems among the utility staff and potential project developers. It is envisaged that this effort will be conducted in cooperation with the Caribbean Electric Corporation (CARILEC) as well as with other regional and international initiatives such as the Caribbean Renewable Energy Development Project (CREDP), an ongoing regional energy project receiving support from the Global Environment Facility (GEF).

e. Public Awareness

Central to the efforts to advance promotion and use of sustainable energy will be the need to improve awareness of the general public as to the opportunities that exist for achieving cost savings and environmental benefits from greater efficiency in energy use and from switching to already commercially available technologies such as solar (and to a lesser extent wind and photovoltaics). For example effective demand side management (DSM) programs in the electricity sector require well-designed and targeted campaigns that communicate to the population the need for, and potential benefits from, reducing consumption. In this regard the Government of St Lucia proposes the establishment of a comprehensive and integrated public awareness program for sustainable energy that seeks to advance in a holistic manner the need for integrating sustainable energy management into energy usage throughout the various sectors of the economy.

f. Establishment of a Renewable-Energy Feasibility and Project Investment Fund

It is recognized that the initial costs of investments in renewable-energy technologies, coupled with the perceived risks of their use, often make it difficult for project developers to attract financing. This situation often presents itself in the preparatory phases of the potential project (i.e., pre-feasibility and feasibility studies), but may also include project financing for well-designed, commercially viable projects. Thus, it is critical to make funds available for investment in sound renewable-energy project opportunities: such funds would be targeted at catalyzing additional resources and serving as seed capital for viable ventures. In this regard the Government of Saint Lucia proposes to take the lead in the creation of a dedicated renewable energy fund. This fund would be aimed at providing concessionary financing for renewable energy project feasibility studies and for project investment. The Government of Saint Lucia will seek funds from several institutions, including the CREDP, the World Bank's Prototype Carbon Fund, and international investors and donors to catalyze this financing.

g. Promotion of Solar Energy

St. Lucia's abundant solar energy resources offer tremendous potential for various applications particularly solar water-heating. The country already enjoys a relatively high usage of solar water heaters spurred by technological improvements, the commercial availability of the systems and the removal of import duties and consumption taxes. An additional impetus to utilization has been the decision by the Government of St Lucia in April 2001 to allow the cost of solar water heaters to be charged against taxable income. This measure is expected to further promote their use. Given the relatively high cost of electricity in Saint Lucia there are clear possibilities for enhancing the use of solar water heaters in the tourism, residential and commercial sectors: a development that would facilitate reductions in foreign exchange leakage, slow the growth of electrical energy demand and contribute to the goal of reducing growth in GHG emissions

Similarly solar Photovoltaic (PV) systems would appear to offer advantages for a diverse set of applications. With the price of the technology falling and improvements in efficiencies and end-uses the Government of St Lucia views the increased use of PV technologies as a cost-effective alternative in several areas. The use of PV technology in demonstration applications such as government buildings and institutions is seen as an opportunity to introduce the nation to the demands and the potential of these units. In other instances, such as hurricane shelters, PV offers an immediate benefit as a reliable back-up power source. If applied to hurricane shelters, many of which are located in schools or other public buildings, then the systems will offer the opportunity to introduce these systems to school children via educational programs.

h. Establishment of Guidelines for Energy Efficient Practices in Government Buildings

The Government of St Lucia intends to take an active role as a catalyst for sustainable energy use through the establishment of standards for energy efficient practices in government buildings. This is seen as having at least two principal benefits. Firstly, given the considerable number of government offices and institutions, reducing energy conservation in this sector can contribute to an overall national reduction in energy use. Secondly, the Government will serve as an example to other sectors in the economy by adopting energy efficiency practices. It is intended to implement a variety of energy efficiency practices, including the use of energy efficient lighting and other appliances, training and implementation of energy conservation practices, and improvements in the design of new buildings so as to make them more energy efficient. Specifically it is intended to conduct an assessment of the potential for energy efficiency practices in all Government buildings. Based on this assessment, efforts will be initiated to develop standard manuals for use by government agencies describing recommended and/or required practices for existing and new buildings and equipment

i. Improved Efficiencies in the Transport Sector

As noted earlier a significant and growing proportion of the GHG emissions produced in St Lucia is generated by the transportation sector, in addition to having other adverse economic and environmental impacts. At present the vehicle fleet operates exclusively on imported gasoline and diesel fuels. Identifying alternatives to these vehicles could significantly reduce transportation related environmental impacts as well as restricting increases in GHG emissions. Against this background the Government of St Lucia intends to initiate efforts to put in place a demonstration fleet of alternative-fueled vehicles. Vehicles operating on alternative fuels are increasingly becoming commercially available particularly electric-powered vehicles and electric/gasoline hybrids. In view of the size of the island St Lucia offers an ideal location for demonstration of such vehicles, since one of the limiting factors of such vehicles has traditionally been their range. Other alternatives such as compressed natural gas (CNG) or biofuels would also appear to offer attractive long-term solutions, but will generally require more substantial and costly infrastructure.

As part of its initiative to transform the country's energy sector the Government of St Lucia is desirous of cooperating with international private and public sector agencies in investigating sustainable options for a demonstration fleet of alternative fueled vehicles.

It is also intended to establish regulations promoting the increased use of higher efficiency vehicles including for public transportation. This is consistent with the Governments aim of promoting greater use of low cost public transport, an objective recently pursued through reductions in import duties on approved public service vehicles. Government also intends to set standards for exhaust emissions for all vehicles, including those used for public transportation, in an effort to improve air quality while at the same time reduce emissions of polluting GHG's.

j. Development of a Portfolio of Sustainable Energy Projects

Implicit to all the initiatives for the promotion of sustainable energy development in St Lucia is the need for preparation of a detailed integrated national Portfolio of Sustainable Energy Projects. This will guide sectoral level action and provide a policy blueprint for advancing the objectives of the Sustainable Energy Plan. Among the objectives of the Portfolio will be to provide prospective investors with a clear framework for identifying areas for investment, allow for the integration of ongoing regional and international projects such as the Caribbean Renewable Energy Development Project (CREDP), and clearly establish institutional roles and responsibilities.

Given present national capacity constraints opportunities exist for support from appropriate regional and international agencies to contribute towards the development and financing of the Portfolio.

3.4 SUSTAINABLE FORESTRY MANAGEMENT

St. Lucia's forests act as a reserve for the storage of carbon in live and dead vegetation and in forest soils. After discounting CO_2 emissions due to forest and grassland conversion (68.06 Gg) and carbon release from forest soils (95.89 Gg), 1994 net CO_2 removal by regrowing forests that were anthropogenically impacted amounted to 352 Gg, . In addition over 10 % of St. Lucia's non-CO_2 emissions originate from the land use and forestry sector. Mitigation of net GHG emissions from forests and forest soils in St. Lucia should therefore be focused on methods aimed at reducing emissions and enhancing carbon uptake while also contributing towards wider socio-economic and environmental protection goals and objectives.

St Lucia's forestry resources constitutes a rich resource of terrestrial biodiversity that in addition to its important roles as a watershed, habitat for a variety of forms of flora and fauna, and as an eco-tourism resource, is also a sink for GHGs. Notwithstanding fairly extensive socio-economic pressures towards deforestation the Government of St Lucia has embarked on a number of measures aimed at the sustainable use and protection of this invaluable resource.

As a part of its commitments under the United Nations Convention on Biological Diversity (CBD) the Government of St Lucia has prepared a national Biodiversity Strategy and Action Plan (NBSAP) one of the goals of which is to provide an overall framework for the protection of forestry ecosystems in terrestrial and coastal environments. The NBSAP has been developed following an intensive period of consultations with stakeholders at community, sectoral and national levels as well as involving inputs from various regional and international agencies active in St Lucia. Generally the NBSAP can be seen as providing an opportunity for enhancing management of the island's forestry resources through such measures as strengthened forestry legislation, community participation in forest management, *in situ* and *ex situ* conservation and public awareness. The Government of St Lucia has already officially adopted the NBSAP, paving the way for attracting local and foreign technical and financial resources towards projects aimed at achieving the CBD's goal of an ecosystem approach to management of the islands forestry resources.

The adoption of the NBSAP follows a number of other policies and measures to achieve improved management of the forestry sector. These center around institutional strengthening of the Forestry Department of the Ministry of Agriculture which, since the early 1980's, has been actively involved in a number of efforts to protect the islands forests through various cooperation activities with local, regional and international partner agencies. These activities have included the mapping and delimitation of forest reserves, greater enforcement of existing forest legislation and regulations, and an extensive public awareness programme targeted at a range of stakeholders. One of the most innovative and successful thrusts has been directed towards increasing community participation in the management and sustainable use of forest resources most notably through eco-tourism activities that actively involve local communities in maintaining and utilizing the forests for nature tourism related activities in an environmentally sustainable and economically productive manner.

The overall outcome of these various policies and measures has been to reduce the levels of deforestation throughout the islands protected forests although pressures still exist for non-sustainable exploitation of these resources most notably for agricultural and residential development.

3.5 AGRICULTURE

The UNFCCC requires that the international community make efforts to stabilize GHG emissions at sustainable levels. This presents challenges for St Lucia's small but crucial agricultural sector, which must support an expanding population, while adapting to expected adverse anthropogenic impacts on the sector, and while also taking efforts to minimize its share of the contribution to global GHG emissions.

Currently, CO_2 emissions in the agriculture sector are largely due to the use of machinery for cultivation practices such as tillage, harvest and irrigation water application. Among the options that St. Lucia may use to reduce CO_2 emissions in the short to medium term are: *altering tillage practices* so as to reduce N_2O emissions from soils; using *alternative energy* sources where feasible, such as the use of solar energy for drying of crops, to limit CO_2 emissions; and by improving efficiency of energy use in the agriculture sector.

In the longer term, CO_2 emissions from agriculture in St. Lucia may also be reduced through the *substitution of fossil fuels by less carbon-intensive bio-fuels* such as ethanol. Similarly, longer term CO_2 mitigation in agriculture can be achieved by *creating and strengthening carbon sinks* and through implementation of measures to promote *carbon storage in managed soils*.

CH_4 emissions in the agriculture sector of St. Lucia in 1994 are mainly attributable to enteric fermentation of animals and manure management and to limited rice cultivation. Technologies that may be used to mitigate CH_4 emissions from agriculture in St. Lucia include shifts in cultivation techniques (such as the use of mineral as opposed to organic fertilizers), and the development and use of hybrids.

Significantly, it is recognized that while initiatives in agriculture can contribute to the goals of the UNFCCC, these can only do so in a partial way, particularly for small, vulnerable countries like St Lucia. Estimates of future global emissions of GHG from agriculture pale in comparison to those projected from energy use, and efforts to address reductions or enhance sinks in the agriculture sector, should be fully complimentary to wider goals for sustainable agricultural development. In St Lucia's case this means that GHG mitigation initiatives in the agricultural sector should be supportive of attempts to promote agricultural self-sufficiency, contribute to export earnings, reduce food imports, and improve nutritional levels. Importantly, Non-annex 1 countries like St Lucia, need to ensure that these measures are economically viable, and do not impose adverse non-sustainable long term financial and environmental costs.

Opportunities exist for regional and international cooperation to advance technology transfer, as well as financial and technical support that will be necessary for enabling St. Lucia and other non-annex 1 parties to the UNFCCC, to adopt pathways to sustainable agricultural development that also fully incorporate GHG mitigation measures.

3.6 IMPROVED WASTE MANAGEMENT

In St Lucia the main GHG emissions from the waste sector emanate from CH_4 emissions from solid waste disposal, industrial, commercial and domestic wastewater treatment, as well as from N_2O emissions from human sewage. For 1994, the most important GHG in this sector was CH_4 (1.20 Gg) from solid waste disposal sites that accounted for over 97 % of St. Lucia's emissions of this gas. N_2O emissions (0.05 Gg) from human sewage were small, although amounting to over 25 % of St. Lucia's emissions.

Traditionally effective solid and liquid waste management in St Lucia has been confronted by a number of barriers including lack of a sanitary landfill disposal site, ever growing volumes of waste, and inadequate public awareness of the health and environmental risks associated with improper disposal.

Since the mid 1990's St Lucia along with a number of other eastern Caribbean States has participated in a World Bank/Global Environment Facility funded project aimed at enhancing the country's solid waste management capabilities. Arising from this project, modern and efficient solid waste collection and disposal systems have been instituted. The two existing waste disposal sites have been upgraded from open dumps to engineered landfills and construction of a modern sanitary landfill for the north of the island has begun in the Deglos Valley while a site is currently being sought for the construction of a sanitary landfill to serve the south of the island. In addition to the provision of hardware and engineering solutions the project also provides resources for public awareness and institutional strengthening

The country has also since the mid 1990'succesfully introduced measures to upgrade liquid waste collection particularly in the heavily populated north of the island. The net effect has been to reduce the problems of coastal pollution traditionally associated with improper liquid waste disposal. This will also contribute towards wider global commitments to reduce levels of GHGs arising from the waste sector.

3.7 CONCLUSION

As a Non-Annex 1 Party to the UNFCCC, St Lucia has committed itself to the ultimate objective of the treaty as defined in Article 2 which calls for the stabilization of GHG emissions at levels that would not result in dangerous anthropogenic interference with the global climate system. At the same time as a developing country confronting the challenges of poverty eradication, socio-economic progress, and environmental sustainability the country's development agenda is necessarily also focused on measures aimed at pursuing sustainable human development.

In this regard, climate change mitigation efforts in St Lucia will need to revolve around a series of inter-related initiatives that encompass capacity building, technology transfer, and technical support for sustainable energy development and management. The role of the international community will be particularly instrumental in providing the technical and financial resources necessary for a successful transition to a sustainable energy future. This will complement the substantial efforts already being taken by St Lucia to promote sustainable energy solutions, improve agricultural productivity, advance forestry protection, and minimize coastal and marine resource degradation resulting from non-sustainable waste management activities.

Particular opportunities for international and regional cooperation and support already exist and there is the now the need for implementation of the various mechanisms and modalities envisaged under the UNFCCC and the Kyoto Protocol – special recognition of the needs of Non Annex 1 countries (Articles 4.8 and 4.9), transfer of technology, Clean Development Mechanism, Joint Implementation etc – that will be necessary for translating into even more meaningful measures, the important initial actions already being taken by the Government and people of St Lucia.

VULNERABILITY & ADAPTATION ASSESSMENT

4.1 INTRODUCTION

St. Lucia experiences the effects of climate variability as manifested in flooding and drought conditions, as well as extreme weather events in the form of hurricanes and other tropical cyclonic activities. While St Lucia has not had any direct hits from hurricanes since Hurricane Allen in 1980, the country experienced Tropical Storm Debbie in 1994, with some stations recording 300 mm of rainfall in a 24-hour period. Hurricane Lenny, in 1999, also had significant impacts, primarily in the coastal environment, even though the storm remained hundreds of miles away from St Lucia. The question of whether recent enhanced storm activity can be attributed to anthropogenic climate change, or considered part of natural cycles of storm and climate variability, remains inconclusive. This is however expected to be one of the impacts of climate change in the Caribbean under IPCC projections (IPCC, 1995).

Climate change studies generally base their analysis on records with a baseline of thirty years, often using the period 1960 – 1990 as the baseline. The time period covered by existing meteorological data for St. Lucia therefore does not provide sufficient data for arriving at any definitive trends in terms of changes in climate or weather patterns.

The situation with respect to sea-level rise also indicates that many areas of the insular Caribbean have experienced coastal erosion at levels above the global average. Regionally, relative sea levels have been recorded as rising at an average of 3mm per year but with considerable variability (Hendry, in Maul 1993). The causes of such variability remain an area for further assessment [1].

4.2 CLIMATE CHANGE SCENARIOS FOR ST. LUCIA

In order to assess the impacts of climate change, it is necessary to obtain a quantitative and/or qualitative representation of what the changes in climate are likely to be. Given the complexities of the global climate system, no methods yet exist for providing watertight predictions of climate change. Instead, it is normal to utilize a number of climate scenarios selected to provide climatic projections that are plausible and which can form a scientific, comparable and transparent basis for projecting the likely impacts of changes in the Earth's climate.

For the temperature and rainfall climate parameters, three scenarios are utilized – high, medium and low. The low scenarios are estimates based on projections for GHG emissions and include the cooling influence of aerosols on the atmosphere. The medium case scenarios represent projections for global climate change without the influence of aerosols. The high case scenarios provide synthetic estimates.

The third and fourth scenarios are seasonal estimates for temperature and rainfall for 2050. In these cases only high and low forecasts are used.

For the sea-level rise parameter, three scenarios are used. These are for low, medium and high GHG emissions growth rates to 2050 and are based on estimates from the Hadley Center in the United Kingdom. In the case of the tropical storm/hurricane parameter, simple synthetic estimates for increased frequency and intensity of these events are used as tools for sensitivity analysis.

The following six scenarios for climate change are used in the assessment:

Table 4.1 Six Climate Change Scenarios used in the National Climate Change Vulnerability and Adaptation Assessment

Factor	Period	Scenario	Change
Annual Mean Temperature Change (oC) for 2050	Average	Low Medium High	+1.71 +2.03 +5.0
Annual Mean Precipitation Change (%) for 2050	Average	Low Medium High	-1.3 -5.2 +20
Seasonal Mean Temperature Change (oC) for 2050	December-February	Low High	1.68 2.00
	June-August	Low High	1.71 2.01
Seasonal Mean Precipitation Change (%) for 2050	December-February	Low High	3.4 5.9
	June-August	Low High	-14.4 -6.9
Projections for Sea Level Rise (cm) for 2050	Average	High Emissions Medium Emissions Low Emissions	50 39 26
Tropical Storms /Hurricanes Scenario	Average	High Low	+20 -20

The foregoing scenarios serve as useful tools for assessing the extent of the country's vulnerability to even moderate degrees of changes in climate. This is particularly important since the St Lucia economy, and by extension, its socio-political structures, are largely natural resource- dependent, and therefore, directly affected by alterations in climate parameters. There is in fact a growing body of concern that the projected impacts of global climate change are already being felt rather than being future conditions. If this is actually the case, then it is important that St. Lucia begin the process of impact assessment and development of adaptation options since ongoing and projected development programmes, plans and projects are likely to be affected by changes in the external environment as driven by changes in weather and climate patterns.

4.3 THE COASTAL ZONE AND FISHERIES SECTOR

4.3.1 THE COASTAL ZONE

Broadly defined, the coastal zone of the island covers both the marine and terrestrial components of the coast such as habitable land. It "…includes extensive areas of complex and specialized ecosystems such as mangroves, coral reefs and sea grass beds, which are highly sensitive to human intervention" (IPCC 1994).

Like many other Small Island Developing States (SIDS), the coastal zone of St. Lucia is characterized by a rich diversity of ecosystems that have become interwoven into the fabric of the socio-economic existence of its population. In addition to providing a livelihood, the coastal zone has been the focal point for settlement, transport and communication and has been actively modified over time to reflect the population's changing customs, traditions and socio-economic aspirations.

In the context of climate change, the main environmental components of the coastal zone, which are likely to be under threat from climate change impacts in St. Lucia are beaches, coral reefs, mangals and the diverse species which occupy these coastal habitats. The degree of climate change impacts on the coastal zone will however be determined by the existing condition of the resource base and by the degree of stress to which it has already being subjected. These stresses include both the major non-human causes of stress such as storm surges associated with tropical cyclones and also the human induced stresses such as the pollution of rivers and the fouling of coastal areas that result in the degradation of the coastal resources. These actions produce adverse impacts on the ecosystems on which the human populations depend and seriously reduce the ability of these ecosystems to adapt to the effects of climate change.

4.3.2 CRITICAL HABITATS OF THE COASTAL ZONE

Beaches are important to St. Lucia for several reasons. They serve as: recreational areas for both locals and visitors, buffer zones protecting the coastal land and infrastructure from wave action; they provide sources of fine aggregate for construction; fish landing sites and habitats for some types of terrestrial and marine life. They are also an important component of the tourism package. The island's beaches are however being degraded through activities such as excessive sand mining and through development on beaches and nearshore areas.

Mangals provide important fishery and avifauna habitats but this fact has not discouraged deforestation for developmental purposes. Such destruction has been due largely to the fact that many of these systems are located on lands under private ownership and to the fact that there is a general absence of legal demarcation of Marine Reserves islandwide.

Coral reefs play a vital role in coastal stability and serve as fish breeding and nursery grounds, avifauna habitat, silt traps and nutrient exporters. However, coral reefs and sea grass beds (and subsequently nearshore fisheries) also face threats from nutrient loading and other types of chemical pollution resulting from land and water based activities, such as agriculture and fishing and tourism related activities including diving and snorkeling.

4.3.3 THE FISHERIES SECTOR

In 1999, there were approximately two thousand (2000) fishermen, two-thirds of whom were employed on a full-time basis in the industry. The main fish processing facility is the St. Lucia Fish Marketing Corporation based in Castries. There are also three (3) other recently established operations, all privately owned and operating in the north of the island. Most fish landing sites are located on the west coast of the island. In recent times, there has been significant investment in the construction of landing sites that are equipped with concrete landing docks, vending stalls, cold storage facilities, fishermen's storage cubicles and public bathrooms. Over the last ten years, approximately US$16 million has been invested in the construction of such facilities. Investments have also been made in training fishermen in new and more efficient methods of fishing.

In recent years there has been a steady increase in fish production. This has been attributed to a number of factors including:

- An increase in the number of fishers in the industry;
- An increase in the number of fish craft;
- Larger fishing vessels;
- More efficient fishing gear and methods.

4.3.4 FISHERIES RESOURCES OF ST. LUCIA

The coastal waters provide a habitat for many different types of fish. Shallow shelf and reef fish are found concentrated on fringing and patch reef systems as well as within seagrass beds and mangroves. Deep slope and bank fish are found on the island's shelf, along its slopes and/or deep banks located in the north-west, north-east and southern sections of the island. Coastal pelagics are captured primarily in the calm waters of the island's west coast. Large pelagics contribute almost 70% of total fish landings and thus represent a significant component of the island's fishery resources. The coastal waters are home to variety of crustaceans including lobsters. Exploitation of mollusks focuses mainly on the harvesting of conch (*Strombus gigas*).

Some of the critical habitats (such as the coral reefs and the mangals) of the coastal zone described above are important fisheries ecosystems. Other important fisheries ecosystems are the seabed and the open ocean. Due to a number of reasons including over-fishing, habitat degradation, environmental stress impacting on age of maturity, spawning frequency and success, fry production and survival, resistance to disease and other possible biological conditions, some fish species have been identified as being under threat of population collapse.

4.3.5 POTENTIAL IMPACTS ON THE COASTAL ZONE AND THE FISHERIES SECTOR

Tables 4-2 to 4-4 below summarize the potential impacts of climate change on the critical habitats of the coastal zone, on the fisheries sector and outline some of the implications of these impacts for St. Lucia.

Table 4.2 Anticipated Impacts on Beaches

Impacts	Implications	Area/Location of Greatest Impact
Tropical cyclonic activity will play a major role in continued beach destruction as St. Lucia lies in the hurricane belt. • Beach erosion, beach loss and loss of coastal vegetation due to erosion and inundation resulting from sea level rise and tropical cyclonic activity.·	Loss of recreational beaches for visitor and local use. Reduced aesthetic appeal of beaches. Reduction in the quality of a major tourism product. Shoreline exposed and unprotected and increasingly vulnerable to subsequent storm events. Reduction or removal of the buffer zone protecting coastal land and infrastructure from wave action. Damage to coastal infrastructure. Disincentive to investment in tourism and other types of coastal development. Loss of sources of fine aggregate for construction. Destruction of critical fish landing sites and habitats for some types of terrestrial and marine life. Loss of income and the livelihood of small fishermen. Damage to or loss of coastal properties including housing stock. Increasing stress on hillside locations to accommodate relocation e.g. of coastal residents.	The west coast, particularly the northwestern section where the original landscape has undergone rapid change as a result of tourism development, recreational activities and other activities such as sand mining.
• Beach accretion.	Enhancement of existing beaches or the creation of new beach areas.	

Table 4.3 Anticipated Impacts on the Coral Reefs

Impacts	Implications	Area/Locationof Greatest Impact
Coral reefs are very sensitive to changes in Temperature and light intensity.· Increased mortality due to temperature increase that will result from coral bleaching and/or impaired reproductive functioning of the coral.· Die of reef species due to reduction in light intensity· Reef over topping due to sea level rise.· Increased mechanical destruction of coral reefs due to tropical cyclonic activity.· Coral reef damage from sedimentation due to increased precipitation and its associated effects.	Reduction in the extent of coastal reefs and increased mortality among existing species. Destruction of the habitats of some marine species. Threat to the survival of eco-tourism sector and near shore fisheries. Loss of income and the livelihood of small fishermen. Loss of natural coastal stabilizer that will result in greater threat to coastal infrastructure and coastal property. Coastal land loss as a result of greater exposure of the shoreline to wave action and thus greater threat to coastal settlements. Increased exposure of vegetation to salination and wind borne salt.	North West Coast Reefs along the northwestern coast face threat from nutrient loading and chemical pollution resulting from land and water based activities. While all coral reefs will be affected by climate change, the reefs located along the northwestern coast will suffer the greatest impact.

Table 4.4: Anticipated Impacts on the Mangals

Impacts	Implications	Area/Locationof Greatest Impact
Tropical storm activity and sea level rise are perhaps the main aspects of climate change to be considered. • Inundation of mangrove forest due to sea level rise. • Increased mechanical stress on mangrove stands during the extreme events of tropical storm activity.· • Increased instability of the island's coasts through shoreline erosion due to tropical cyclonic activity.	• Reduced acreage of mangrove stands/forest and increase mortality among species. • Threat to the survival of the eco-tourism sector and near shore fisheries. • Loss of income and the livelihood of small fishermen.· • Loss of natural coastal stabilizer, which will result in greater threat to coastal infrastructure and property. • Coastal land loss as a result of greater exposure of the shoreline to wave action and thus greater threat to coastal settlements. • Increased exposure of vegetation to salination and wind borne salt.	The west coast Compared to the east coast, very few mangroves are found on the west coast.

4.4 FORESTRY AND TERRESTRIAL RESOURCES

4.4.1FOREST RESOURCES

St. Lucia covers a total area of 61,500 hectares of which forest covers 23,157 hectares (16,621 rainforest, 7,515 dry scrub forest, 2,666 in grass and open woodland). The Forest Reserve consists of 7,500 hectares of which 6,607 hectares compose the natural forest and 263 hectares are under plantation. 1560 hectares of Crown Lands are under natural habitats. There is a 4,500-hectare parrot sanctuary (95% of which is within the Government Forest Reserve). Forested private lands (14,170 hectares) represent 10% of total private land.

Natural vegetation types consist of rainforest dominated by Gommier (*Dacryodes excelsa*) and *Sloanea caribea),* lower montane forest, elfin woodland or cloud forest, xerophytic forest and dry scrub woodland. There are 37 main watersheds corresponding to 37 main watercourses, each of the former being at various states of utilization and degradation.

4.4.2 FOREST UTILIZATION

Most of the timber felled on the island occurs on private lands and is used for construction and charcoal production. Non-timber forest products include Latanier (*Cocothrinax barbadensis*) for broom production, L'encens (*Protium attenuatum*) for incense production and bamboo (*Bambusa vulgaris*) in the construction industry. A variety of trees are produced to meet a range of needs such as windbreaks, agroforestry production, fencing and riverbank protection. The interest in the islands natural forest resources has grown to include ecotourism activities as tourists visit the island's natural areas. Forest tours have increased with the opening of new trails, generating the largest share of revenue for the Forestry Department.

4.4.3 SOCIO-ECONOMIC ISSUES

It is recognized that climate change impact will not occur in isolation but rather its effects will be influenced by other existing environmental conditions. Traditional sectors (e.g. agriculture, and manufacturing) have already imposed severe environmental strains on natural ecosystems. Conservation problems are heightened by the difficulty of differentiating climate change impacts from other stress related environmental stresses such as habitat decline, forest fragmentation, introduction of alien species and loss in community diversity. St. Lucia has also suffered from the lack of an appropriate land use policy. Problems such as lack of proof of ownership; the absence of an integrated system of planning, inadequate legislation to control land development and an inadequate capacity to monitor development and limited ability to ensure compliance. Watershed protection and management was the leading concern in the establishment of Forest Reserves, while, tropical dry forest was perceived to be of relatively minor importance and is currently undergoing rapid deforestation.

4.4.4 CLIMATE CHANGE IMPACTS

The range of natural life zones occurring in St. Lucia displays a heterogeneity and rich diversity typical of the tropics. Under the climate change scenarios, particularly projections of reduced rainfall and increased temperatures, such diversity is expected to be lost as homogeneity in habitats increases. This may be expected as areas of current microclimatic conditions are lost and large-scale ecosystem shifts occur. Given the projections of reduced rainfall and increasing temperatures, drought could become a more ominous feature in the future, particularly as the very dry forest to dry forest life zone expands.

Figure 4.1 Climate Change Impact Life Zones in Saint Lucia

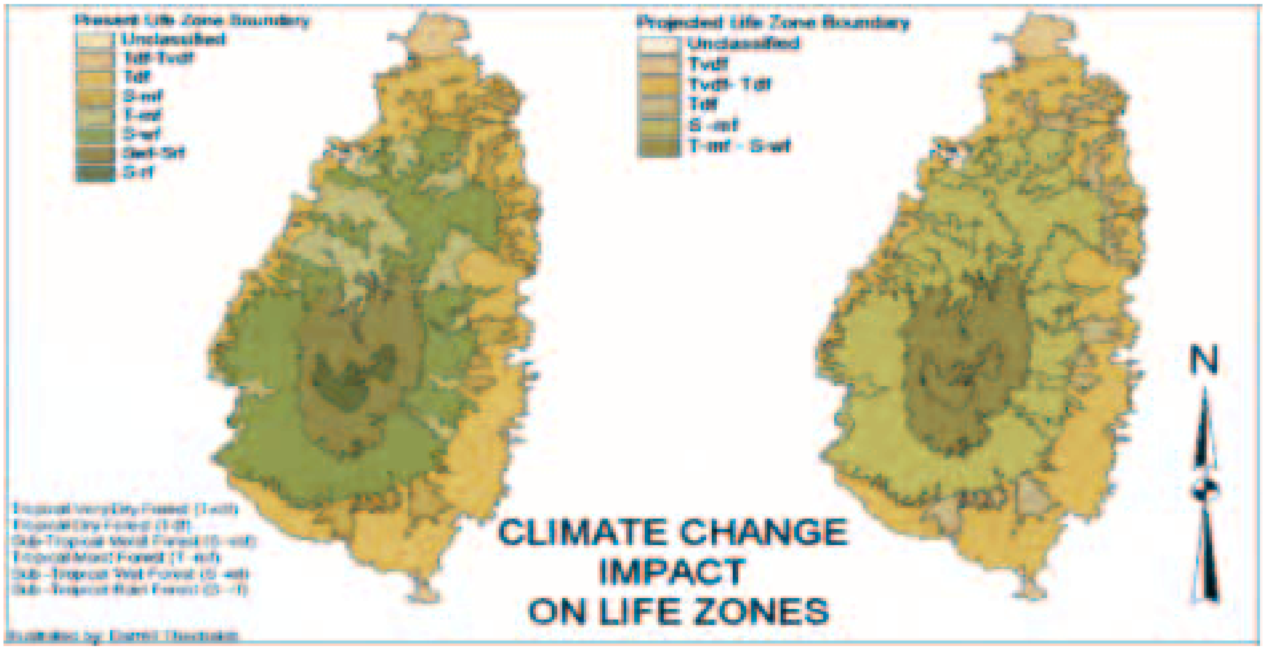


Table 4.6 Anticipated Impacts on Forestry and Terrestrial Resources

IMPACTS	IMPLICATIONS
Climate Change Factor: **Precipitation**	
• Rapid decline of forest due to extremes of water availability (i.e. flooding or drought). • Substantial increase in the tropical dry forest zones associated with the loss of subtropical rainforest zones, due to decreased rainfall combined with increased temperature. (See maps above) • Destruction of habitats or alteration in the geographical extent of the habitats of flora and fauna. Alterations in species population size, distribution and composition.	Potential loss of rainforest and its biodiversity, particularly endemic species, will represent loss of income and employment for individuals and communities, which depend on tourism and consequently losses of revenue to the eco-tourism sector, the tourism industry and the economy in general. Loss of forest cover and therefore the natural protection against soil erosion Degradation of watersheds and hence reduction in water supply and quality. *Transportation and deposition of debris into villages and towns leading to the blocking of drainage systems
Climate Change Factor: **Temperature**	
• The increased vulnerability of vegetation and wildlife due to the increased incidence of pest and pathogens. • Increased frequency and intensity of forest fires	Same as above except*.

Table 4.6 Anticipated Impacts on Forestry and Terrestrial Resources (Cont'd)

IMPACTS	IMPLICATIONS
Climate Change Factor: **Tropical Cyclonic Activity**	
• Damage to vegetation by strong winds, which will result in loss of fauna and habitat • Damage to tourism infrastructure in rain forest • Damage to watershed areas due to loss of vegetation cover.	Significant reductions in the revenue generated by the eco tourism sector Some loss of forest cover and therefore the natural protection against soil erosion Degradation of watersheds, damage to water intakes and hence reduction in water supply and quality. Potential loss of forest biodiversity
Climate Change Factor: **Sea Level Rise**	
• No direct threats anticipated for inland forest • Loss of coastal forests due to inundation and increasing storm events • Migration or loss of wildlife species from altered habitats	Indirect threats from increased pressure on inland forest reserves to provide land for settlement, agriculture and other forms of development when coastal land is lost to erosion and inundation. Potential loss of forest biodiversity.

4.4.5 SPECIFIC IMPACTS ON WILDLIFE HABITATS/ECOSYSTEMS

St. Lucia is home to several endemic species, many of which are habitat specialists. The degree of specialization can create problems for species that cannot adapt to changes provoked by climate change. In coming decades, as pressure on the remaining habitats increases and they decline due to fragmentation, the impacts of climate change is expected to exacerbate the situation. The possible impacts of climate change on forests and terrestrial ecosystems can be summarized as follows:

The faster the rate of climatic change, the higher the probability of substantial disruption of ecosystem structure and function.

Ecosystems will not react uniformly in response to climate change. Existing species associations will break up and new communities of plants and animals will take their place.

Ecosystem response to climate change will depend largely on competition between species. In many cases, species such as pests, parasites, and opportunists will benefit.

Ecosystems already stressed by human activities will be more vulnerable to climatic threats; however, the multiple factors affecting these ecosystems will complicate the identification of strictly climatic effects.

Species' adaptive abilities depend not only on genetic variability but also on dispersal and migration capacity. Ecosystem resilience and genetic variability being reduced through habitat fragmentation will be aggravated by climate change.

4.5 FRESHWATER RESOURCES

Access to safe and adequate supplies of freshwater is a most basic human need and is a *sine qua non* for sustainable national development. St. Lucia is a volcanic island, and geologically is composed of impermeable rock which does not readily permit the movement of water into underground reserves. Water reserves therefore occur as surface run-off and are located in rivers, wetlands, streams and springs.

There are thirty- seven (37) main sources of surface run-off and few groundwater sources. Where the latter do occur, they are used primarily for irrigation. Surface water catchments are relatively small, with steep slopes on which run-off occurs fairly quickly, and are decreasing in volume due to over-exploitation and chemical contamination. They are heavily exploited for municipal and agricultural purposes.

Freshwater supplies are highly susceptible to normal climate variability such as natural disasters. During the dry season, water levels fall drastically, while in periods of heavy rainfall, rivers quickly overflow their banks. Watercourses are also prone to siltation during heavy rainfall. Human activities currently affecting water quality in St. Lucia's rivers and freshwater systems include those arising from: housing, agriculture, Water abstraction, sewage disposal, solid waste disposal, tourism, fishing, river sand mining, manufacturing, river bathing and picnicking, and river alteration.

Table 4.7 Anticipated Impacts on the Fresh Water Resources

IMPACTS	IMPLICATIONS
Climate Change Factor: **Sea Level Rise**	
• Sea level rise may precipitate the intrusion of salt water into fresh water lenses, particularly in low-lying coastal areas.	While there is little use of ground water in St. Lucia, saline intrusions will reduce the quantity and quality of potential source of potable water. Irrigation with brackish water will most often destroy crops and ruin soils.
Climate Change Factor: **Tropical Storm Activity**	
• Destruction and/or modification of existing aquatic ecosystems caused by the increased frequency and intensity of precipitation. • Soil erosion resulting from increased surface run off on exposed soils. • Siltation of river systems during periods of increased rainfall.	Temporary increase in water supply. Damage to water intakes, dams and reservoirs leaving settlements without water or providing poor water quality. Increased social and economic cost to ensure that these facilities are maintained. Degradation of the habitats of species of flora and fauna which occupy the aquatic ecosystems, leading to a loss of biodiversity.

Table 4.7 Anticipated Impacts on the Fresh Water Resources (Cont'd)

IMPACTS	IMPLICATIONS
Climate Change Factor: **Precipitation**	
Decreased precipitation: • Periods of low precipitation are likely to be accompanied by extended dry periods.	Extended periods of drought leading to decreases in water supply for domestic and other use. Consumers who normally maximize rainwater stores may need to increase consumption of treated water to meet domestic needs. The elevation of water rates to discourage wastage and greater efficiency of production may be another necessary option.
Increased frequency & Intensity of precipitation: • Destruction and/or modification of existing aquatic ecosystems. • Siltation of river systems. • Increased incidence of flooding. • The likelihood of cross contamination from leaching of pit latrines into flood plains increases during flooding.	Temporary increase in water supply. Damage to water intakes, dams and reservoirs and/or pollution of water sources leaving settlements without water or providing poor water quality. Increased social and economic cost to ensure that these facilities are maintained. Degradation of the habitats of species of flora and fauna, which occupy the aquatic ecosystems leading to a loss of biodiversity. Loss of livestock and crops Increased freshwater outflows will reduce the salinity of coastal waters with consequences for fisheries, as coral reefs and sea grass beds no longer support their normal biodiversity.
Climate Change Factor: **Temperature**	
• Possibility of excessive evapo-transpiration associated with the level of temperature increases of the high precipitation scenario. • Municipal demands are likely to increase as higher temperatures lead to increased water consumption.	Loss of soil moisture, which will impact on crop production. Dwindling basal flows may alter the biophysical parameters of rivers and wetlands sufficiently to affect breeding cycles, offspring and parent fecundity, offspring survival and overall species resistance to environmental stresses such as disease and fishing effort.

4.6 HUMAN SETTLEMENTS, HUMAN HEALTH AND SERVICES

4.6.1 HUMAN SETTLEMENTS

All major settlements in St. Lucia are located along the coast and typically in valleys at the mouth of rivers, which make these settlements particularly vulnerable to flooding. Approximately fifty percent (50%) of the entire population resides within the Castries/Gros-Islet corridor located along the north-western coast of the island. Much of the capital, Castries, is built on low-lying reclaimed land making the city centre prone to flooding during periods of heavy rain. Touristic, commercial, industrial, and most agricultural development is also concentrated in the coastal belt.

In St Lucia, the basic settlement pattern has emerged largely as a product of the island's small size and physiography (i.e. mountainous interior and low lying coastal lands). The development of coastal areas historically represented the most feasible option for occupation by the human population. As economic activity required, inter alia, easy access to shipping ports.

St. Lucia's coastal areas are vulnerable to threats from tropical cyclonic activity and possible sea level rise resulting from tectonic and anthropogenically-induced subsidence and stress. Coupled with these physical constraints are a number of social and economic factors that contribute to the vulnerability equation. These include a high unemployment rate, particularly among the young; the absence of a diversified economic base and the heavy dependence on two main economic sectors (tourism and agriculture), the latter of which is currently experiencing gradual decline. Climate change will exacerbate the existing vulnerabilities, placing additional stress on the ability of individuals, communities and the economy in general, to adequately provide for the welfare, health and security of the population. The future of human habitation therefore depends on the sustainable management of the coast, a challenge which is becoming even more daunting as island populations increase and the associated demands on coastal resource change and increase.

4.6.2 HUMAN HEALTH AND HEALTH SERVICES

Notwithstanding budgetary, human resource and institutional restrictions, St. Lucia benefits from a relatively high standard of health care as measured by the United Nations Human Development Index. Despite this, the Ministry of Health is currently undertaking a process of health sector reform geared towards strengthening the country's ability to respond to the changing health care needs of the population. This initiative is aimed at identifying innovative and sustainable responses to meet current and future demands for health care services in St. Lucia. Areas of health care under this initiative include: community-based health care, the improvement of existing district health teams; health sector financing; the development and efficient distribution of health care information; human resource development and the establishment of a National Health Service Plan.

The primary goal of the health care system in St Lucia is to provide care at the primary, secondary and tertiary levels. This covers health care providers in both the public and private sectors. A key element of the overall health care service is the surveillance system for communicable diseases which has assisted in successfully reducing morbidity and mortality resulting from such diseases. This success has been achieved through a nationwide immunization programme targeted at diseases such as polio, tuberculosis, tetanus and measles. These programmes are ongoing measures that are in keeping with national, regional and international efforts.

In St. Lucia, influenza and acute respiratory infections constitute two of the main sources of morbidity particularly among vulnerable population groups such as the elderly, infants and the undernourished. However, malaria and dengue are generally regarded as two of the diseases that are likely to be most affected by anthropogenic climate change. Dengue is endemic to the Caribbean and regular outbreaks occur throughout the region, including St.

Lucia. Epidemics are costly in terms of hospitalization costs, patient care, vector control efforts, national economic productivity and human suffering. Diarrhoeal diseases represent one of the most significant reasons for individual health care attention. In 1998 and 1999, incidences of diarrhoeal diseases peaked at the period when drought conditions were believed to have encouraged inadequate sanitary conditions and practices in many communities.

The principal causes of mortality in St. Lucia are associated with the transition from a rural to a service-oriented economy. In 1998 and 1999, the three greatest causes (i.e. broad causes) of mortality were cardiovascular, neoplasm and cerebrovascular diseases. Cardiovascular disease is the single main cause of mortality causing 23.1 % and 19.3% of deaths in 1998 and 1999 respectively. This condition is likely to be exacerbated by increased air temperatures as well as stress associated with the climate extremes such as hurricanes. Respiratory illnesses, though representing only 6.8% and 4.3% of deaths in 1998 and 1999 respectively, are also likely to be affected by changes in climate parameters.

4.6.3 POTENTIAL IMPACTS HUMAN SETTLEMENTS AND HUMAN HEALTH/ SERVICES

In this context, human settlements refer to the entire island system which comprises the human population itself and the components of the system that provide opportunities for a livelihood and recreation. However, since separate treatment is given to those components of the system, the discussion of impacts will focus on those components of the human settlements sector such as health, housing and critical infrastructure which have not been addressed. Tables 7 and 8 which follow summarize the anticipated climate change induced impacts on human health, housing and critical infrastructure, in addition to providing an outline of some of the implications of these impacts.

Table 4.8 Anticipated Impacts on Human Health and Health Services

Impacts	IMPLICATIONS
Climate Change Factor: **Tropical Cyclonic Activity**	
• Altered frequency and/or intensity of extreme events (e.g. storms, hurricanes, landslides and flooding). *	Death, injuries, increased incidence of various infectious diseases, and psychological stress and disorders.
• Damage to public health infrastructure due to the occurrence of extreme events (e.g. storms, hurricanes and flooding).	Increases in vector borne diseases
• Flooding will exacerbate existing threats to the integrity of public health, when e.g. the problem of inappropriate sewage disposal will pose threats to water supplies. *	Cases of influenza likely to be increased by enhanced hurricane and storm activity.
• Socio-economic and demographic dislocation due to loss of property, infrastructure and other man made resources and natural resources. *	Reduction in, or loss of, health services.
*Vulnerable locations/groups: Poorer communities where economic hardship are compounded by difficult topographic and/or geological condition.	Increase in the incidence of water borne and food borne infectious diseases.
	Overcrowding, injuries and psychological disorders. Possible malnutrition due to loss of food resources.
	Increased stress on the public health care systems resulting from all impacts.
	Decline in social and economic development, morbidity and mortality resulting from all impacts.
Climate Change Factor: **Precipitation**	
• Increased flooding in periods of increased precipitation. *	Increase in the incidence of water borne and food borne infectious diseases.
	Increase in the transmission of vector-borne diseases, e.g. dengue, malaria and yellow fever.
	Increase in diarrhoeal diseases as persons are forced to utilize sub-standard water for domestic use.

Table 4.8 Anticipated Impacts on Human Health and Health Services (Cont'd)

Impacts	IMPLICATIONS
Climate Change Factor: **Precipitation (Cont'd)**	
• Water shortages/drought in periods of decrease precipitation. **	Intensification of the prevalence of "water wash" diseases associated with the absence of adequate water for personal hygiene. Increased incidence of asthma and other ailments of the respiratory system due to drought and drier atmospheric conditions. Possible malnutrition due to loss food resource; impairment of child growth and development.
• Altered food productivity due to changes in precipitation patterns, which could affect agricultural productivity	Increased stress on the public health care systems resulting from all impacts.
Vulnerable locations/groups: * Problems are likely to have greatest impact in communities at high elevation and for vulnerable groups such as the elderly, infants and persons suffering from existing medical conditions. ** Lower income rural and urban settlements with inadequate supplies of water and for persons depending on standpipes.	Decline in social and economic development, morbidity and mortality resulting from all impacts.
Climate Change Factor: **Temperature**	
• Disturbed ecological systems due to temperature and humidity increases. • Greater frequency of heat waves due to increased temperature and humidity. * • Increased temperature and the proliferation of microorganisms.*	Increased geographical range of vector borne diseases; changed diarrheal patterns and other infectious diseases; possible malnutrition due to land loss and loss of other food resources Increase in the transmission of vector borne diseases such as dengue, malaria and yellow fever.

Table 4.8 Anticipated Impacts on Human Health and Health Services (Cont'd)

Impacts	IMPLICATIONS
Climate Change Factor: **Temperature(Cont'd)**	
Vulnerable locations/groups: * Low-income groups are most likely to be living in dense settlements e.g. Marchand, Soufriere, La Clery and Anse-la-Raye, where humidity and heat from the urban landscape are likely to be most intense.	Higher incidence of related illnesses predominantly cardio-respiratory diseases.
Urban areas are likely to be worst affected, given the built up nature of the environment. The expanding urban landscape in areas such as Gros-Islet and Vieux-Fort means that increased numbers of persons are likely to be included in these categories.	Increase in the incidence of water borne and food borne infectious diseases.
	Algal blooms associated with biotoxin contamination of fish and shellfish could become more frequent resulting in the proliferation and increased transmission of cholera and in general, seafood contamination and biotoxin poisoning. Greater incidence of respiratory and allergic disorders due to climate enhanced increases in air pollutants. Increased stress on the public health care systems resulting from all impacts. Decline in social and economic development, morbidity and mortality resulting from all impacts.
Climate Change Factor: **Sea Level Rise**	
• Socio-economic and demographic dislocation.	Increased incidence of infectious diseases; overcrowding, injuries and psychological disorders.
• Damage to, or loss of, health infrastructure, loss of property and other man made resources and natural resources.	Possible malnutrition due to loss of land or access to land and loss of other food resources.
Vulnerable locations/groups: Coastal communities.	Increased stress on the public health care systems resulting from all impacts. Decline in social and economic development, morbidity and mortality resulting from all impacts.

4.6.4 ANTICIPATED IMPACTS ON HOUSING AND CRITICAL INFRASTRUCTURE

Current development trends indicate that the island's population is becoming increasingly vulnerable to the impacts of tropical cyclonic activity as over time, there has been a significant increase in the numbers of new residential units and other structures that are being built on hillsides. This has resulted in the creation of high-density residential and other types of developments involving the excavation of steep slopes in some instances and the removal of stabilizing vegetation. It is well known that higher densities incur greater vulnerabilities and impacts in the event of a disaster. Because of their exposed locations, the developments on hillsides and at high elevations are particularly vulnerable to the direct effects of strong winds and landslides usually associated with the passage of hurricanes, storms and other such activity. Climate change impacts on the built environment are also likely to include the destruction of, or damage to, infrastructure and critical facilities in low lying coastal areas as a result of sea level rise and the flooding due to storm run-off and storm surges.

In the past, while there has been no comprehensive assessment of property values exposed to natural hazards in St. Lucia, the experience of past storm/wave activity has been instructive. The value of damage from Tropical Storm Debbie (1994) in Vieux-Fort, Dennery and Anse-la-Raye was EC$230 million; preliminary estimates of the value of damage as a result of the tropical wave of 1996 was EC$12 million, (NEMO 1996). In the aftermath of the two aforementioned weather systems, various combinations of the critical facilities suffered severe damage that required outside (i.e. foreign) support and reconstruction assistance before they were able to resume normal service.

Table 4.9 Impacts and Implications for the Human Settlements Sector

(Housing and Critical Infrastructure)

IMPACTS	IMPLICATIONS
Climate Change Factor: **Tropical Cyclonic Activity**	
• Altered frequency and/or intensity of extreme events - storms, hurricanes, landslides and flooding.	Increased risk of injury and loss of life.
	Increased risk of flooding in low-lying coastal settlements and landslides on hillside and high elevation developments.
• Socio-economic and demographic dislocation resulting from land loss, destruction and/or damage to property, infrastructure and other components of the built environment.	
	Economic cost of relocating affected residents and providing for new and/or additional housing needs.
Vulnerable locations/groups:	
High-density settlements such as Marchand, La Clery, Morne-du-Don, Anse-La-Raye, Dennery, sections of Gros Islet and Soufriere town.	Increasing stress on hillside locations to accommodate relocation e.g. of coastal residents.
Poorer communities, particularly those in coastal locations where economic hardship is accompanied by difficult topographic and/or geological condition.	Overcrowding and psychological disorders arising from social dislocation and relocation given limited land availability for settlements and development.
	"Greater property damage and direct loss of property (e.g. housing and land) particularly among the economically disadvantage. Loss of income and livelihoods resulting from loss of business related or commercial property and the destruction and/or damage to coastal infrastructure e.g. ports, hotels, and utilities. Social and economic disruptions relating to interruptions in the provision of services relating to telecommunications, electrical power, water supply; and sanitation."

Table 4.9 Impacts and Implications for the Human Settlements Sector (Cont'd)

IMPACTS	IMPLICATIONS
	Social and economic disruptions relating to interruptions in the provision of services relating to e.g. education and health. Increased stress on critical infrastructure. Interruptions in local, regional and international communication resulting from damage to and destruction of critical infrastructure. Damage to or destruction of critical infrastructure for example coastal roads and bridges would be disruptive to several types of economic, social and cultural activities. " Increased social unrest among the general population and the youth in particular, as a result of impacts relating to loss of employment and destruction of critical infrastructure. Increase in the rate of unemployment. Decline in social and economic development and productivity. Economic cost of relocating, replacing and/or repairing infrastructure, which has been destroyed, dislocated or damaged. Increased unemployment and social dislocation." Anticipated increase in the cost of insurance resulting in more properties being uninsured, particularly along the coast hence increasing the intensity of impacts and the length of recovery time after natural disasters. Increased cost of construction resulting from more stringent building codes and the enforcement of planning regulations as a means of reducing the impact of climate change. Negative impact on overall investment climate."
Climate Change Factor: **Sea Level Rise**	
• Inundation of low-lying areas. • Socio-economic and demographic dislocation resulting from land loss, destruction and/or damage to property, infrastructure and other components of the built environment.	Implications as stated above with the exception of those relating to landslides.

Table 4.9 Impacts and Implications for the Human Settlements Sector (Cont'd)

IMPACTS	IMPLICATIONS
Vulnerable locations/groups: Low lying coastal communities such as Dennery, Anse La Raye, sections of Castries City and the Gros Islet and Soufriere towns.	
Climate Change Factor: **Precipitation**	
• Increased flooding and landslides in periods of increased precipitation. * • Water shortages/drought in periods of decrease precipitation**. Vulnerable locations/groups: "*Low-lying coastal communities in the case of flooding; and settlements and developments established on hillsides and at high elevations in the case of landslides. ** Lower income rural and urban settlements with inadequate supplies of water and for persons depending on standpipes."	Implications as indicated for tropical cyclonic activity. Decreased precipitation not expected to have direct impacts on the components of human settlements being considered in this section.
Climate Change Factor: **Temperature**	
• Greater frequency of heat waves due to increased temperature and humidity* Vulnerable locations/groups: *Low-income groups are most likely to be living in dense settlements where humidity and heat from the urban landscape is likely to be most intense. Urban areas of Castries and Vieux Fort are likely to be worst affected, given the built up nature of the environment and the density of development there.	Increased use of air conditioning equipment; increased consumption of fossil fuels, higher electricity costs. Economic cost of improved ventilation and air conditioning in buildings. Increasing operating costs for commercial and other related establishments and increased energy bills for residential units. "Increased personal and public health cost relating to the higher incidence of illnesses associated with elevated temperature. Decline in social and economic development and productivity. Increased stress on public health system."

4.7 THE AGRICULTURE SECTOR

4.7.1 AGRICULTURE IN ST. LUCIA

St. Lucia is basically an agricultural economy and any significant change in climate on a global scale would impact on local agriculture, and therefore affect food supply and income. Several uncertainties limit the accuracy of current climate change projections. One relates to the degree of temperature increase and its geographic distribution. Another pertains to the concomitant changes likely to occur in precipitation patterns that determine the water supply to crops, and to the evaporative demand imposed on crops by the warmer climate. There is a further uncertainty regarding the physiological response of crops to enriched carbon dioxide in the atmosphere. The problem of predicting the future course of agriculture is compounded by the complexity of natural agricultural systems and of the socio-economic systems governing food supply and demand.

Limited land resources and the demands of a growing population have placed tremendous pressure on St. Lucia’s agricultural lands. The 1996 Census of Agriculture reported a total area on holding of 20770.5 hectares. This figure reflects a decrease of 2708.8 hectares or 11.5% compared to the census of 1986 (GOSL, 1996). The census reported a generally declining trend in total area dedicated to agriculture. The existing threats to the sector outlined in section 6.2 below and those posed by climate change, are expected to further reduce the availability of land suitable to agricultural production, and reduce crop yields.

Bananas are the main agricultural export of St. Lucia. They accounted for approximately forty eight percent (48%) of the 1999 Gross Domestic Product (GDP) for the agricultural sector and 4.24 percent of the total GDP (St. Lucia Economic and Social Review 1999). St. Lucia has traditionally been the largest exporter of bananas in the Windward Islands, with the island’s share of Windward Islands banana production having risen steadily from a low of 33.5 percent in 1973 to a high of 55.1 percent in 1996. Bananas are produced as a monocrop mainly on small holdings (i.e. holdings below 2.02 hectares) and on a few (i.e. 7-10) large estates (holdings of ten or more hectares). It is the most intensively cultivated crop, utilizing the bulk of agricultural (i.e. material) inputs in that sector. Irrigation in the cultivation process is generally a practice of the large estates. Banana should be cultivated on class I, II and III lands but due to the scarcity of such lands, a significant level of the production takes place on marginal lands such as steep slopes.

The livestock industry in St. Lucia has been growing in importance in the agriculture sector. The animals that have traditionally been kept are cattle, pigs, sheep, goats, and poultry. The Ministry of Agriculture has sought to develop the industry as part of its effort to diversify the agricultural product.

The contribution of the livestock industry has been increasing steadily over the years, from 4.98% in 1993 to 6.21% in 1996. St. Lucia’s developing livestock industry does not have the flexibility built into the system for adapting to extreme climatic events (such as changing the type of stock or mix of grazing livestock, cross breeding, relocating) due to limited financial and technological resources.

4.7.2 EXISTING THREATS TO THE AGRICULTURE SECTOR

- Development: Land clearing for residential and commercial developments and road construction.
- Pollution: use of agrochemicals, indiscriminate dumping of solid waste.
- Flooding: Lack of vegetative cover in watersheds creating flooding in low-lying areas.
- The rapid pace of globalization and international trade liberalization

- Reduced capacity of the banana industry to generate sufficient levels of production, affecting foreign exchange earnings.
- The movement of labour out of agriculture.
- A reduction in prices paid to farmers for crops, especially bananas.
- Adverse impacts of natural disasters such as hurricanes, storms, landslides and flooding.
- Degradation of soils and poor yields resulting from the cultivation of crops (particularly bananas) on marginal lands.
- The absence of proper soil and water conservation practices, particularly on steep terrain.
- Inappropriate land use: incompatibility between agricultural practices and land capability.

Table 4.10 Climate Change Impacts on Agricultural Sector

IMPACTS	IMPLICATIONS
Climate Change Factor: **Sea Level Rise**	
• Salinity of coastal agricultural zones. • Loss of freshwater due to saltwater intrusion. • Storm surge effects enhanced by sea-level rise	Irrigation with brackish water will most likely destroy crops and ruin soils. Salinity creating marginal lands or making marginal lands unsuitable for agriculture Physical loss of agricultural lands. Susceptibility of low-lying coastal agricultural lands to flooding. Loss of pasture for livestock. Intrusion of salt water into fresh water sources affecting the availability of water for irrigation.
Climate Change Factor: **Tropical Storm Activity**	
• The destruction of crops and livestock and the erosion of farm lands. • At the community level, there is the loss of life and property and the destruction of, or damage to agriculturally related infrastructure. • Poor water quality may be responsible for plant, animal and human health problems, including diseases associated with pathogenic organisms. • Soil erosion resulting from increased surface run off on exposed soils. • Siltation of river systems during periods of increased rainfall. • The livestock sector is usually significantly by storms primarily due to widespread damage and death of animals. Poultry and small ruminants suffer more extensively and may succumb to the battering of high winds and intense wetting.	Increased social and economic costs Loss of household income from agriculture. Increased unemployment. Loss of arable properties. Reduction in crop production. Increased deforestation. Decrease in potable water supplies. Increased rural to urban migration resulting from agricultural workers seeking alternative employment. Decreased food security.

Table 4.10 Climate Change Impacts on Agricultural Sector (Cont'd)

IMPACTS	IMPLICATIONS
Climate Change Factor: **Precipitation**	
Decreased precipitation: • Periods of low precipitation are likely to be accompanied by extended dry periods.	Drought causing heat stress on plants. Loss of soil moisture. Alteration of soil microorganism balance, and as a result increase of agricultural pests due to increasing life cycles. Weakened crops prone to insect attack and disease. Alteration of soil physical structure (e.g. creation of soil pans. Reduced crop production. High percentage of increase in both external and internal parasites in livestock; predisposition to,and increase in, diseases in livestock. Low fertility and reproductive rate for male and female livestock. Late maturation of offspring and increase in calf mortality. Increased atmospheric concentrations of CO_2 are likely to alter the carbon and nitrogen ratios of some forage plants decreasing palatability and nutritional quality of the forage (IPCC 1996). Increase of agricultural pests due to increasing life cycles. Crop destruction with resulting social and economic losses.
Increased frequency & Intensity of precipitation: • Flooding of agricultural lands. • Reduced hours of sunshine. • Excessive soil erosion. • Loss of water quality. • Silt deposition on agricultural lands. • Loss of soil nutrients. • Damage to farm infrastructure.	

Table 4.10 Climate Change Impacts on Agricultural Sector (Cont'd)

IMPACTS	IMPLICATIONS
Climate Change Factor: **Temperature**	
· Loss of soil moisture. · Alteration of soil microorganism balance. · Increase of agricultural pests due to increasing life cycles. · Weakened crops prone to insect attack and disease. · Alteration of physical structure of soils. · Loss of soil nitrogen due to high ambient temperatures. · Loss of irrigation efficiency. · Loss of livestock bodyweight. · High percentage of increase in both external and internal parasites in livestock. · Predisposition to and increase in diseases in livestock.	Implication the same as for decreased precipitation

4.8 THE TOURISM SECTOR

4.8.1 TOURISM IN ST. LUCIA

As is the case with many other Small Island Developing States (SIDS) in the Caribbean, the tourism industry in St. Lucia is characterized by a concentration of tourism superstructure, activities and infrastructure in coastal locations and has a direct dependence on the natural environment as its primary input. Natural resources and landscapes such as the Pitons, rainforest, Sulphur Springs, mineral baths, water falls, dive sites, beaches and historical sites represent the major attractions or "pull factors" for the visitor.

Since its inception in 1992, the internationally renowned St Lucia Jazz Festival has grown in prominence as one of the premier marketing tools for the sector. It now provides a further attraction in, addition to Heritage Tourism (which focuses on the marketing of attractions, sites and other products in rural communities), and Eco-tourism, which have both became increasingly important. Since the late 1970s, the tourism sector has made significant strides in marketing and promoting St. Lucia as a nature tourism destination. However, since tourism markets are growing rapidly, and active competition among tourist destinations is the norm, St. Lucia has found it necessary to promote itself as a specialized destination catering to tourist with specific interest in eco-tourism activity such as hiking, bird watching, camping and river bathing.

Surveys conducted by the St. Lucia Tourist Board in 1998 and 1999 revealed that, contrary to traditional belief that the pull factors for visitors to Caribbean islands are the "S.S.S" factors (Sea, Sun and Sand) these attractions actually rank fourth to the natural environment, the desire for peace and quiet and cultural heritage. The number one ranking of the natural Environment is highly significant in the present context in SIDS, the natural environment is one of the factors which is most vulnerable to the effects of climate change.

The tourism sector continues to expand, while maintaining its position as the second largest contributor to the real Gross Domestic Product (GDP). The 1999 contribution to GDP stood at 12.9 percent, second only to wholesale and retail, which topped the ranking with a contribution of 13.96 percent (Economic and Social Review 1999). Tourism as an industry is by a wide margin the largest contributor to the island's foreign exchange earnings. The impact of tourism in St. Lucia manifests itself in a variety of ways, the most significant of which is the direct and indirect contribution that the sector makes to employment. As at December 1999, tourism directly employed 11,766 persons on a full time basis, which accounted for approximately sixteen percent (16%) of the total labour force of 73,000[1] , (The Government Statistical Department, 1999).

Tourism also provides a source of revenue through the taxes and other direct and indirect revenue that it generates. Such revenue will inevitably benefit the local population when it is spent to provide and improve public services, in for example, the education, sports and health sectors. In addition, the tourism industry provides linkages to most other productive economic sectors such as agriculture and manufacturing. With these linkages, tourism is probably the single largest contributor to economic activity in St. Lucia. The strong performance of the sector during the 1990s has contributed to the gradual transformation of the economy from a product- oriented one to one that is becoming service-oriented. The Government has therefore identified tourism, and services in general, as the leading growth sectors and the growth engines that will play the leading role in realizing the economic development vision which is aimed at strengthening, modernizing and repositioning the island's economy.

4.8.2 POTENTIAL IMPACTS OF CLIMATE CHANGE ON THE TOURISM SECTOR

Climate change is expected to affect tourism in many ways, both directly and indirectly. It would appear that anthropogenic climate change will have significant negative impacts on the physical environment and natural resources which represent the inputs of the sector and consequently, equally significant negative impacts on the island's economy. The impacts will be reflected in the loss of beaches due to erosion; inundation due to sea level rise, degradation of various ecosystems on which the industry relies and damage to critical superstructure and infrastructure. These impacts have the potential to seriously destroy the tourism resource base of vulnerable SIDS like St. Lucia, making them less attractive tourism destinations.

It must be noted that while these impacts can also be caused by non-climate change related activity, it is increasingly being proven that climate change is likely to cause similar adverse impacts with severe repercussions for the socio-economic and socio-cultural existence of SIDS. Tourism is so vital to the St. Lucian economy that if there were to be any notable contraction in the industry due to loss and/or damage to physical plant, infrastructure or resources (and consequently reduced employment and revenue), the rate of national economic growth would decline significantly. In such circumstances, the provision of many essential services would be put at risk and vital services such as health and education, whose budgetary allocations are determined by tourism revenue, would also be jeopardized.

To gain a proper appreciation of the extent of impacts as it relates to the tourism industry, it is necessary to first define the nature of the resource base on which the sector depends. The resource base in this context is the entire island, comprising all its human and non-human, components and the associated stresses they present; and the socio-cultural value attached to particular sections of the environment by the local population, for example, to beaches and historical sites and landmarks such as the Pigeon Island National Park and the Maria Islands Nature Reserve. Any discussion of impacts will therefore have to cover all components of that system, which would comprise the various ecosystems (i.e. marine and coastal, rainforest and the fresh water ecosystems) and the various economic sectors that they support.

As the impacts on some of these components of the island system have already been dealt with in detail by other sections of this chapter, the focus here will be on the components of the natural and man made environment to which the human population has attached socio-cultural value and on the tourism related infrastructure (such as hotels, restaurants, air and sea ports, roads, and telecommunication and other utilities). Table 10 below provides some specific detail on the implication of the anticipated impacts on the aforementioned components of the island system.

Table 4.11 Anticipated Impacts on Tourism Related Infrastructure and the Environment to which the Population has attached Socio-cultural Value

IMPACTS	IMPLICATIONS
Sea level rise and tropical cyclonic activity are the main aspects of climate change to be considered.	Loss of income and livelihoods resulting from damage to or loss of tourism related property/ amenities; and the destruction and/or damage to coastal infrastructure e.g. airports and seaports, hotels, restaurants, roads and infrastructure related to the services indicated above.
• Altered frequency and/or intensity of extreme events - storms, hurricanes, landslides and flooding.	Economic cost of relocating, replacing and/or repairing infrastructure, which has been destroyed, dislocated or damaged.
• Inundation of low-lying coastal areas due to sea level rise.	Economic disruptions relating to interruptions in the provision of telecommunications, electrical power, water and sanitation services.
• Socio-economic and demographic dislocation resulting from land loss, destruction and/or damage to property, infrastructure and other components of the built environment, resulting from the impacts stated above.	Negative impact on investment climate in the tourism sector.
	Anticipated increase in the cost of insurance for tourism related properties.
Vulnerable locations/groups:	
Coastal communities particularly those established on the west coast.	Social disruption resulting from the loss of geographical locations and physical structures (e.g. beaches, archaeological and historical sites, parks, landmarks, museums etc), which constitute the core of cultural and historical existence of the population.
	Breakdown of societal norms as distinct societies and cultures become threatened with drastic changes in lifestyle or the need to abandon ancestral homes.

4.9 RECOMMENDATIONS FOR ADAPTATION

The preceding sectoral assessments of the likely impacts of climate change associated with the scenarios utilized point to the potential for far-reaching adverse impacts upon the natural and built environments, as well as on socio-economic activities in St. Lucia. This is due to a number of factors including the natural resource dependency of the economy (centered around tourism and agriculture), small size which means that all geographic regions are impacted (e.g. during a drought or hurricane), and the increasing non-climate anthropogenic impacts on limited natural resources (pollution, over-harvesting, deforestation, etc).

The sectoral assessments also identify a range of interventions that are aimed at enabling sectoral and national level adaptation to the challenges likely to be posed by climate change. However it is possible to categorize these adaptation recommendations into the following broad approaches:

- *Sectoral* - such as improving agricultural varieties to be able to withstand projected elements of climate change;
- *Multi sectoral* – such as improved watershed and coastal area management, activities with multiple benefits across sectors;
- *Cross sectoral* - such as public awareness and climate research and data collection.

Adaptation involves developing and institutionalizing various levels of capacity, as well as developing expertise and building knowledge through research and monitoring. Similarly, actions to optimize the health and sustainability of important ecosystems sensitive to climate change – such as coral reefs and/or moist forests – will be most effective if begun early while these systems are still relatively intact. Anticipatory approaches can also greatly reduce the need for forced *ad hoc* responses at a later date when loss of resources and poorly planned development will likely limit the range of adaptation options available (IGCI/SPREP, undated).

Select Adaptation Options for St. Lucia

COASTAL ZONE
Relocation and retreat of structures and activities
Restrictions on future development
Sea-walls, levees etc
Reinforcing existing structures e.g. docks
Flood plain management plan
Building codes
Mangrove habitat protection and reforestation
Raising coastal bridges and roads
Guidelines and restriction of sand mining

HUMAN SETTLEMENTS
Inland relocation
Upgrading planning legislation (building codes, EIA etc)
Community based resource management
Public awareness
Use of traditional knowledge
Development of climate change database
Hazard mapping
Coastal protection measures

FRESHWATER
Reductions in line losses
Accurately reflecting costs of water
Restoration of riverbanks and wetlands
Water conservation
Public awareness
Improved management of forest resources including private forests
Strengthening data collection
Development of a national water management plan

AGRICULTURE (including Bananas)
Introduction of salt-tolerant species
Hydroponics
Public awareness
Introduction of heat and drought-tolerant crops
Crop research
Use of greenhouses
Protection of forested areas
Farm relocation
Improved pest and disease management
Restoration of degraded lands
Agricultural diversification
Reduced livestock stocking rates

FORESTRY
Development and enforcement of land use policy
Legislation and regulations
Promotion of agroforestry
Preservation of watersheds including compulsory acquisition
Reforestation
Public awareness
Wetlands protection
Urban forestry

FISHERIES
Resource and ecosystem monitoring
Public awareness
Strengthening environmental legislation
New fishing technologies
Efficient processing facilities
Regional and international cooperation
Development of a Fisheries Management Plan incorporating climate change

TOURISM
Relocation of structures
Strengthened development controls
Economic diversification
Hard and soft coastal engineering protection measures
Flood control

HEALTH
Public awareness
Surveillance and monitoring
Infrastructure development
Engineering and technological responses
Medical interventions

Consideration must be given to the high degree of uncertainty that still surrounds efforts to forecast long-term trends in weather and climate patterns as a result of climate change. This results in conflicting messages going to policy makers and decision makers and makes it difficult to take decisions based solely on considerations pertaining to climate change. Against this background of uncertainty, criteria for recommending adaptation actions should embody, as far as possible:

- Be supportive of wider non-climate development policy goals and objectives,
- Enhance knowledge of existing weather and climate patterns;
- Reduce vulnerability to existing climate variability;
- Be environmentally sustainable; and
- Be economically/financially viable

Flexibility and practicality in identifying adaptation options are particularly important in the context of small developing countries like St Lucia where limited spatial, financial and human resources exist as inbuilt constraints to sustainable development.

Central elements for adapting to climate change are:

a) Data collection and data management.

b) Public awareness.

c) Coastal area management.

d) Integrated water resource management.

e) Land use planning and development control.

f) Capacity building.

4.10 CONCLUSION

Anthropogenic climate change will clearly pose tremendous development challenges for St. Lucia. Its effects and impacts are likely to include increases in air and sea surface temperatures, increasing variability in rainfall patterns (more severe droughts and more severe heavy rainfall episodes), increased frequency and intensity of tropical storms and hurricanes, and increased coastal erosion and inundation brought about by rising sea levels. Opportunities for positive growth and development are likely to be severely threatened by diverse impacts to the country's fragile natural resource base and consequently to its resource dependent economic sectors particularly tourism and agriculture.

The wide-ranging impacts will require a range of adaptive responses, and in most cases, Government will be required to take a lead role in terms of creating the enabling environment for empowering appropriate action at the personal, household, enterprise, sectoral, community and national levels. Critical in this respect will be the roles of information dissemination and awareness building. Efforts will need to be intensified to assess the extent of changes in climate and weather-related parameters particularly in the coastal environment, and for sensitive ecosystems such as watersheds and wetlands. At the same time, public awareness, both of a general and technical nature, will need to be heightened among relevant stakeholders if they are to be able to take appropriate actions and make realistic decisions. Government must at the same time establish a policy framework for climate change adaptation that promotes actions which address existing stresses and enhance wider attempts to achieve sustainable human development.

Sectoral assessments point to the importance of the Government of St. Lucia and other stakeholders continuing efforts to diversify the economic base of the country. This will reduce the negative effects of adverse impacts on a particular sector. However it is recognized that this has not been, and will not be, easy to achieve particularly in a rapidly globalized economy. Nevertheless, the analyses clearly suggest the relevance, from a climate change perspective, of continued national efforts at economic diversification.

One important factor underlying all of the efforts to respond to the challenge of climate change will be the issue of the political will to tackle such a long-term, task. Climate change will occur across time frames that far exceed the normal time horizon for political decision-making. Additionally, many of the adaptive actions identified involve taking anticipatory actions are likely to be resisted (at least initially) by important stakeholder groups and are therefore likely to be politically sensitive. This instituion will be further aggravated by the level of uncertainty surrounding the extent and impacts of climate change in St. Lucia. These complicating political realities will require resolute leadership guided by the best available scientific and technical information.

At the same time, St. Lucia and other Caribbean and small island States must also intensify their efforts to bring to the fore at international fora, the question of adoption of measures for addressing climate change. Particular emphasis should be placed in seeking reduction, to sustainable levels, of global greenhouse gas emissions that threaten to destroy the ecological and social structures so essential to St. Lucia's survival.

GENERAL DESCRIPTION OF STEPS TAKEN

5.1 INTRODUCTION

The UNFCCC (Article 12.1 (b) requires that Parties to the Convention provide a general description of steps taken in the implementation thereof. St. Lucia has undertaken a number of activities in fulfillment of its obligations under the Convention.

5.2 POLICY FRAMEWORK

Under the CPACC Project, St. Lucia has prepared a Climate Change Adaptation Policy as well as an Adaptation Strategy. The National Climate Change Adaptation Policy:

1. Expresses the Government of St. Lucia's recognition of the fact that Climate Change is indeed occurring and that it has significant implications for St. Lucia;
2. States the objectives of Government's National Climate Policy including: a) avoiding, minimising or adapting to the negative impacts of climate change on St. Lucia's natural, economic and social systems; and b) fostering the development and application of appropriate legal and institutional systems and management mechanisms for planning for, and responding to, climate change;
3. States the principles which will guide the implementation of policy including stakeholder involvement, public awareness and involvement in international negotiations;
4. Identifies objectives and broad action areas under various areas/resource categories including agriculture, human health, water resources, tourism and coastal resources. These include the conduct of appropriate climate change monitoring and data gathering programmes; formulation of a national land use plan; incorporation of climate change considerations into national health planning; conduct of an inventory of water resources, including ground-water and development and implementation of appropriate building regulations;
5. Identifies appropriate planning and management mechanisms including the establishment of appropriate legal and administrative systems and the development of an appropriate database and information exchange network;
6. Identifies key agencies; and
7. Makes appropriate provisions for monitoring and review, through the National Climate Change Committee which was re-established in 1999 with the sanction of Cabinet.

The National Climate Change Adaptation Strategy attempts to build on the Policy by identifying and rationalizing appropriate strategies and actions according to priority, time frame, resource needs and institutional responsibility (scope).

The Adaptation Policy identifies the Ministry of Planning as the agency with responsibility for Climate Change activities. As such, that Ministry is mandated to co-ordinate implementation of the NCCA. Additionally, the National Climate Change Committee, or its successor, shall monitor the implementation of the Strategy and shall provide guidance to the Ministry of Planning and the other agencies involved in implementation of the Strategy. The Committee shall also ensure that St. Lucia fulfils its obligations under the UNFCCC, the Kyoto Protocol and other related regional and international conventions and agreements.

Given the scope of the NCCA and the multiplicity of activities to be undertaken simultaneously in the implementation thereof, there will be need for a dedicated unit within the Ministry of Planning to coordinate efforts to this end. This proposed *Climate Change Unit* shall be provided with appropriate professional, technical and administrative resources to allow it to fulfil its mandate. It is recognized, however, that to a large extent, NCCA activities are to form part of the work programmes of numerous agencies. The Climate Change Unit shall therefore serve as the Secretariat to the Climate Change Committee, or its successor body, while co-ordinating implementation of the Strategy, and also implementing certain key activities falling thereunder.

5.3 SYSTEMATIC OBSERVATION AND RESEARCH

The Meteorological Office is head quartered at the Hewanorra International Airport and is the centre of St. Lucia’s climate observation system. Its functions include the systematic collection of meteorological data for the island; providing weather-related information for aviation and shipping purposes and providing weather forecasts to the general public. It is also the official source of information on cyclonic events during the hurricane season. In this regard, it is a critical component of the national emergency management system.

The Meteorological Office collects data on a number of climatic parameters including rainfall, temperature, atmospheric pressure, humidity, wind speed and direction. Records date back as far as 1973. In recent years, the work of the Office has been assisted by the installation of a tidal gauge acquired under the CPACC project. This gauge monitors, *inter alia*, air temperature, sea temperature, tidal data, wind speed and wind direction. The data collected is also up-loaded, via satellite, to the Institute of Marine Affairs in Trinidad where it is processed.

At the regional level, a number of agencies play significant roles in systematic research and observation. These include:

The Caribbean Disaster Response Agency (CDERA);

The Caribbean Meteorological Organization; and

The Caribbean Institute of Meteorology and Hydrology (CIMH).

With respect to monitoring of coastal processes, the Department of Fisheries of the Ministry of Agriculture, Fisheries and Forestry has an ongoing programme which involves the monitoring of beach profiles. The Department also undertakes work on coral reef monitoring in collaboration with non-governmental organisations.

While some systems and programmes exist for systematic research, these are limited by financial, human and technical constraints. The Meteorological service, for example, is in need of additional trained personnel and equipment. One area which requires particular attention is that of research and monitoring as regards terrestrial ecosystems.

5.4 PUBLIC AWARENESS AND EDUCATION

Public awareness and education is recognized as being critical to the process of responding to climate change. Since, 1999, a number of activities have been undertaken to enhance knowledge and awareness in an effort to build support for climate change initiatives. A number of climate change articles have been published in the national newspapers. These have highlighted developments at the national, regional and international levels. Press releases have also been carried over the electronic media.

Since 1999, stakeholders in the National Communication implementation process have been interviewed by the electronic media. In addition, stakeholders have taken part in panel discussions and similar forums. In general, the mass media have been supportive of climate change activities and have given workshops and other events a good deal of coverage. One welcome development has been the spontaneous reporting on climate issues in the mass media without waiting for information to be provided by Government sources.

In June 2000, the Government of Saint Lucia launched its official climate change web site (www.climatechange.gov.lc). The responses to this site have been favorable and it continues to be visited on a regular basis.

In 2000, the Ministry of Planning, Development, Environment and Housing undertook a climate change awareness campaign in secondary schools around the island. Thirteen secondary schools were visited and approximately 2000 students targeted.

In July 2001 with the support of the Ministry of Planning, the Insurance Council of Saint Lucia held a climate change awareness seminar for its members, the first in the Caribbean. Technical support was provided by the CPACC project.

A great deal of support has been obtained through stakeholder consultations and workshops. By adopting a participatory approach to the implementation of climate change projects, it has been possible to build stakeholder awareness, interest and involvement.

Notwithstanding the achievements to date, it is clear that there is a great deal of work to be done in the area of public awareness. There is a need to deepen and widen the education and sensitization process and to target specific audiences in a more systematic manner. It is recognized that many St. Lucians are not knowledgeable on climate change issues and that the population as a whole will have to be convinced that the impacts thereof could fundamentally affect their lives.

5.5 CAPACITY BUILDING

In order for St. Lucia to effectively address issues arising out of the climate change phenomenon, it must develop the necessary institutional capacity. As a Small Island Developing State, however, St. Lucia is faced with significant financial, technical and human resource constraints which impinge negatively on its ability to do so. Notwithstanding, some significant steps have been taken in this direction.

Under the programme of Enabling Activities, a number of nationals have received training in:

a) Inventory of Greenhouse Gases;
b) Vulnerability and Adaptation Assessment; and
c) Web Site Design.

The CPACC Project has also provided training, particularly in the areas of:

d) Database Management and Administration;
e) Data Automation; and
f) Economic Valuation of Coastal Resources.

Useful expertise has been acquired through the preparation of St. Lucia’s First National Communication and its various supporting studies; the development of the country’s adaptation policy and strategy under CPACC and the development and implementation of public education and awareness activities.

Technical capacity at the national level has been enhanced in various areas. Through both the Enabling Activities and the CPACC Project, computers have been acquired to further the work of agencies involved in climate change activities. CPACC has also funded the development of a digitized Coastal Resource Inventory System (CRIS) and made available appropriate Geographical Information System (GIS) software. In addition, the island’s first, and to date only, tidal gauge was also obtained through CPACC.

The implementation of the Programme of Enabling Activities and the CPACC Project has resulted in the designation of the Ministry of Planning, Development, Environment and Housing as the Focal Point for climate change activities. It has also led to the re-invigoration and expansion of the National Climate Change Committee.

5.6 OTHER INITIATIVES

In addition to climate change-related activities, a number of initiatives have been taken at the national level which are confluent with, and supportive, thereof. These include:

- Initiation of a National Land Policy formulation process;
- Development and adoption of a Sustainable Energy Plan;
- Institutional Review of Environmental Management; and
- Preparation of a Biodiversity Strategy and Action Plan.

FINANCIAL AND TECHNOLOGICAL REQUIREMENT

6.1 FINANCIAL & TECHNOLOGICAL REQUIREMENTS

The effects of climate change will have far reaching implications for all aspects of life in St. Lucia. Therefore, steps must be taken to address all relevant issues in a proactive, coordinated manner. Given St. Lucia's limited human, financial and technological resources, regional and international cooperation and support will be required in a number of key areas.

Climate Change Education and Awareness

Meaningful action in addressing climate change can only be achieved if there is commitment based on adequate awareness, knowledge and access to information at all levels. Accordingly, it will be necessary to target relevant audiences and to develop and implement appropriate strategies.

Goal: To achieve meaningful implementation of climate change strategies, plans and actions through the enhancement of education and awareness among target audiences.

Objectives:

- Enhance the level of knowledge and awareness among decision-makers, stakeholders and the general public on climate change issues;
- Improve the flow of climate change-related information between stakeholders and to the general public;
- Influence decision-making and behaviour among relevant target groups in order to achieve desired results.

Strategies & Actions:

- Development and implementation of an integrated, coordinated and sustained climate change education and awareness programme targeting all sectors and relevant interest groups.
- Establishment of a climate change information storage and exchange mechanism.

Incorporation of Climate Change Issues Into the Development Planning Process

The successful implementation of a holistic, integrated national climate change strategy will require, inter alia, that climate change issues and considerations be incorporated into the national planning process. Currently, St. Lucia is looking towards adopting an Integrated Development Planning (IDP) approach.

Goal: To ensure the effective implementation of climate change strategies, plans and actions through the incorporation of climate change considerations into the planning and resource allocation process.

Objectives:

- Build Institutional Capacity to analyse climate change issues;
- Strengthen data and information collection and processing capabilities within relevant institutions;
- Establish suitable institutional frameworks for programming, coordination and implementation of relevant activities.

Actions:

- Undertake training activities in areas relating to planning and data processing;

- Establish a national Climate Change Unit;
- Develop a national climate change framework in the context of a larger national planning framework.

Implementation of St. Lucia's Sustainable Energy Plan (SEP)

The Government of St. Lucia has formulated and adopted a Sustainable Energy Plan. This Plan is expected to guide the development of St. Lucia's energy sector for the next 10 years. It places strong emphasis on the use of renewable energy technologies as well energy conservation and efficiency. Financial and technical support will be required in implementing many aspects of the SEP.

Aim: To promote sustainable energy development and achieve reductions in greenhouse gas emissions through the implementation of the SEP

Objectives:

- Achieve the reduced use of conventional powers sources;
- Increase the use of renewable energy technologies;
- Promotion and adoption of energy conservation measures
- Reduce the emission of GHGs.

Strategies & Actions:

- Build institutional capacity for energy sector planning and evaluation of RETs;
- Develop appropriate regulatory framework for the successful implementation of the SEP
- Develop and implement education and awareness programme to support SEP
- Conduct research into RET potential and energy efficiency measures

Sectoral and Resource Management Requirements

It has been recognized that a number of key issues will need to be considered as they pertain to particular sectors or resources. The following is a list of priority areas identified at the national level.

Coastal & Marine Resources

Undertake review of existing coastal monitoring and data collection systems.

Implement integrated coastal zone management plans

Human Settlements

Develop adaptation plan for human settlements including zoning, defenses, building codes etc.

Terrestrial Resources, Terrestrial Biodiversity& Agriculture

Establish a system for improved monitoring and research of key terrestrial and agricultural processes and resources.

Freshwater resources

Undertake inventory of freshwater resources and develop and implement a National Water Resources Management Plan.

Tourism

Improve/ develop a regulatory framework with emphasis on enforcement.

Regional Initiatives

St. Lucia is committed to participating in regional and international initiatives. This is exemplified by the country's participation in the CPACC Project. Given the successes achieved to date by CPACC, and recognizing the need for a regional entity to coordinate Caribbean response to climate change, St. Lucia calls for, and supports efforts towards, the establishment of a Caribbean Climate Change Centre.

National Communications Process and Follow-up Activities

Based on the experience obtained during the preparation of St. Lucia's First National Communication to the UNFCCC, the following have been identified as areas where assistance would be required and which would merit the attention and support of the Global Environmental Facility (GEF):

1. Building capacity to resolve issues regarding emissions factors and to better address Land Use, Land Use Change and Forestry (LULUCF) computations;
2. Enhancing data collection, management and processing;
3. Identification and implementation of country-specific Stage II and III adaptation measures;
4. Developing national capacity for water resource planning and management;
5. Establishing systems for enhanced exchange of information and experiences within the region, as well as between regions;
6. Developing and implementing integrated resource/spatial management plans;
7. Implementing energy conservation and renewable energy pilot projects;
8. Enhancing capacity for disaster planning and management;
9. Enhancing early warning systems for extreme weather events;
10. Enhancing capacity to participate in international climate change initiatives and negotiations.

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APPENDICES

Country	St. Lucia
Inventory Year	1994
Title of Inventory	St.Lucia GHG Inventory
Contact Name	Crispin d'Auvergne
Title	Project Coordinator
Organisation	Sustainable Development Unit
Address	Ministry of Finance snd Planning
	Graheam Louisy Building, Castries
	St. Lucia
Phone	(1-758) 451 8746
Fax	(1-758) 451 6958
E-Mail	estplanning@candw.lc
Is uncertainty addressed?	Yes
Related documents filed with IPCC	All relevant Worksheets

TABLE 1 SECTORAL REPORT FOR ENERGY
(Sheet 1 of 3)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)							
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	NO_x	CO	NMVOC	SO_2 (1)
Total Energy	**268**	**0.08056**	**0.00251**	**1**	**12.00861**	**2**	**607**
A Fuel Combustion Activities (Sectoral Approach)	**268**	**0.08056**	**0.00251**	**1**	**12.00861**	**2**	**607**
1 Energy Industries	**121**	**0.00494**	**0.00099**	**0**	**0.02472**	**0**	**0**
a Public Electricity and Heat Production							
b Petroleum Refining							
c Manufacture of Solid Fuels and Other Energy Industries							
2 Manufacturing Industries and Construction	**6**	**0.00005**	**0.00002**	**0**	**0.00027**	**0**	**0**
a Iron and Steel							
b Non-Ferrous Metals							
c Chemicals							
d Pulp, Paper and Print							
e Food Processing, Beverages and Tobacco							
f Other (please specify)							

(1) Please provide links from Worksheet 1-4 for each sector where applicable.

TABLE 1 SECTORAL REPORT FOR ENERGY

(Sheet 2 of 3)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)							
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	NO_x	CO	NMVOC	SO_2
3 Transport	**104.65732**	**0.02752**	**0.00090**	**0.93572**	**10.84079**	**2.03476**	**0.00000**
a Civil Aviation	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
b Road Transportation	103.92430	0.02752	0.00090	0.93572	10.84079	2.03476	
c Railways	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
d Navigation	0.73302	0.00000	0.00000	0.00000	0.00000	0.00000	
e Other (please specify)	0.00000						
Pipeline Transport	0.00000						
4 Other Sectors	**33.47780**	**0.04790**	**0.00059**	**0.04585**	**1.14284**	**0.06061**	**0.00000**
a Commercial/Institutional	28.32342	0.00265	0.00016	0.02652	0.00530	0.00133	
b Residential	5.03968	0.04524	0.00043	0.01856	1.13690	0.05916	
c Agriculture/Forestry/Fishing	0.11471	0.00000	0.00000	0.00077	0.00064	0.00013	
5 Other (please specify)	**2.97439**	**0.00014**	**0.00002**	**0.02298**	**0.00000**	**0.00575**	
B Fugitive Emissions from Fuels	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**
1 Solid Fuels	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**
a Coal Mining		0.00000					
b Solid Fuel Transformation							
c Other (please specify)							
2 Oil and Natural Gas	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**
a Oil		0.00000		0.00000	0.00000	0.00000	0.00000
b Natural Gas		0.00000					
c Venting and Flaring		0.00000					

TABLE 1 SECTORAL REPORT FOR ENERGY
(Sheet 3 of 3)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)							
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	NO_x	CO	NMVOC	SO_2
Memo Items [(1)]							
International Bunkers	**67.78921**	**0**	**0**	**0**	**0**	**0**	**0**
Aviation	60.82695	0	0	0	0	0	0
Marine	6.96226	0	0	0	0	0	0
CO_2 Emissions from Biomass	**18.95604**						

(1) Please do not include in energy totals.

TABLE 2 SECTORAL REPORT FOR INDUSTRIAL PROCESSES
(Sheet 1 of 2)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES
(Gg)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	NO_x	CO	NMVOC	SO_2	HFCs		PFCs		SF_6	
								P	A	P	A	P	A
Total Industrial Processes	**0.00000**	**0.00000**	**0**	**0**	**0**	**1.96207**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
A Mineral Products	**0.00000**	**0.00000**	**0**	**0**	**0**	**1.70873**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1 Cement Production	0.00000						0						
2 Lime Production	0.00000												
3 Limestone and Dolomite Use	0.00000												
4 Soda Ash Production and Use	0.00000												
5 Asphalt Roofing					0	0.00000							
6 Road Paving with Asphalt						1.70873							
7 Other (please specify)	0.00000	0.00000	0	0	0	0.00000	0	0	0	0	0	0	0
Glass Production						0.00000							
Concrete Pumice Stone							0						
B Chemical Industry	**0.00000**	**0.00000**	**0**	**0**	**0**	**0.00000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1 Ammonia Production	0.00000				0	0.00000	0						
2 Nitric Acid Production			0	0									
3 Adipic Acid Production			0	0	0	0.00000							
4 Carbide Production	0.00000	0.00000											
5 Other (please specify)		0.00000		0	0	0.00000	0						
C Metal Production	**0.00000**	**0.00000**	**0**	**0**	**0**	**0.00000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1 Iron and Steel Production	0.00000			0	0	0.00000	0						
2 Ferroalloys Production	0.00000												
3 Aluminium Production	0.00000			0	0		0				0		
4 SF_6 Used in Aluminium and Magnesium Foundries													0
5 Other (please specify)	0.00000												

P = Potential emissions based on Tier 1 Approach. A = Actual emissions based on Tier 2 Approach. This only applies in sectors where methods exist for both tiers.

TABLE 2 SECTORAL REPORT FOR INDUSTRIAL PROCESSES
(Sheet 2 of 2)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)													
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	NO_x	CO	NMVOC	SO_2	HFCs		PFCs		SF_6	
								P	A	P	A	P	A
D Other Production	**0**	**0**	**0**	**0**	**0**	**0.25334**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1 Pulp and Paper				0	0	0.00000	0						
2 Food and Drink						0.25334							
E Production of Halocarbons and Sulphur Hexafluoride	**0**	**0**	**0**	**0**	**0**	**0.00000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1 By-product Emissions									0		0		
2 Fugitive Emissions									0		0		
3 Other (please specify)													
F Consumption of Halocarbons and Sulphur Hexafluoride	**0**	**0**	**0**	**0**	**0**	**0.00000**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
1 Refrigeration and Air Conditioning Equipment									1		0		
2 Foam Blowing									0		0		
3 Fire Extinguishers									0		0		0
4 Aerosols									0		0		
5 Solvents									0		0		
6 Other (please specify)									0		0		0
G Other (please specify)													

P = Potential emissions based on Tier 1 Approach. A= Actual emissions based on Tier 2 Approach. This only applies in sectors where methods exist for both tiers.

TABLE 3 SECTORAL REPORT FOR SOLVENT AND OTHER PRODUCT USE
(Sheet 1 of 1)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)			
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	N_2O	NMVOC
Total Solvent and Other Product Use	**0**	**0**	**0**
A Paint Application			
B Degreasing and Dry Cleaning			
C Chemical Products, Manufacture and Processing			
D Other (please specify)			

Please account for the quantity of carbon released in the form of NMVOC in both the NMVOC and the CO_2 columns.

Note: The Revised 1996 IPCC Guidelines do not provide methodologies for the calculation of emissions of N_2O from solvent and other product use. If you have reported such data, you should provide additional information (activity data and emission factors) used to make these estimates.

TABLE 4 SECTORAL REPORT FOR AGRICULTURE

(Sheet 1 of 2)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)					
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CH_4	N_2O	NO_x	CO	NMVOC
Total Agriculture	**0.49095**	**0.04777**	**0.00000**	**0.00000**	**0**
A Enteric Fermentation	**0.44497**				
1 Cattle	0.37057				
2 Buffalo	0.00000				
3 Sheep	0.00624				
4 Goats	0.04857				
5 Camels and Llamas	0.00000				
6 Horses	0.00443				
7 Mules and Asses	0.00000				
8 Swine	0.01466				
9 Poultry	0.00050				
10 Other (please specify)					
B Manure Management	**0.04518**	**0.00000**			
1 Cattle	0.01063				
2 Buffalo	0.00000				
3 Sheep	0.00026				
4 Goats	0.00214				
5 Camels and Llamas	0.00000				
6 Horses	0.00054				
7 Mules and Asses	0.00000				
8 Swine	0.02932				
9 Poultry	0.00230				

TABLE 4 SECTORAL REPORT FOR AGRICULTURE

(Sheet 2 of 2)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)					
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CH_4	N_2O	NO_x	CO	NMVOC
B Manure Management (cont...)					
10 Anaerobic		0			
11 Liquid Systems		0			
12 Solid Storage and Dry Lot		0			
13 Other (please specify)		0			
C Rice Cultivation	**0.00080**				
1 Irrigated	0.00080				
2 Rainfed	0.00000				
3 Deep Water	0.00000				
4 Other (please specify)					
D Agricultural Soils		**0**			
E Prescribed Burning of Savannas	**0.00000**	**0**	**0**	**0**	
F Field Burning of Agricultural Residues [(1)]	**0.00000**	**0**	**0**	**0**	
1 Cereals					
2 Pulse					
3 Tuber and Root					
4 Sugar Cane					
5 Other (please specify)					
G Other (please specify)					

Note: The Revised IPCC 1996 Guidelines do not provide methodologies for the calculation of CH_4 emissions, and CH_4 and N_2O removals from agricultural soils, or CO_2 emissions from savanna burning or agricultural residues burning. If you have reported such data, you should provide additional information (activity data and emissions factors) used to make these estimates.

(1) Sub-items of F should be linked to Worksheet 4-4 sheets 1 and 2.

TABLE 5 SECTORAL REPORT FOR LAND-USE CHANGE AND FORESTRY

(Sheet 1 of 1)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)						
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 Emissions	CO_2 Removals	CH_4	N_2O	NO_x	CO
Total Land-Use Change and Forestry	(1) **0.00000**	(1) **-352.1047**	**0.29700**	**0.00204**	**0.07380**	**3**
A Changes in Forest and Other Woody Biomass Stocks	(1) **0.00000**	(1) **-516.0599**				
1 Tropical Forests						
2 Temperate Forests						
3 Boreal Forests						
4 Grasslands/Tundra						
5 Other (please specify)						
B Forest and Grassland Conversion	**68.06250**		**0.29700**	**0.00204**	**0.07380**	**3**
1 Tropical Forests	68.06250					
2 Temperate Forests	0.00000					
3 Boreal Forests	0.00000					
4 Grasslands/Tundra	0.00000					
5 Other (please specify)	0.00000					
C Abandonment of Managed Lands		**0.0000**				
1 Tropical Forests		0.0000				
2 Temperate Forests		0.0000				
3 Boreal Forests		0.0000				
4 Grasslands/Tundra		0.0000				
5 Other (please specify)		0.0000				
D CO2 Emissions and Removals from Soil	(1) **95.89268**	(1) **0.0000**				
E Other (please specify)						

(1) The formula does not provide a total estimate of both CO_2 emissions and CO_2 removals. It estimates “net” emissions of CO_2 and places a single number in either the CO_2 emissions or CO_2 removals column, as appropriate. Please note that for the purposes of reporting, the signs for removals are always (-) and for emissions (+).

TABLE 6 SECTORAL REPORT FOR WASTE
(Sheet 1 of 1)

SECTORAL REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)						
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [(1)]	CH_4	N_2O	NO_x	CO	NMVOC
Total Waste	**0.00000**	**27.79905**	**0.01794**			
A Solid Waste Disposal on Land	**0.00000**	**27.79905**	**0.00000**			
1 Managed Waste Disposal on Land						
2 Unmanaged Waste Disposal Sites						
3 Other (please specify)						
B Wastewater Handling	**0.00000**	**0.00000**	**0.01794**			
1 Industrial Wastewater		0.00000				
2 Domestic and Commercial Wastewater		0.00000	0.01794			
3 Other (please specify)						
C Waste Incineration						
D Other (please specify)						

(1) Note that CO_2 from waste disposal and incineration should only be included if it stems from non-biological or inorganic waste sources.

TABLE 7A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES
(Sheet 1 of 3)

SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)														
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 Emissions	CO_2 Removals	CH_4	N_2O	NO_x	CO	NMVOC	SO_2	HFCs		PFCs		SF_6	
									P	A	P	A	P	A
Total National Emissions and Removals	**268**	**-352**	**28.66757**	**0.07026**	**1.41322**	**14.60736**	**4.07157**	**0.00000**	**0**	**1.33630**	**0**	**0**	**0**	**0**
1 Energy	**268**	**0**	**0.08056**	**0.00251**	**1.33942**	**12.00861**	**2.10949**	**0.00000**						
A Fuel Combustion (Sectoral Approach)	268		0.08056	0.00251	1.33942	12.00861	2.10949							
1 Energy Industries	121		0.00494	0.00099	0.32956	0.02472	0.00824							
2 Manufacturing Industries and Construction	6		0.00005	0.00002	0.00531	0.00027	0.00013							
3 Transport	105		0.02752	0.00090	0.93572	10.84079	2.03476							
4 Other Sectors	33		0.04790	0.00059	0.04585	1.14284	0.06061							
5 Other (please specify)	3		0.00014	0.00002	0.02298	0.00000	0.00575							
B Fugitive Emissions from Fuels	0		0.00000		0.00000	0.00000	0.00000	0.00000						
1 Solid Fuels			0.00000											
2 Oil and Natural Gas			0.00000		0.00000	0.00000	0.00000	0.00000						
2 Industrial Processes	**0**	**0**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**1.96207**	**0.00000**	**0**	**1.33630**	**0**	**0**	**0**	**0**
A Mineral Products	0					0.00000	1.70873	0.00000						
B Chemical Industry	0		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000						
C Metal Production	0		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0.00000	0	0	0	0
D Other Production	0				0.00000	0.00000	0.25334	0.00000						
E Production of Halocarbons and Sulphur Hexafluoride									0	0.00000	0	0	0	0
F Consumption of Halocarbons and Sulphur Hexafluoride									0	0.10672	0	0	0	0
G Other (please specify)	0		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000				0		0

P = Potential emissions based on Tier 1 Approach. A = Actual emissions based on Tier 2 Approach.

TABLE 7A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES
(Sheet 2 of 3)

SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)														
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 Emissions	CO_2 Removals	CH_4	N_2O	NO_x	CO	NMVOC	SO_2	HFCs		PFCs		SF_6	
									P	A	P	A	P	A
3 Solvent and Other Product Use	**0.00000**			**0.00000**			**0.000000**							
4 Agriculture			**0.49095**	**0.04777**	**0.00000**	**0.00000**								
A Enteric Fermentation			0.44497											
B Manure Management			0.04518	0.00000										
C Rice Cultivation			0.00080											
D Agricultural Soils				0.04777										
E Prescribed Burning of Savannas			0.00000	0.00000	0.00000	0.00000								
F Field Burning of Agricultural Residues			0.00000	0.00000	0.00000	0.00000								
G Other (please specify)			0.00000	0.00000										
5 Land-Use Change & Forestry	**(1) 0.00000**	**(1) -352**	**0.29700**	**0.00204**	**0.07380**	**2.59875**								
A Changes in Forest and Other Woody Biomass Stocks	(1) 0.00000	(1) -516												
B Forest and Grassland Conversion	68.06250		0.29700	0.00204	0.07380	2.59875								
C Abandonment of Managed Lands		0												
D CO_2 Emissions and Removals from Soil	(1) 95.89268	(1) 0												
E Other (please specify)	0.00000	0	0.00000	0.00000	0.00000	0.00000								
6 Waste			**27.79905**	**0.01794**	**0.00000**	**0.00000**	**0.000000**	**0**						
A Solid Waste Disposal on Land			27.79905											
B Wastewater Handling			0.00000	0.01794										
C Waste Incineration														
D Other (please specify)			0.00000	0.00000										
7 Other (please specify)														

(1) The formula does not provide a total estimate of both CO_2 emissions and CO_2 removals. It estimates "net" emissions of CO_2 and places a single number in either the CO_2 emissions or CO_2 removals column, as appropriate. Please note that for the purposes of reporting, the signs for uptake are always (-) and for emissions (+).

TABLE 7A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES
(Sheet 3 of 3)

SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)																
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 Emissions	CO_2 Removals	CH_4	N_2O	NO_x	CO	NMVOC	SO_2	HFCs		PFCs		SF_6	
									P	A	P	A	P	A
Memo Items														
International Bunkers	**68**		**0**	**0**	**0**	**0**	**0**	**0**						
Aviation	61		0	0	0	0	0	0						
Marine	7		0	0	0	0	0	0						
CO_2 Emissions from Biomass	**19**													

TABLE 7B SHORT SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES

(Sheet 1 of 1)

SHORT SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (Gg)														
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 Emissions	CO_2 Removals	CH_4	N_2O	NO_x	CO	NMVOC	SO_2	HFCs		PFCs		SF_6	
									P	A	P	A	P	A
Total National Emissions and Removals	**268.246**	**-352**	**28.66757**	**0.07026**	**1.41322**	**14.60736**	**4.07157**	**0**	**0.10672**	**1.33630**	**0**	**0**	**0**	**0**
1 Energy Reference Approach[1]	**265.950**													
Sectoral Approach[1]	**268.246**		**0.08056**	**0.00251**	**1.33942**	**12.00861**	**2.10949**	**0**						
A Fuel Combustion	268.246		0.08056	0.00251	1.33942	12.00861	2.10949							
B Fugitive Emissions from Fuels	0.000		0.00000		0.00000	0.00000	0.00000	0						
2 Industrial Processes	**0.000**		**0.00000**	**0.00000**	**0.00000**	**0.00000**	**1.96207**	**0**	**0.10672**	**1.33630**	**0**	**0**	**0**	**0**
3 Solvent and Other Product Use	**0.000**			**0.00000**			**0.00000**							
4 Agriculture			**0.49095**	**0.04777**	**0.00000**	**0.00000**								
5 Land-Use Change & Forestry	**(2) 0.000**	**(2) -352**	**0.29700**	**0.00204**	**0.07380**	**2.59875**								
6 Waste			**27.79905**	**0.01794**										
7 Other (please specify)	**0.000**	**0**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0**						
Memo Items:														
International Bunkers	**67.789**		**0.00478**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0**						
Aviation	60.827		0.00430	0.00000	0.00000	0.00000	0.00000	0						
Marine	6.962		0.00049	0.00000	0.00000	0.00000	0.00000	0						
CO_2 Emissions from Biomass	**18.956**													

P = Potential emissions based on Tier 1 Approach. A = Actual emissions based on Tier 2 Approach.

(1) For verification purposes, countries are asked to report the results of their calculations using the Reference Approach and explain any differences with the Sectoral Approach. Do not include the results of both the Reference Approach and the Sectoral Approach in national totals.

(2) The formula does not provide a total estimate of both CO_2 emissions and CO_2 removals. It estimates "net" emissions of CO_2 and places a single number in either the CO_2 emissions

or CO_2 removals column, as appropriate. Please note that for the purposes of reporting, the signs for uptake are always (-) and for emissions (+).

(Sheet 1 of 3)

OVERVIEW TABLE

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2		CH_4		N_2O		NO_x		CO		NMVOC		SO_2	
	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality
Total National Emissions and Removals	**ALL** **ALL**	Quality Quality	**ALL** **ALL**	**H** **H**	**ALL** **ALL**	**H** **H**	**ALL** **ALL**	**H** **H**	**ALL** **ALL**	**H** **H**	**ALL** **ALL**	**H** **H**	**ALL** **ALL**	**H** **H**
1 Energy														
A Fuel Combustion Activities														
Reference Approach	ALL	H												
Sectoral Approach	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H
1 Energy Industries	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H
2 Manufacturing Industries and Construction	ALL ALL ALL	H H H	ALL ALL ALL	H H H	ALL ALL ALL	H H H	ALL ALL ALL	H H H	ALL ALL ALL	H H H	ALL ALL ALL	H H H	ALL ALL ALL	H H H
3 Transport	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H
4 Other Sectors	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H
5 Other (please specify)	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H
B Fugitive Emissions from Fuels	NE	-	NE	-	NE	-	NE	-	NE	-	NE	-	NE	-
1 Solid Fuels	NO	-	NO	-	NO	-	NO	-	NO	-	NO	-	NO	-
2 Oil and Natural Gas	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
2 Industrial Processes														
A Mineral Products	PART	M	PART	M	PART	M	PART	M	PART	M	PART	M	PART	M
B Chemical Industry	NO	-	NO	-	NO	-	NO	-	NO	-	NO	-	NO	-
C Metal Production	NO	-	NO	-	NO	-	NO	-	NO	-	NO	-	NO	-
D Other Production	PART	M	PART	M	PART	M	PART	M	PART	M	PART	M	PART	M
E Production of Halocarbons and Sulphur Hexafluoride	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-

(Sheet 1 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs		PFCs		SF_6		Documen-tation	Disaggrega-tion	Footnotes
	Estimate	Quality	Estimate	Quality	Estimate	Quality			
Total National Emissions and Removals	**NE** **NE**	**-** **-**	**NE** **NE**	**-** **-**	**NE** **NE**	**-** **-**	**M** **M**	**1** **1**	**1** **1**
1 Energy									
A Fuel Combustion Activities								2	
Reference Approach								1	
Sectoral Approach	NE	-	NE	-	NE	-	M	2	1
1 Energy Industries	NE	-	NE	-	NE	-	M	3	1
2 Manufacturing Industries and Construction	NE NE NE	- - -	NE NE NE	- - -	NE NE NE	- - -	M M M	3 3 3	1 1 1
3 Transport	NE	-	NE	-	NE	-	M	3	1
4 Other Sectors	NE	-	NE	-	NE	-	M	3	1
5 Other (please specify)	NE	-	NE	-	NE	-	M		1
B Fugitive Emissions from Fuels	NE	-	NE	-	NE	-	M		1 1
1 Solid Fuels	NE	-	NE	-	NE	-	M		1
2 Oil and Natural Gas	NE	-	NE	-	NE	-	M		1
2 Industrial Processes								**2**	**1**
A Mineral Products	NE	-	NE	-	NE	-	M	3	1
B Chemical Industry	NE	-	NE	-	NE	-	M	3	1
C Metal Production	NE	-	NE	-	NE	-	M	3	1
D Other Production	NE	-	NE	-	NE	-	M	3	1
E Production of Halocarbons and Sulphur Hexafluoride	NE	-	NE	-	NE	-	M	3	1

(Sheet 2 of 3)

	OVERVIEW TABLE													
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2		CH_4		N_2O		NO_x		CO		NMVOC		SO_2	
	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality
Industrial Processes (cont...)														
F Consumption of Halocarbons and Sulphur Hexafluoride														
Potential (1)	PART	M	PART	M	PART	M	PART	M	PART	M	PART	M	PART	M
Actual (2)	PART	M	PART	M	PART	M	PART	M	PART	M	PART	M	PART	M
G Other (please specify)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
3 Solvent and Other Product Use	NE	-	NE	-	NE	-	NE	-	NE	-	NE	-	NE	-
4 Agriculture	PART													
A Enteric Fermentation	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H	ALL	H
B Manure Management	PART	L	PART	L	PART	L	PART	L	PART	L	PART	L	PART	L
C Rice Cultivation	NO	-	NO	-	NO	-	NO	-	NO	-	NO	-	NO	-
D Agricultural Soils	NE	-	NE	-	NE	-	NE	-	NE	-	NE	-	NE	-
E Prescribed Burning of Savannas	NO	-	NO	-	NO	-	NO	-	NO	-	NO	-	NO	-
F Field Burning of Agricultural Residues	PART	M	PART	M	PART	M	PART	M	PART	M	PART	M	PART	M
G Other (please specify)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
5 Land-Use Change & Forestry	PART													
A Changes in Forest and Other Woody Biomass Stocks	ALL	L	ALL	L	ALL	L	ALL	L	ALL	L	ALL	L	ALL	L
B Forest and Grassland Conversion	PART	L	PART	L	PART	L	PART	L	PART	L	PART	L	PART	L

(1) Potential emissions based on Tier 1 Approach.

(2) Actual emissions based on Tier 2 Approach.

(Sheet 2 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs		PFCs		SF_6		Documen-tation	Disaggre-gation	Footnotes
	Estimate	Quality	Estimate	Quality	Estimate	Quality			
Industrial Processes (cont...)									
F Consumption of Halocarbons and Sulphur Hexafluoride									
Potential (1)	PART	M	PART	M	PART	M	L	3	1
Actual (2)	PART	M	PART	M	PART	M	L	3	1
G Other (please specify)	NA	-	NA	-	NA	-	NA	NA	NA
3 Solvent and Other Product Use	NE	-	NE	-	NE	-	NA	NA	NA
4 Agriculture							L	2	1
A Enteric Fermentation	NE	-	NE	-	NE	-	L	3	1
B Manure Management	NE	-	NE	-	NE	-	L	3	1
C Rice Cultivation	NE	-	NE	-	NE	-	NA	NA	NA
D Agricultural Soils	Ne	-	Ne	-	Ne	-	NA	NA	NA
E Prescribed Burning of Savannas	NE	-	NE	-	NE	-	NA	NA	NA
F Field Burning of Agricultural Residues	PART	M -	PART	M -	PART	M -	L	3	1
G Other (please specify)	NA	-	NA	-	NA	-	NA	NA	NA
5 Land-Use Change & Forestry							L	2	1
A Changes in Forest and Other Woody Biomass Stocks	NE	-	NE	-	NE	-	L	3	1
B Forest and Grassland Conversion	NE	-	NE	-	NE	-	L	3	1

(1) Potential emissions based on Ti

(2) Actual emissions based on Tier :

(Sheet 3 of 3)

OVERVIEW TABLE														
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2		CH_4		N_2O		NO_x		CO		NMVOC		SO_2	
	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality	Estimate	Quality
5 Land-Use Change & Forestry (cont....)														
C Abandonment of Managed Lands	PART	-	PART	L	PART	L	PART	L	PART	L	PART	L	PART	L
D CO_2 Emissions and Removals from Soil	NE	-	NE	-	NE	-	NE	-	NE	-	NE	-	NE	-
Other (please specify)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
6 Waste	NA	-	PART	L	PART	L	NA	-	NA	-	NA	-	NA	-
A Solid Waste Disposal on Land	NA	-	PART	L -	PART	-	NA	-	NA	-	NA	-	NA	-
B Wastewater Handling	NA	-	NE	-	NE	-	NA	-	NA	-	NA	-	NA	-
C Waste Incineration	NA	-	NE	-	NE	-	NA	-	NA	-	NA	-	NA	-
D Other (please specify)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
7 Other (please specify)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Memo Items:	PART	L	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
International Bunkers	PART	M	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Aviation	ALL	H	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Marine	NE	L	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
CO_2 Emissions from Biomass	ALL	M												

(Sheet 3 of 3)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs		PFCs		SF_6		Documen-tation	Disaggre-gation	Footnotes
	Estimate	Quality	Estimate	Quality	Estimate	Quality			
5 Land-Use Change & Forestry (cont....)									
C Abandonment of Managed Lands	PART	L	PART	L	PART	L	1	3	1
D CO_2 Emissions and Removals from Soil	NE	-	NE	-	NE	-	1	3	1
Other (please specify)	NA	-	NA	-	NA	-	1	3	1
6 Waste	NA	-	NA	-	NA	-	1	3	1
A Solid Waste Disposal on Land	NA	-	NA	-	NA	-	1	3	1
B Wastewater Handling	NA	-	NA	-	NA	-	1	3	1
C Waste Incineration	NA	-	NA	-	NA	-	1	3	1
D Other (please specify)	NA	-	NA	-	NA	-	1	3	1
7 Other (please specify)	NA	-	NA	-	NA	-	1	3	1
Memo Items:	NA	-	NA	-	NA	-	1	3	1
International Bunkers	NA	-	NA	-	NA	-	1	3	1
Aviation	NA	-	NA	-	NA	-	1	3	1
Marine	NA	-	NA	-	NA	-	1	3	1
CO_2 Emissions from Biomass									

This spreadsheet contains sheet 1 of Worksheet 1-1, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM ENERGY SOURCES (REFERENCE APPROACH)**
WORKSHEET	**1-1**
SHEETS	**1 OF 5**
COUNTRY	**St. Lucia**
YEAR	**1994**

			STEP 1					
			A Production	B Imports	C Exports	D International Bunkers	E Stock Change	F Apparent Consumption
FUEL TYPES								F=(A+B -C-D-E)
Liquid Fossil	Primary Fuels	Crude Oil						0.00000
		Orimulsion						0.00000
		Natural Gas Liquids						0.00000
	Secondary Fuels	Gasoline		0.03603538		0.00091749	0.00221308	0.03290
		Jet Kerosene		0.01895863		0.02053173	-0.0015731	0.00000
		Other Kerosene		0.00293763			0.00236541	0.00057
		Shale Oil						0.00000
		Gas / Diesel Oil		0.05435075		0.00140409	0.00187933	0.05107
		Residual Fuel Oil		0.00129048			-0.00000011	0.00129
		LPG		0.00552925			0.0019778	0.00355
		Ethane						0.00000
		Naphtha						0.00000
		Bitumen		0.00061604			0.00041011	0.00021
		Lubricants		0.00129866		0.0000071	0.0000738	0.00122
		Petroleum Coke						0.00000
		Refinery Feedstocks						0.00000
		Other Oil (Spraytex)		0.00287917			0.0017064	0.00117
Liquid Fossil Totals								

This spreadsheet contains sheet 1 of Worksheet 1-1, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM ENERGY SOURCES (REFERENCE APPROACH)**
WORKSHEET	**1-1**
SHEETS	**1 OF 5**
COUNTRY	**St. Lucia**
YEAR	**1994**

			STEP 1					
			A Production	B Imports	C Exports	D International Bunkers	E Stock Change	F Apparent Consumption
FUEL TYPES								F=(A+B -C-D-E)
Solid Fossil	Primary Fuels	Anthracite [a]						0.00000
		Coking Coal						0.00000
		Other Bit. Coal						0.00000
		Sub-bit. Coal						0.00000
		Lignite						0.00000
		Oil Shale						0.00000
		Peat						0.00000
	Secondary Fuels	BKB & Patent Fuel						0.00000
		Coke Oven/Gas Coke						0.00000
Solid Fuel Totals								
Gaseous Fossil		Natural Gas (Dry)						0.00000
Total								
Biomass total								
		Solid Biomass	0.00443365				0	0.00443
		Liquid Biomass						0.00000
		Gas Biomass						0.00000

(a) If anthracite is not separately available, include with Other Bituminous Coal.

This spreadsheet contains sheet 2 of Worksheet 1-1, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE			ENERGY				
SUBMODULE			CO_2 FROM ENERGY SOURCES (REFERENCE APPROACH)				
WORKSHEET			1-1				
SHEETS			2 OF 5				
COUNTRY			St. Lucia				
YEAR			1994				
			STEP 2		STEP 3		
			G [b] Conversion Factor (TJ/Unit)	H Apparent Consumption (TJ)	I Carbon Emission Factor (t C/TJ)	J Carbon Content (t C)	K Carbon Content (Gg C)
FUEL TYPES				H=(FxG)		J=(HxI)	K=(J/1000)
Liquid Fossil	Primary Fuels	Crude Oil		0.00		0.00	0.00
		Orimulsion		0.00		0.00	0.00
		Natural Gas Liquids		0.00		0.00	0.00
	Secondary Fuels	Gasoline	41868	1,377.66	18.9	26,037.75	26.04
		Jet Kerosene	41868	0.00	19.5	0.00	0.00
		Other Kerosene	41868	23.96	19.6	469.57	0.47
		Shale Oil		0.00		0.00	0.00
		Gas / Diesel Oil	41868	2,138.09	20.2	43,189.35	43.19
		Residual Fuel Oil	41868	54.03	21.1	1,140.13	1.14
		LPG	41868	148.69	17.2	2,557.50	2.56
		Ethane		0.00		0.00	0.00
		Naphtha		0.00		0.00	0.00
		Bitumen	41868	8.62	22	189.68	0.19
		Lubricants	41868	50.99	20	1,019.70	1.02
		Petroleum Coke		0.00		0.00	0.00
		Refinery Feedstocks		0.00		0.00	0.00
		Other Oil (Spraytex)	41868	49.10	20	982.03	0.98
Liquid Fossil Totals			41868	3,851.14		75,585.72	75.59

This spreadsheet contains sheet 2 of Worksheet 1-1, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM ENERGY SOURCES (REFERENCE APPROACH)**
WORKSHEET	**1-1**
SHEETS	**2 OF 5**
COUNTRY	**St. Lucia**
YEAR	**1994**

			STEP 2		**STEP 3**		
			G [b] Conversion Factor (TJ/Unit)	H Apparent Consumption (TJ)	I Carbon Emission Factor (t C/TJ)	J Carbon Content (t C)	K Carbon Content (Gg C)
FUEL TYPES				H=(FxG)		J=(HxI)	K=(J/1000)
Solid Fossil	Primary Fuels	Anthracite [a]		0.00		0.00	0.00
		Coking Coal		0.00		0.00	0.00
		Other Bit. Coal		0.00		0.00	0.00
		Sub-bit. Coal		0.00		0.00	0.00
		Lignite		0.00		0.00	0.00
		Oil Shale		0.00		0.00	0.00
		Peat		0.00		0.00	0.00
	Secondary Fuels	BKB & Patent Fuel		0.00		0.00	0.00
		Coke Oven/Gas Coke		0.00		0.00	0.00
Solid Fuel Totals				0.00		0.00	0.00
Gaseous Fossil		Natural Gas (Dry)		0.00		0.00	0.00
Total				**3,851.14**		**75,585.72**	**75.59**
Biomass total			41868	185.63		5,550.28	5.55
		Solid Biomass	41868	185.63	29.9	5,550.28	5.55
		Liquid Biomass		0.00		0.00	0.00
		Gas Biomass		0.00		0.00	0.00

(a) If anthracite is not separately available, include with Other Bituminous Coal.

(b) Please specify units.

This spreadsheet contains sheet 3 of Worksheet 1-1, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM ENERGY SOURCES (REFERENCE APPROACH)**
WORKSHEET	**1-1**
SHEETS	**3 OF 5**
COUNTRY	**St. Lucia**
YEAR	**1994**

			STEP 4		**STEP 5**		**STEP 6**
			L	M	N	O	P
			Carbon Stored (Gg C)	Net Carbon Emissions (Gg C)	Fraction of Carbon Oxidised	Actual Carbon Emissions (Gg C)	Actual CO_2 Emissions (Gg CO_2)
FUEL TYPES				M=(K-L)		O=(MxN)	P=(Ox[44/12])
Liquid Fossil	Primary Fuels	Crude Oil		0.00		0.00	0.00
		Orimulsion		0.00		0.00	0.00
		Natural Gas Liquids		0.00		0.00	0.00
	Secondary Fuels	Gasoline		26.04	0.99	25.78	94.52
		Jet Kerosene		0.00	0.99	0.00	0.00
		Other Kerosene		0.47	0.99	0.46	1.70
		Shale Oil		0.00		0.00	0.00
		Gas / Diesel Oil	0.00	43.19	0.99	42.76	156.78
		Residual Fuel Oil		1.14	0.99	1.13	4.14
		LPG	0.00	2.56	0.99	2.53	9.28
		Ethane	0.00	0.00		0.00	0.00
		Naphtha	0.00	0.00		0.00	0.00
		Bitumen	0.57	-0.38	0.99	-0.37	-1.37
		Lubricants	0.54	0.48	0.99	0.47	1.73
		Petroleum Coke		0.00		0.00	0.00
		Refinery Feedstocks		0.00		0.00	0.00
		Other Oil (Spraytex)	1.21	-0.23	0.99	-0.23	-0.83
Liquid Fossil Totals			2.32	73.26		72.53	265.95

This spreadsheet contains sheet 3 of Worksheet 1-1, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM ENERGY SOURCES (REFERENCE APPROACH)**
WORKSHEET	**1-1**
SHEETS	**3 OF 5**
COUNTRY	**St. Lucia**
YEAR	**1994**

			STEP 4		**STEP 5**		**STEP 6**
			L Carbon Stored (Gg C)	M Net Carbon Emissions (Gg C)	N Fraction of Carbon Oxidised	O Actual Carbon Emissions (Gg C)	P Actual CO_2 Emissions (Gg CO_2)
FUEL TYPES				M=(K-L)		O=(MxN)	P=(Ox[44/12])
Solid Fossil	Primary Fuels	Anthracite [a]		0.00		0.00	0.00
		Coking Coal	0.00	0.00		0.00	0.00
		Other Bit. Coal		0.00		0.00	0.00
		Sub-bit. Coal		0.00		0.00	0.00
		Lignite		0.00		0.00	0.00
		Oil Shale		0.00		0.00	0.00
		Peat		0.00		0.00	0.00
	Secondary Fuels	BKB & Patent Fuel		0.00		0.00	0.00
		Coke Oven/Gas Coke		0.00		0.00	0.00
Solid Fuel Totals			0.00	0.00		0.00	0.00
Gaseous Fossil		Natural Gas (Dry)	0.00	0.00		0.00	0.00
Total			**2.32**	**73.26**		**72.53**	**265.95**
Biomass total			0.00	5.55		5.44	19.94
		Solid Biomass		5.55	0.98	5.44	19.94
		Liquid Biomass		0.00		0.00	0.00
		Gas Biomass		0.00		0.00	0.00

(a) If anthracite is not separately available, include with Other Bituminous Coal.

This spreadsheet contains sheet 4 of Worksheet 1-1, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

	MODULE	**ENERGY**					
	SUBMODULE	**CO_2 FROM ENERGY SOURCES (REFERENCE APPROACH)**					
	WORKSHEET	**1-1**					
	SHEETS	**4 OF 5 EMISSIONS FROM INTERNATIONAL BUNKERS (INTERNATIONAL MARINE AND AIR TRANSPORT)**					
	COUNTRY	**St. Lucia**					
	YEAR	**1994.00000**					
		STEP 1	**STEP 2**		**STEP 3**		
		A Quantities Delivered[a]	B Conversion Factor (TJ/Unit)	C Quantities Delivered (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
FUEL TYPES				C=(AxB)		E=(CxD)	F=(E/1000)
Solid Fossil	Other Bituminous Coal	0.00000	0.00	0.00	0.00	0.00	0.00
	Sub-Bituminous Coal	0.00000	0.00	0.00	0.00	0.00	0.00
Liquid Fossil	Gasoline	0.00092	41,868.00	38.41	18.90	726.01	0.73
	Jet Kerosene	0.02053	41,868.00	859.62	19.50	16,762.64	16.76
	Gas / Diesel Oil	0.00140	41,868.00	58.79	20.20	1,187.49	1.19
	Residual Fuel Oil	0.00000	41,868.00	0.00	21.10	0.00	0.00
	Lubricants	0.00001	41,868.00	0.30	20.00	5.95	0.01
			Total	**957.12**			

(a) Quantities taken from column "International Bunkers" from Worksheet 1-1, Sheet 1 of 5.

This spreadsheet contains sheet 5 of Worksheet 1-1, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

	MODULE	**ENERGY**					
	SUBMODULE	**CO_2 FROM ENERGY SOURCES (REFERENCE APPROACH)**					
	WORKSHEET	**1-1**					
	SHEETS	**5 OF 5 EMISSIONS FROM INTERNATIONAL BUNKERS (INTERNATIONAL MARINE AND AIR TRANSPORT)**					
	COUNTRY	St. Lucia					
	YEAR	1994					
		STEP 4			**STEP 5**		**STEP 6**
		G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
FUEL TYPES			H=(FxG)	I=(F-H)		K=(IxJ)	L=(Kx[44/12])
Solid Fossil	Other Bituminous Coal		0.00	0.00		0.00	0.00
	Sub-Bituminous Coal		0.00	0.00		0.00	0.00
Liquid Fossil	Gasoline		0.00	0.73	0.99	0.72	2.64
	Jet Kerosene		0.00	16.76	0.99	16.60	60.85
	Gas / Diesel Oil		0.00	1.19		0.00	0.00
	Residual Fuel Oil		0.00	0.00		0.00	0.00
	Lubricants		0.00	0.01	0.99	0.01	0.02
						Total[(a)]	**63.51**

(a) The bunkers emissions are not to be added to national totals.

This spreadsheet contains Auxiliary Worksheet 1-1, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM ENERGY**
WORKSHEET	**AUXILIARY WORKSHEET 1-1: ESTIMATING CARBON STORED IN PRODUCTS.**
SHEETS	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

	A Estimated Fuel Quantities	B Conversion Factor (TJ/Unit)	C Estimated Fuel Quantities (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)	G Fraction of Carbon Stored	H Carbon Stored (Gg C)
FUEL TYPES			C=(AxB)		E=(CxD)	F=(E/1000)		H=(FxG)
Naphtha [a]			0.00		0.00	0.00	0.8	0.00
Lubricants	0.00129866	41868	54.37	20	1,087.45	1.09	0.5	0.54
Bitumen	0.00061604	41868	25.79	22	567.43	0.57	1	0.57
Coal Oils and Tars (from Coking Coal)			0.00		0.00	0.00	0.75	0.00
Natural Gas [a]			0.00		0.00	0.00	0.33	0.00
Gas/Diesel Oil [a]			0.00		0.00	0.00	0.5	0.00
LPG [a]			0.00		0.00	0.00	0.8	0.00
Ethane [a]			0.00		0.00	0.00	0.8	0.00
Other F(Spraytx)[b]	0.00287917	41868	120.55	20	2,410.90	2.41	0.5	1.21
			0.00		0.00	0.00		0.00
			0.00		0.00	0.00		0.00

(a) Enter these fuels when they are used as feedstocks.
(b) Use the Other Fuels rows to enter any other products in which carbon may be stored.

This spreadsheet contains sheet 1 of Worksheet 1-2, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**1 OF 16 ENERGY INDUSTRIES**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 1	**STEP 2**		**STEP 3**		
ENERGY INDUSTRIES	A Consumption	B Conversion Factor (TJ/Unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E/1000)
Crude Oil [(a)]			0.00		0.00	0.00
Natural Gas Liquids			0.00		0.00	0.00
Gasoline			0.00		0.00	0.00
Jet Kerosene			0.00		0.00	0.00
Other Kerosene			0.00		0.00	0.00
Gas/Diesel Oil	0.039357017	41868	1,647.80	20.2	33,285.55	33.29
Residual Fuel Oil			0.00		0.00	0.00
LPG			0.00		0.00	0.00
Ethane			0.00		0.00	0.00
Naphtha			0.00		0.00	0.00
Lubricants			0.00		0.00	0.00
Petroleum Coke			0.00		0.00	0.00
Refinery Gas			0.00		0.00	0.00
Anthracite			0.00		0.00	0.00
Coking Coal			0.00		0.00	0.00
Other Bituminous Coal			0.00		0.00	0.00
Sub-Bituminous Coal			0.00		0.00	0.00
Lignite			0.00		0.00	0.00
Peat			0.00		0.00	0.00
Patent Fuel			0.00		0.00	0.00
Brown Coal Briquettes			0.00		0.00	0.00
Coke Oven Coke			0.00		0.00	0.00
Gas Coke			0.00		0.00	0.00
Gas Works Gas			0.00		0.00	0.00
Coke Oven Gas			0.00		0.00	0.00
Blast Furnace Gas			0.00		0.00	0.00
Natural gas			0.00		0.00	0.00
Municipal Solid Waste			0.00		0.00	0.00
Industrial Waste			0.00		0.00	0.00
			0.00		0.00	0.00
			0.00		0.00	0.00
		Total	**1,647.80**			
Memo items:						
Wood/Wood Waste			0.00		0.00	0.00
Charcoal			0.00		0.00	0.00
Other Solid Biomass			0.00		0.00	0.00
Liquid Biomass			0.00		0.00	0.00

This spreadsheet contains sheet 1 of Worksheet 1-2, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**
SHEETS	**1 OF 16 ENERGY INDUSTRIES**
COUNTRY	**St. Lucia**
YEAR	**1994**

	STEP 1	**STEP 2**		**STEP 3**		
ENERGY INDUSTRIES	A Consumption	B Conversion Factor (TJ/Unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E/1000)
Gaseous Biomass			0.00		0.00	0.00
		Total Biomass	**0.00**			

(a) Include only consumption of crude that is burned, not crude oil which is refined into petroleum products.

This spreadsheet contains sheet 2 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**2 OF 16 ENERGY INDUSTRIES**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
				STEP 5		**STEP 6**
ENERGY INDUSTRIES	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(Kx[44/12])
Crude Oil [a]		0.00	0.00		0.00	0.00
Natural Gas Liquids		0.00	0.00		0.00	0.00
Gasoline		0.00	0.00		0.00	0.00
Jet Kerosene		0.00	0.00		0.00	0.00
Other Kerosene		0.00	0.00		0.00	0.00
Gas/Diesel Oil	0	0.00	33.29	0.99	32.95	120.83
Residual Fuel Oil		0.00	0.00		0.00	0.00
LPG		0.00	0.00		0.00	0.00
Ethane		0.00	0.00		0.00	0.00
Naphtha		0.00	0.00		0.00	0.00
Lubricants	(b)	0.00	0.00		0.00	0.00
Petroleum Coke		0.00	0.00		0.00	0.00
Refinery Gas		0.00	0.00		0.00	0.00
Anthracite		0.00	0.00		0.00	0.00
Coking Coal		0.00	0.00		0.00	0.00
Other Bituminous Coal		0.00	0.00		0.00	0.00
Sub-Bituminous Coal		0.00	0.00		0.00	0.00
Lignite		0.00	0.00		0.00	0.00
Peat		0.00	0.00		0.00	0.00
Patent Fuel		0.00	0.00		0.00	0.00
Brown Coal Briquettes		0.00	0.00		0.00	0.00
Coke Oven Coke		0.00	0.00		0.00	0.00
Gas Coke		0.00	0.00		0.00	0.00
Gas Works Gas		0.00	0.00		0.00	0.00
Coke Oven Gas		0.00	0.00		0.00	0.00
Blast Furnace Gas		0.00	0.00		0.00	0.00
Natural gas		0.00	0.00		0.00	0.00
Municipal Solid Waste		0.00	0.00		0.00	0.00
Industrial Waste		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
					Total	**120.83**
Memo items:						
Wood/Wood Waste		0.00	0.00		0.00	0.00
Charcoal		0.00	0.00		0.00	0.00
Other Solid Biomass		0.00	0.00		0.00	0.00
Liquid Biomass		0.00	0.00		0.00	0.00

This spreadsheet contains sheet 2 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**2 OF 16 ENERGY INDUSTRIES**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
				STEP 5		**STEP 6**
ENERGY INDUSTRIES	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(Kx[44/12])
Gaseous Biomass		0.00	0.00		0.00	0.00
					Total Biomass	**0.00**

(a) Include only consumption of crude that is burned, not crude oil which is refined into petroleum products.

(b) Use a value of 0.5 for lubricants.

This spreadsheet contains sheet 3 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**
SHEETS	**3 OF 16 MANUFACTURING INDUSTRIES AND CONSTRUCTION**
COUNTRY	**St. Lucia**
YEAR	**1994**

	STEP 1	**STEP 2**		**STEP 3**		
MANUFACTURING INDUSTRIES AND CONSTRUCTION	A Consumption	B Conversion Factor (TJ/Unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E/1000)
Crude Oil [a]			0.00		0.00	0.00
Natural Gas Liquids			0.00		0.00	0.00
Gasoline			0.00		0.00	0.00
Jet Kerosene			0.00		0.00	0.00
Other Kerosene			0.00		0.00	0.00
Gas/Diesel Oil	0.00063435	41868	26.56	20.2	536.49	0.54
Residual Fuel Oil	0.00129059	41868	54.03	21.1	1,140.13	1.14
LPG	0.00001516	41868	0.63	17.2	10.92	0.01
Ethane			0.00		0.00	0.00
Naphtha			0.00		0.00	0.00
Lubricants	0.00012138	41868	5.08	20	101.64	0.10
Petroleum Coke			0.00		0.00	0.00
Refinery Gas			0.00		0.00	0.00
Anthracite			0.00		0.00	0.00
Coking Coal			0.00		0.00	0.00
Other Bituminous Coal			0.00		0.00	0.00
Sub-Bituminous Coal			0.00		0.00	0.00
Lignite			0.00		0.00	0.00
Peat			0.00		0.00	0.00
Patent Fuel			0.00		0.00	0.00
Brown Coal Briquettes			0.00		0.00	0.00
Coke Oven Coke			0.00		0.00	0.00
Gas Coke			0.00		0.00	0.00
Gas Works Gas			0.00		0.00	0.00
Coke Oven Gas			0.00		0.00	0.00
Blast Furnace Gas			0.00		0.00	0.00
Natural gas			0.00		0.00	0.00
Municipal Solid Waste			0.00		0.00	0.00
Industrial Waste			0.00		0.00	0.00
			0.00		0.00	0.00
			0.00		0.00	0.00
		Total	**86.31**			
Memo items:						
Wood/Wood Waste			0.00		0.00	0.00
Charcoal			0.00		0.00	0.00
Other Solid Biomass			0.00		0.00	0.00
Liquid Biomass			0.00		0.00	0.00
Gaseous Biomass			0.00		0.00	0.00

This spreadsheet contains sheet 3 of Worksheet 1-2, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**3 OF 16 MANUFACTURING INDUSTRIES AND CONSTRUCTION**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 1	**STEP 2**		**STEP 3**		
MANUFACTURING INDUSTRIES AND CONSTRUCTION	A Consumption	B Conversion Factor (TJ/Unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E/1000)
		Total Biomass	**0.00**			

Note: to separately identify emissions associated with autogeneration from those associated with process heat, copy sheets 3 and 4, clearly indicating the source of the emissions.

This spreadsheet contains sheet 4 of Worksheet 1-2, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**4 OF 16 MANUFACTURING INDUSTRIES AND CONSTRUCTION**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 4			**STEP 5**		**STEP 6**
MANUFACTURING INDUSTRIES AND CONSTRUCTION	G Fraction of Carbon Stored[a]	H Carbon Stored (Gg C)[a]	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(Kx[44/12])
Crude Oil [a]		0.00	0.00		0.00	0.00
Natural Gas Liquids		0.00	0.00		0.00	0.00
Gasoline		0.00	0.00		0.00	0.00
Jet Kerosene		0.00	0.00		0.00	0.00
Other Kerosene		0.00	0.00		0.00	0.00
Gas/Diesel Oil	0	(b) 0.00	0.54	0.99	0.53	1.95
Residual Fuel Oil	0	0.00	1.14	0.99	1.13	4.14
LPG	0	(b) 0.00	0.01	0.99	0.01	0.04
Ethane		(b) 0.00	0.00		0.00	0.00
Naphtha		(b) 0.00	0.00		0.00	0.00
Lubricants	(c) 0.5	0.05	0.05	0.99	0.05	0.18
Petroleum Coke		0.00	0.00		0.00	0.00
Refinery Gas		0.00	0.00		0.00	0.00
Anthracite		0.00	0.00		0.00	0.00
Coking Coal		0.00	0.00		0.00	0.00
Other Bituminous Coal		0.00	0.00		0.00	0.00
Sub-Bituminous Coal		0.00	0.00		0.00	0.00
Lignite		0.00	0.00		0.00	0.00
Peat		0.00	0.00		0.00	0.00
Patent Fuel		0.00	0.00		0.00	0.00
Brown Coal Briquettes		0.00	0.00		0.00	0.00
Coke Oven Coke		0.00	0.00		0.00	0.00
Gas Coke		0.00	0.00		0.00	0.00
Gas Works Gas		0.00	0.00		0.00	0.00
Coke Oven Gas		0.00	0.00		0.00	0.00
Blast Furnace Gas		0.00	0.00		0.00	0.00
Natural gas		(b) 0.00	0.00		0.00	0.00
Municipal Solid Waste		0.00	0.00		0.00	0.00
Industrial Waste		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
					Total	**6.31**
Memo items:						
Wood/Wood Waste		0.00	0.00		0.00	0.00
Charcoal		0.00	0.00		0.00	0.00
Other Solid Biomass		0.00	0.00		0.00	0.00
Liquid Biomass		0.00	0.00		0.00	0.00
Gaseous Biomass		0.00	0.00		0.00	0.00

This spreadsheet contains sheet 4 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**4 OF 16 MANUFACTURING INDUSTRIES AND CONSTRUCTION**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 4			**STEP 5**		**STEP 6**
MANUFACTURING INDUSTRIES AND CONSTRUCTION	G Fraction of Carbon Stored[(a)]	H Carbon Stored (Gg C)[(a)]	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(Kx[44/12])
					Total Biomass	**0.00**

(a) For naphtha, natural gas, gas/diesel oil, LPG and any other fuels used as feedstocks, do not fill out Column G. Complete Column H, using Auxiliary Worksheet 1-2.
(b) Use Auxiliary Worksheet 1-2 to fill out the cells for these products.
(c) Use a value of 0.5 for lubricants.

This spreadsheet contains Auxiliary Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**AUXILIARY WORKSHEET 1-2: ESTIMATING CARBON STORED IN PRODUCTS**
SHEETS	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

	A Feedstock Use	B Conversion Factor (TJ/Unit)	C Feedstock Use (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)	G Fraction of Carbon Stored	H Carbon Stored (Gg C)
FUEL TYPES			C=(AxB)		E=(CxD)	F=(E/1000)		H=(FxG)
Gas/Diesel Oil			0.00		0.00	0.00	0.5	0.00
LPG			0.00		0.00	0.00	0.8	0.00
Ethane			0.00		0.00	0.00	0.8	0.00
Naphtha			0.00		0.00	0.00	0.8	0.00
Natural Gas			0.00		0.00	0.00	0.33	0.00
Other Fuels [(a)]			0.00		0.00	0.00		0.00
			0.00		0.00	0.00		0.00
			0.00		0.00	0.00		0.00

(a) Please specify. Enter the results of this calculation in Worksheet 1-2 Step by Step Calculation, Sheet 4, in the cells marked with (b).

This spreadsheet contains sheet 5 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	ENERGY					
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)					
WORKSHEET	1-2 STEP BY STEP CALCULATIONS					
SHEETS	5 OF 16 TRANSPORT					
COUNTRY	St. Lucia					
YEAR	1994					
	STEP 1	STEP 2		STEP 3		
TRANSPORT	A Consumption	B Conversion Factor (TJ/Unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E/1000)
Domestic Aviation [a]						
Gasoline			0.00		0.00	0.00
Jet Kerosene			0.00		0.00	0.00
			0.00		0.00	0.00
		Subtotal	**0.00**			
Road Transport						
Natural Gas			0.00		0.00	0.00
LPG			0.00		0.00	0.00
Gasoline	0.03186083	41868	1,333.95	18.9	25,211.64	25.21
Gas/Diesel Oil	0.00404104	41868	169.19	20.2	3,417.64	3.42
			0.00		0.00	0.00
		Subtotal	**1,503.14**			
Rail Transport						
Gas/Diesel Oil			0.00		0.00	0.00
Residual Fuel Oil			0.00		0.00	0.00
Anthracite			0.00		0.00	0.00
Other Bituminous Coal			0.00		0.00	0.00
Coke Oven Coke			0.00		0.00	0.00
			0.00		0.00	0.00
		Subtotal	**0.00**			
National Navigation [a]						
Gasoline			0.00		0.00	0.00
Gas/Diesel Oil			0.00		0.00	0.00
Residual Fuel Oil			0.00		0.00	0.00
Lubricants	0.00048231	41868	20.19	20	403.87	0.40
Sub-Bituminous Coal			0.00		0.00	0.00
			0.00		0.00	0.00
		Subtotal	**20.19**			
Pipeline Transport						
Natural Gas			0.00		0.00	0.00
			0.00		0.00	0.00
			0.00		0.00	0.00
		Subtotal	**0.00**			
		Total Transport [a]	**1,523.33**			
Memo items:						
Liquid Biomass			0.00		0.00	0.00
			0.00		0.00	0.00
		Total Biomass	**0.00**			

(a) Excluding international bunkers.

This spreadsheet contains sheet 6 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**6 OF 16 TRANSPORT**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 4			**STEP 5**		**STEP 6**
TRANSPORT	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(Kx[44/12])
Domestic Aviation [(a)]						
Gasoline		0.00	0.00		0.00	0.00
Jet Kerosene		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
					Subtotal	**0.00**
Road Transport						
Natural Gas		0.00	0.00		0.00	0.00
LPG		0.00	0.00		0.00	0.00
Gasoline		0.00	25.21	0.99	24.96	91.52
Gas/Diesel Oil		0.00	3.42	0.99	3.38	12.41
		0.00	0.00		0.00	0.00
					Subtotal	**103.92**
Rail Transport						
Gas/Diesel Oil		0.00	0.00		0.00	0.00
Residual Fuel Oil		0.00	0.00		0.00	0.00
Anthracite		0.00	0.00		0.00	0.00
Other Bituminous Coal		0.00	0.00		0.00	0.00
Coke Oven Coke		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
					Subtotal	**0.00**
National Navigation [(a)]						
Gasoline		0.00	0.00		0.00	0.00
Gas/Diesel Oil		0.00	0.00		0.00	0.00
Residual Fuel Oil		0.00	0.00		0.00	0.00
Lubricants	(b) 0.5	0.20	0.20	0.99	0.20	0.73
Sub-Bituminous Coal		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
					Subtotal	**0.73**
Pipeline Transport						
Natural Gas		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
					Subtotal	**0.00**
					Total Transport [(a)]	**104.66**
Memo items:						
Liquid Biomass		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
					Total Biomass	**0.00**

(a) Excluding international bunkers.
(b) Use a value of 0.5 for lubricants.

This spreadsheet contains sheet 9 of Worksheet 1-2, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**9 OF 16 COMMERCIAL / INSTITUTIONAL SECTOR**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 1	**STEP 2**		**STEP 3**		
COMMERCIAL / INSTITUTIONAL SECTOR	A Consumption	B Conversion Factor (TJ/Unit)	C Consumption (TJ)	D Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E/1000)
Gasoline	0.00073902	41868	30.94	18.9	584.79	0.58
Jet Kerosene			0.00		0.00	0.00
Other Kerosene	0.00011218	41868	4.70	19.6	92.06	0.09
Gas/Diesel Oil	0.0063335	41868	265.17	20.2	5,356.45	5.36
Residual Fuel Oil			0.00		0.00	0.00
LPG	0.00210102	41868	87.97	17.2	1,513.01	1.51
Anthracite			0.00		0.00	0.00
Other Bituminous Coal			0.00		0.00	0.00
Lignite			0.00		0.00	0.00
Brown Coal Briquettes			0.00		0.00	0.00
Coke Oven Coke			0.00		0.00	0.00
Gas Works Gas			0.00		0.00	0.00
Coke Oven Gas			0.00		0.00	0.00
Natural gas			0.00		0.00	0.00
Lubricants	0.00061213	41868	25.63	20	512.57	0.51
Bitumen	0.00020593	41868	8.62	22	189.68	0.19
		Total	**423.03**			
Memo items:						
Wood/Wood Waste			0.00		0.00	0.00
Charcoal			0.00		0.00	0.00
Other Solid Biomass			0.00		0.00	0.00
Liquid Biomass			0.00		0.00	0.00
Gaseous Biomass			0.00		0.00	0.00
		Total Biomass	**0.00**			

Note: to separately identify emissions associated with autogeneration from those associated with process heat, copy sheets 9 and 10, clearly indicating the source of the emissions.

This spreadsheet contains sheet 10 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**10 OF 16 COMMERCIAL / INSTITUTIONAL SECTOR**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 4			**STEP 5**		**STEP 6**
COMMERCIAL / INSTITUTIONAL SECTOR	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(Kx[44/12])
Gasoline		0.00	0.58	0.99	0.58	2.12
Jet Kerosene		0.00	0.00		0.00	0.00
Other Kerosene		0.00	0.09	0.99	0.09	0.33
Gas/Diesel Oil		0.00	5.36	0.99	5.30	19.44
Residual Fuel Oil		0.00	0.00		0.00	0.00
LPG		0.00	1.51	0.99	1.50	5.49
Anthracite		0.00	0.00		0.00	0.00
Other Bituminous Coal		0.00	0.00		0.00	0.00
Lignite		0.00	0.00		0.00	0.00
Brown Coal Briquettes		0.00	0.00		0.00	0.00
Coke Oven Coke		0.00	0.00		0.00	0.00
Gas Works Gas		0.00	0.00		0.00	0.00
Coke Oven Gas		0.00	0.00		0.00	0.00
Natural gas		0.00	0.00		0.00	0.00
Lubricants	0.5	0.26	0.26	0.99	0.25	0.93
Bitumen	1	0.19	0.00	0.99	0.00	0.00
					Total	**28.32**
Memo items:						
Wood/Wood Waste		0.00	0.00		0.00	0.00
Charcoal		0.00	0.00		0.00	0.00
Other Solid Biomass		0.00	0.00		0.00	0.00
Liquid Biomass		0.00	0.00		0.00	0.00
Gaseous Biomass		0.00	0.00		0.00	0.00
					Total Biomass	**0.00**

Note: to separately identify emissions associated with autogeneration from those associated with process heat, copy sheets 9 and 10, clearly indicating the source of the emissions.

This spreadsheet contains sheet 7 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**7 OF 16 MEMO ITEMS: INTERNATIONAL BUNKERS**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 1	**STEP 2**		**STEP 3**		
MEMO ITEMS: INTERNATIONAL BUNKERS	A Consumption	B Conversion Factor (TJ/Unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E/1000)
Intl. Marine Bunkers						
Gasoline	0.00091749	41868	38.41	18.9	726.01	0.73
Gas/Diesel Oil	0.00140409	41868	58.79	20.2	1,187.49	1.19
Residual Fuel Oil			0.00		0.00	0.00
Lubricants	0.0000071	41868	0.30	20	5.95	0.01
Sub-Bituminous Coal			0.00		0.00	0.00
LPG	0.00000209	41868	0.09	17.2	1.51	0.00
		Total	**97.58**			
Intl. Aviation Bunkers						
Gasoline	0.000235	41868	9.84	18.9	185.96	0.19
Jet Kerosene	0.02029673	41868	849.78	19.5	16,570.78	16.57
			0.00		0.00	0.00
		Total	**859.62**			

Note: Emissions of International Bunkers are excluded from national totals and are
reported for informational purposes only.

This spreadsheet contains sheet 8 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	ENERGY					
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)					
WORKSHEET	1-2 STEP BY STEP CALCULATIONS					
SHEETS	8 OF 16 MEMO ITEMS: INTERNATIONAL BUNKERS					
COUNTRY	St. Lucia					
YEAR	1994					
	STEP 4			STEP 5		STEP 6
MEMO ITEMS: INTERNATIONAL BUNKERS	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(Kx[44/12])
Intl. Marine Bunkers						
Gasoline		0.00	0.73	0.99	0.72	2.64
Gas/Diesel Oil		0.00	1.19	0.99	1.18	4.31
Residual Fuel Oil		0.00	0.00		0.00	0.00
Lubricants	(a) 0.5	0.00	0.00	0.99	0.00	0.01
Sub-Bituminous Coal		0.00	0.00		0.00	0.00
LPG		0.00	0.00	0.99	0.00	0.01
					Total	**6.96**
Intl. Aviation Bunkers						
Gasoline		0.00	0.19	0.99	0.18	0.68
Jet Kerosene		0.00	16.57	0.99	16.41	60.15
		0.00	0.00		0.00	0.00
					Total	**60.83**

(a) Use a value of 0.5 for lubricants.
Note: Emissions of International Bunkers are excluded from national totals and are reported
for informational purposes only.

This spreadsheet contains sheet 11 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**11 OF 16 RESIDENTIAL SECTOR**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 1	**STEP 2**		**STEP 3**		
RESIDENTIAL SECTOR	A Consumption	B Conversion Factor (TJ/Unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E/1000)
Gasoline			0.00		0.00	0.00
Other Kerosene	0.00045053	41868	18.86	19.6	369.71	0.37
Gas/Diesel Oil			0.00		0.00	0.00
Residual Fuel Oil			0.00		0.00	0.00
LPG	0.00141441	41868	59.22	17.2	1,018.56	1.02
Anthracite			0.00		0.00	0.00
Other Bituminous Coal			0.00		0.00	0.00
Sub-Bituminous Coal			0.00		0.00	0.00
Lignite			0.00		0.00	0.00
Peat			0.00		0.00	0.00
Patent Fuel			0.00		0.00	0.00
Brown Coal Briquettes			0.00		0.00	0.00
Coke Oven Coke			0.00		0.00	0.00
Gas Works Gas			0.00		0.00	0.00
Coke Oven Gas			0.00		0.00	0.00
Natural gas			0.00		0.00	0.00
Lubricants	0.00000017	41868	0.01	20	0.14	0.00
			0.00		0.00	0.00
			0.00		0.00	0.00
			0.00		0.00	0.00
		Total	**78.09**			
Memo items:						
Wood/Wood Waste	0.00135358	41868	56.67	29.9	1,694.48	1.69
Charcoal	0.00249439	41868	104.44	29.9	3,122.61	3.12
Other Solid Biomass	0.00029284	41868	12.26	29.9	366.59	0.37
Liquid Biomass			0.00		0.00	0.00
Gaseous Biomass			0.00		0.00	0.00
		Total Biomass	**173.37**			

This spreadsheet contains sheet 12 of Worksheet 1-2, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	ENERGY					
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)					
WORKSHEET	1-2 STEP BY STEP CALCULATIONS					
SHEETS	12 OF 16 RESIDENTIAL SECTOR					
COUNTRY	St. Lucia					
YEAR	1994					
	STEP 4			STEP 5		STEP 6
RESIDENTIAL SECTOR	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(Kx[44/12])
Gasoline		0.00	0.00		0.00	0.00
Other Kerosene		0.00	0.37	0.99	0.37	1.34
Gas/Diesel Oil		0.00	0.00		0.00	0.00
Residual Fuel Oil		0.00	0.00		0.00	0.00
LPG		0.00	1.02	0.99	1.01	3.70
Anthracite		0.00	0.00		0.00	0.00
Other Bituminous Coal		0.00	0.00		0.00	0.00
Sub-Bituminous Coal		0.00	0.00		0.00	0.00
Lignite		0.00	0.00		0.00	0.00
Peat		0.00	0.00		0.00	0.00
Patent Fuel		0.00	0.00		0.00	0.00
Brown Coal Briquettes		0.00	0.00		0.00	0.00
Coke Oven Coke		0.00	0.00		0.00	0.00
Gas Works Gas		0.00	0.00		0.00	0.00
Coke Oven Gas		0.00	0.00		0.00	0.00
Natural gas		0.00	0.00		0.00	0.00
Lubricants	0.5	0.00	0.00	0.99	0.00	0.00
		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
					Total	**5.04**
Memo items:						
Wood/Wood Waste		0.00	1.69	0.98	1.66	6.09
Charcoal		0.00	3.12	0.98	3.06	11.22
Other Solid Biomass		0.00	0.37	0.98	0.36	1.32
Liquid Biomass		0.00	0.00		0.00	0.00
Gaseous Biomass		0.00	0.00		0.00	0.00
					Total Biomass	**18.63**

This spreadsheet contains sheets 13 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**13 OF 16 AGRICULTURE / FORESTRY / FISHING**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 1	**STEP 2**		**STEP 3**		
AGRICULTURE / FORESTRY / FISHING	A Consumption	B Conversion Factor (TJ/Unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E/1000)
Mobile						
Gasoline	0.00002269	41868	0.95	18.9	17.95	0.02
Jet Kerosene			0.00		0.00	0.00
Other Kerosene			0.00		0.00	0.00
Gas/Diesel Oil	0.00001526	41868	0.64	20.2	12.91	0.01
Residual Fuel Oil			0.00		0.00	0.00
LPG			0.00		0.00	0.00
Lubricants	0.00000177	41868	0.07	20	1.48	0.00
Spraytex	0.00117277	41868	49.10	20	982.03	0.98
		Total Mobile	**50.76**			
Stationary						
Gasoline			0.00		0.00	0.00
Other Kerosene			0.00		0.00	0.00
Gas/Diesel Oil			0.00		0.00	0.00
Residual Fuel Oil			0.00		0.00	0.00
LPG			0.00		0.00	0.00
Anthracite			0.00		0.00	0.00
Coking Coal			0.00		0.00	0.00
Other Bituminous Coal			0.00		0.00	0.00
Lignite			0.00		0.00	0.00
Patent Fuel			0.00		0.00	0.00
Brown Coal Briquettes			0.00		0.00	0.00
Coke Oven Coke			0.00		0.00	0.00
Gas Works Gas			0.00		0.00	0.00
Natural gas			0.00		0.00	0.00
			0.00		0.00	0.00
			0.00		0.00	0.00
		Total Stationary	**0.00**			
Memo items:						
Mobile						
Liquid Biomass			0.00		0.00	0.00
Stationary						
Wood/Wood Waste			0.00		0.00	0.00
Charcoal			0.00		0.00	0.00
Other Solid Biomass	0.00029284	41868	12.26	29.9	366.59	0.37
Liquid Biomass			0.00		0.00	0.00
Gaseous Biomass			0.00		0.00	0.00
		Total Biomass	**12.26**			

Note: to separately identify emissions associated with autogeneration from those associated
with process heat, copy sheets 13 and 14, clearly indicating the source of the emissions.

This spreadsheet contains sheets 14 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**					
SHEETS	**14 OF 16 AGRICULTURE / FORESTRY / FISHING**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 4			**STEP 5**		**STEP 6**
AGRICULTURE / FORESTRY / FISHING	G Fraction of Carbon Stored [(a)]	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(Kx[44/12])
Mobile						
Gasoline		0.00	0.02	0.99	0.02	0.07
Jet Kerosene		0.00	0.00		0.00	0.00
Other Kerosene		0.00	0.00		0.00	0.00
Gas/Diesel Oil		0.00	0.01	0.99	0.01	0.05
Residual Fuel Oil		0.00	0.00		0.00	0.00
LPG		0.00	0.00		0.00	0.00
Lubricants	0.5	0.00	0.00	0.99	0.00	0.00
Spraytex	1	0.98	0.00	0.99	0.00	0.00
					Total Mobile	**0.11**
Stationary						
Gasoline		0.00	0.00		0.00	0.00
Other Kerosene		0.00	0.00		0.00	0.00
Gas/Diesel Oil		0.00	0.00		0.00	0.00
Residual Fuel Oil		0.00	0.00		0.00	0.00
LPG		0.00	0.00		0.00	0.00
Anthracite		0.00	0.00		0.00	0.00
Coking Coal		0.00	0.00		0.00	0.00
Other Bituminous Coal		0.00	0.00		0.00	0.00
Lignite		0.00	0.00		0.00	0.00
Patent Fuel		0.00	0.00		0.00	0.00
Brown Coal Briquettes		0.00	0.00		0.00	0.00
Coke Oven Coke		0.00	0.00		0.00	0.00
Gas Works Gas		0.00	0.00		0.00	0.00
Natural gas		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
					Total Stationary	**0.00**
Memo items:						
Mobile						
Liquid Biomass		0.00	0.00		0.00	0.00
Stationary						
Wood/Wood Waste		0.00	0.00		0.00	0.00
Charcoal		0.00	0.00		0.00	0.00
Other Solid Biomass	0.75	0.27	0.09	0.98	0.09	0.33
Liquid Biomass		0.00	0.00		0.00	0.00
Gaseous Biomass		0.00	0.00		0.00	0.00
					Total Biomass	**0.33**

Note: to separately identify emissions associated with autogeneration from those associated with process heat, copy sheets 13 and 14, clearly indicating the source of the emissions.
(a) Use a value of 0.5 for lubricants.

This spreadsheet contains sheets 15 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	ENERGY					
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)					
WORKSHEET	1-2 STEP BY STEP CALCULATIONS					
SHEETS	15 OF 16 OTHER (NOT ELSEWHERE SPECIFIED)					
COUNTRY	St. Lucia					
YEAR	1994.00000					
	STEP 1	STEP 2		STEP 3		
OTHER (NOT ELSEWHERE SPECIFIED)	A Consumption	B Conversion Factor (TJ/Unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E/1000)
Crude Oil	(a)		0.00		0.00	0.00
Natural Gas Liquids			0.00		0.00	0.00
Gasoline	0.00027	41868	11.36	18.9	214.70	0.21
Jet Kerosene			0.00		0.00	0.00
Other Kerosene	0.00001	41868	0.40	19.6	7.80	0.01
Gas/Diesel Oil	0.00069	41868	28.73	20.2	580.31	0.58
Residual Fuel Oil	0.00002	41868	0.79	21.1	16.58	0.02
LPG			0.00		0.00	0.00
Ethane			0.00		0.00	0.00
Naphtha			0.00		0.00	0.00
Lubricants			0.00		0.00	0.00
Petroleum Coke			0.00		0.00	0.00
Refinery Gas			0.00		0.00	0.00
Anthracite			0.00		0.00	0.00
Coking Coal			0.00		0.00	0.00
Other Bituminous Coal			0.00		0.00	0.00
Sub-Bituminous Coal			0.00		0.00	0.00
Lignite			0.00		0.00	0.00
Peat			0.00		0.00	0.00
Patent Fuel			0.00		0.00	0.00
Brown Coal Briquettes			0.00		0.00	0.00
Coke Oven Coke			0.00		0.00	0.00
Gas Coke			0.00		0.00	0.00
Gas Works Gas			0.00		0.00	0.00
Coke Oven Gas			0.00		0.00	0.00
Blast Furnace Gas			0.00		0.00	0.00
Natural gas			0.00		0.00	0.00
Municipal Solid Waste			0.00		0.00	0.00
Industrial Waste			0.00		0.00	0.00
			0.00		0.00	0.00
			0.00		0.00	0.00
			0.00		0.00	0.00
		Total	**41.27**			
Memo items:						
Wood/Wood Waste			0.00		0.00	0.00
Charcoal			0.00		0.00	0.00
Other Solid Biomass			0.00		0.00	0.00
Liquid Biomass			0.00		0.00	0.00
Gaseous Biomass			0.00		0.00	0.00
		Total Biomass	**0.00**			

Note: to separately identify emissions associated with autogeneration from those associated with process heat, copy sheets 15 and 16,clearly indicating the source.
(a) Include only consumption of crude that is burned, not crude oil which is refined into petroleum products.

This spreadsheet contains sheets 16 of Worksheet 1-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-2 STEP BY STEP CALCULATIONS**
SHEETS	**16 OF 16 OTHER (NOT ELSEWHERE SPECIFIED)**
COUNTRY	**St. Lucia**
YEAR	**1994**

	STEP 4			STEP 5		STEP 6
OTHER (NOT ELSEWHERE SPECIFIED)	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(Kx[44/12])
Crude Oil		0.00	0.00		0.00	0.00
Natural Gas Liquids		0.00	0.00		0.00	0.00
Gasoline		0.00	0.21	0.99	0.21	0.78
Jet Kerosene		0.00	0.00		0.00	0.00
Other Kerosene		0.00	0.01	0.99	0.01	0.03
Gas/Diesel Oil		0.00	0.58	0.99	0.57	2.11
Residual Fuel Oil		0.00	0.02	0.99	0.02	0.06
LPG		0.00	0.00		0.00	0.00
Ethane		0.00	0.00		0.00	0.00
Naphtha		0.00	0.00		0.00	0.00
Lubricants	(a)	0.00	0.00		0.00	0.00
Petroleum Coke		0.00	0.00		0.00	0.00
Refinery Gas		0.00	0.00		0.00	0.00
Anthracite		0.00	0.00		0.00	0.00
Coking Coal		0.00	0.00		0.00	0.00
Other Bituminous Coal		0.00	0.00		0.00	0.00
Sub-Bituminous Coal		0.00	0.00		0.00	0.00
Lignite		0.00	0.00		0.00	0.00
Peat		0.00	0.00		0.00	0.00
Patent Fuel		0.00	0.00		0.00	0.00
Brown Coal Briquettes		0.00	0.00		0.00	0.00
Coke Oven Coke		0.00	0.00		0.00	0.00
Gas Coke		0.00	0.00		0.00	0.00
Gas Works Gas		0.00	0.00		0.00	0.00
Coke Oven Gas		0.00	0.00		0.00	0.00
Blast Furnace Gas		0.00	0.00		0.00	0.00
Natural gas		0.00	0.00		0.00	0.00
Municipal Solid Waste		0.00	0.00		0.00	0.00
Industrial Waste		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
		0.00	0.00		0.00	0.00
					Total	**2.97**
Memo items:						
Wood/Wood Waste		0.00	0.00		0.00	0.00
Charcoal		0.00	0.00		0.00	0.00
Other Solid Biomass		0.00	0.00		0.00	0.00
Liquid Biomass		0.00	0.00		0.00	0.00
Gaseous Biomass		0.00	0.00		0.00	0.00
					Total Biomass	**0.00**

Note: to separately identify emissions associated with autogeneration from those associated
with process heat, copy sheets 15 and 16,clearly indicating the source.
(a) Use a value of 0.5 for lubricants.

This spreadsheet contains sheet 1 of Worksheet 1-2 Overview, in accordance with
the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

		MODULE	ENERGY					
		SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)					
		WORKSHEET	1-2 OVERVIEW					
		SHEET	1 OF 8					
		COUNTRY	St. Lucia					
		YEAR	1994					
			A Crude Oil	B Orimulsion	C Natural Gas Liquids	D Gasoline	E Jet Kerosene	F Other Kerosene
FUEL CONSUMPTION (TJ)								
Energy Industries			0.00		0.00	0.00	0.00	0.00
Manufacturing Industries and Construction			0.00		0.00	0.00	0.00	0.00
Transport	Domestic Aviation [(a)]					0.00	0.00	
	Road					1,333.95		
	Railways							
	National Navigation [(a)]					0.00		
	Pipeline Transport							
Other Sectors	Commercial/Institutional					30.94	0.00	4.70
	Residential					0.00		18.86
	Agriculture / Forestry / Fishing	Stationary				0.00		0.00
		Mobile				0.95	0.00	0.00
Other (not elsewhere specified)			0.00		0.00	11.36	0.00	0.40
Total [(a)]			**0.00**	**0.00**	**0.00**	**1,377.20**	**0.00**	**23.96**
Memo: International Marine Bunkers						38.41		
Memo: International Aviation Bunkers						9.84	849.78	
CO_2 EMISSIONS (Gg)								
Energy Industries			0.00		0.00	0.00	0.00	0.00
Manufacturing Industries and Construction			0.00		0.00	0.00	0.00	0.00
Transport	Domestic Aviation [(a)]					0.00	0.00	
	Road					91.52		
	Railways							
	National Navigation [(a)]					0.00		
	Pipeline Transport							
Other Sectors	Commercial/Institutional					2.12	0.00	0.33
	Residential					0.00		1.34
	Agriculture / Forestry / Fishing	Stationary				0.00		0.00
		Mobile				0.07	0.00	0.00
Other (not elsewhere specified)			0.00		0.00	0.78	0.00	0.03
Total [(a)]			**0.00**	**0.00**	**0.00**	**94.49**	**0.00**	**1.70**
Memo: International Marine Bunkers						2.64		
Memo: International Aviation Bunkers						0.68	60.15	

(a) Excludes International Bunkers.

This spreadsheet contains sheet 2 of Worksheet 1-2 Overview, in accordance with
the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

		MODULE	**ENERGY**					
		SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
		WORKSHEET	**1-2 OVERVIEW**					
		SHEET	**2 OF 8**					
		COUNTRY	**St. Lucia**					
		YEAR	**1994**					
			G Shale Oil	H Gas / Diesel Oil	I Residual Fuel Oil	J LPG	K Ethane	L Naphtha
FUEL CONSUMPTION (TJ)								
Energy Industries				1,647.80	0.00	0.00	0.00	0.00
Manufacturing Industries and Construction				26.56	54.03	0.63	0.00	0.00
Transport	Domestic Aviation [(a)]							
	Road			169.19		0.00		
	Railways			0.00	0.00			
	National Navigation [(a)]			0.00	0.00			
	Pipeline Transport							
Other Sectors	Commercial/Institutional			265.17	0.00	87.97		
	Residential			0.00	0.00	59.22		
	Agriculture / Forestry / Fishing	Stationary		0.00	0.00	0.00		
		Mobile		0.64	0.00	0.00		
Other (not elsewhere specified)				28.73	0.79	0.00	0.00	0.00
Total [(a)]			**0.00**	**2,138.09**	**54.82**	**147.82**	**0.00**	**0.00**
Memo: International Marine Bunkers				58.79	0.00			
Memo: International Aviation Bunkers								
CO_2 EMISSIONS (Gg)								
Energy Industries				120.83	0.00	0.00	0.00	0.00
Manufacturing Industries and Construction				1.95	4.14	0.04	0.00	0.00
Transport	Domestic Aviation [(a)]							
	Road			12.41		0.00		
	Railways			0.00	0.00			
	National Navigation [(a)]			0.00	0.00			
	Pipeline Transport							
Other Sectors	Commercial/Institutional			19.44	0.00	5.49		
	Residential			0.00	0.00	3.70		
	Agriculture / Forestry / Fishing	Stationary		0.00	0.00	0.00		
		Mobile		0.05	0.00	0.00		
Other (not elsewhere specified)				2.11	0.06	0.00	0.00	0.00
Total [(a)]			**0.00**	**156.78**	**4.20**	**9.23**	**0.00**	**0.00**
Memo: International Marine Bunkers				4.31	0.00			
Memo: International Aviation Bunkers								

(a) Excludes International Bunkers.

This spreadsheet contains sheet 3 of Worksheet 1-2 Overview, in accordance with
the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE			**ENERGY**					
SUBMODULE			**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET			**1-2 OVERVIEW**					
SHEET			**3 OF 8**					
COUNTRY			**St. Lucia**					
YEAR			**1994**					
			M Lubricants	N Petroleum Coke	O Refinery Gas	P Anthracite	Q Coking Coal	R Other Bituminous Coal
FUEL CONSUMPTION (TJ)								
Energy Industries			0.00	0.00	0.00	0.00	0.00	0.00
Manufacturing Industries and Construction			5.08	0.00	0.00	0.00	0.00	0.00
Transport	Domestic Aviation [a]							
	Road							
	Railways					0.00		0.00
	National Navigation [a]		20.19					
	Pipeline Transport							
Other Sectors	Commercial/Institutional					0.00		0.00
	Residential					0.00		0.00
	Agriculture / Forestry / Fishing	Stationary				0.00	0.00	0.00
		Mobile						
Other (not elsewhere specified)			0.00	0.00	0.00	0.00	0.00	0.00
Total [a]			**25.28**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Memo: International Marine Bunkers			0.30					
Memo: International Aviation Bunkers								
CO_2 EMISSIONS (Gg)								
Energy Industries			0.00	0.00	0.00	0.00	0.00	0.00
Manufacturing Industries and Construction			0.18	0.00	0.00	0.00	0.00	0.00
Transport	Domestic Aviation [a]							
	Road							
	Railways					0.00		0.00
	National Navigation [a]		0.73					
	Pipeline Transport							
Other Sectors	Commercial/Institutional					0.00		0.00
	Residential					0.00		0.00
	Agriculture / Forestry / Fishing	Stationary				0.00	0.00	0.00
		Mobile						
Other (not elsewhere specified)			0.00	0.00	0.00	0.00	0.00	0.00
Total [a]			**0.92**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Memo: International Marine Bunkers			0.01					
Memo: International Aviation Bunkers								

(a) Excludes International Bunkers.

This spreadsheet contains sheet 4 of Worksheet 1-2 Overview, in accordance with
the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE			**ENERGY**					
SUBMODULE			**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**					
WORKSHEET			**1-2 OVERVIEW**					
SHEET			**4 OF 8**					
COUNTRY			**St. Lucia**					
YEAR			**1994**					
[redacted]								
			S Sub-Bituminous Coal	T Lignite	U Oil Shale	V Peat	W Patent Fuel	X Brown Coal Briquettes
FUEL CONSUMPTION (TJ)								
Energy Industries			0.00	0.00		0.00	0.00	0.00
Manufacturing Industries and Construction			0.00	0.00		0.00	0.00	0.00
Transport	Domestic Aviation [(a)]							
	Road							
	Railways							
	National Navigation [(a)]		0.00					
	Pipeline Transport							
Other Sectors	Commercial/Institutional			0.00				0.00
	Residential		0.00	0.00		0.00	0.00	0.00
	Agriculture / Forestry / Fishing	Stationary		0.00			0.00	0.00
		Mobile						
Other (not elsewhere specified)			0.00	0.00		0.00	0.00	0.00
Total [(a)]			**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Memo: International Marine Bunkers			0.00					
Memo: International Aviation Bunkers								
CO_2 EMISSIONS (Gg)								
Energy Industries			0.00	0.00		0.00	0.00	0.00
Manufacturing Industries and Construction			0.00	0.00		0.00	0.00	0.00
Transport	Domestic Aviation [(a)]							
	Road							
	Railways							
	National Navigation [(a)]		0.00					
	Pipeline Transport							
Other Sectors	Commercial/Institutional			0.00				0.00
	Residential		0.00	0.00		0.00	0.00	0.00
	Agriculture / Forestry / Fishing	Stationary		0.00			0.00	0.00
		Mobile						
Other (not elsewhere specified)			0.00	0.00		0.00	0.00	0.00
Total [(a)]			**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Memo: International Marine Bunkers			0.00					
Memo: International Aviation Bunkers								

(a) Excludes International Bunkers.

This spreadsheet contains sheet 5 of Worksheet 1-2 Overview, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-2 OVERVIEW**
SHEET	**5 OF 8**
COUNTRY	**St. Lucia**
YEAR	**1994**

[redacted]

		Y Coke Oven Coke	Z Gas Coke	AA Works Gas	AB Coke Oven Gas	AC Blast Furnace Gas	AD Natural Gas
FUEL CONSUMPTION (TJ)							
Energy Industries		0.00	0.00	0.00	0.00	0.00	0.00
Manufacturing Industries and Construction		0.00	0.00	0.00	0.00	0.00	0.00
Transport	Domestic Aviation [(a)]						
	Road						0.00
	Railways	0.00					
	National Navigation [(a)]						
	Pipeline Transport						0.00
Other Sectors	Commercial/Institutional	0.00		0.00	0.00		0.00
	Residential	0.00		0.00	0.00		0.00
	Agriculture / Forestry / Fishing – Stationary	0.00		0.00			0.00
	Agriculture / Forestry / Fishing – Mobile						
Other (not elsewhere specified)		0.00	0.00	0.00	0.00	0.00	0.00
Total [(a)]		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Memo: International Marine Bunkers							
Memo: International Aviation Bunkers							
CO_2 EMISSIONS (Gg)							
Energy Industries		0.00	0.00	0.00	0.00	0.00	0.00
Manufacturing Industries and Construction		0.00	0.00	0.00	0.00	0.00	0.00
Transport	Domestic Aviation [(a)]						
	Road						0.00
	Railways	0.00					
	National Navigation [(a)]						
	Pipeline Transport						0.00
Other Sectors	Commercial/Institutional	0.00		0.00	0.00		0.00
	Residential	0.00		0.00	0.00		0.00
	Agriculture / Forestry / Fishing – Stationary	0.00		0.00			0.00
	Agriculture / Forestry / Fishing – Mobile						
Other (not elsewhere specified)		0.00	0.00	0.00	0.00	0.00	0.00
Total [(a)]		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Memo: International Marine Bunkers							
Memo: International Aviation Bunkers							

(a) Excludes International Bunkers.

This spreadsheet contains sheet 6 of Worksheet 1-2 Overview, in accordance with
the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-2 OVERVIEW**
SHEET	**6 OF 8**
COUNTRY	**St. Lucia**
YEAR	**1994**

			AE Municipal Solid Waste	AF Industrial Waste	AG [b] (additional fuels)	AH[b]	AI[b]	AJ[b]
FUEL CONSUMPTION (TJ)								
Energy Industries			0.00	0.00	0.00	0.00		
Manufacturing Industries and Construction			0.00	0.00	0.00	0.00		
Transport	Domestic Aviation [a]				0.00			
	Road				0.00			
	Railways				0.00			
	National Navigation [a]				0.00			
	Pipeline Transport				0.00	0.00		
Other Sectors	Commercial/Institutional				25.63	8.62		
	Residential				0.01	0.00	0.00	0.00
	Agriculture / Forestry / Fishing	Stationary			0.00	0.00		
		Mobile			0.07	49.10		
Other (not elsewhere specified)			0.00	0.00	0.00	0.00	0.00	
Total [a]			**0.00**	**0.00**	**25.71**	**57.72**	**0.00**	**0.00**
Memo: International Marine Bunkers					0.09			
Memo: International Aviation Bunkers					0.00			
CO_2 EMISSIONS (Gg)								
Energy Industries			0.00	0.00	0.00	0.00		
Manufacturing Industries and Construction			0.00	0.00	0.00	0.00		
Transport	Domestic Aviation [a]				0.00			
	Road				0.00			
	Railways				0.00			
	National Navigation [a]				0.00			
	Pipeline Transport				0.00	0.00		
Other Sectors	Commercial/Institutional				0.93	0.00		
	Residential				0.00	0.00	0.00	0.00
	Agriculture / Forestry / Fishing	Stationary			0.00	0.00		
		Mobile			0.00	0.00		
Other (not elsewhere specified)			0.00	0.00	0.00	0.00	0.00	
Total [a]			**0.00**	**0.00**	**0.93**	**0.00**	**0.00**	**0.00**
Memo: International Marine Bunkers					0.01			
Memo: International Aviation Bunkers					0.00			

(a) Excludes International Bunkers.

(b) Other Fuels should be linked to Step by Step Calculations where applicable.

This spreadsheet contains sheet 7 of Worksheet 1-2 Overview, in accordance with
the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-2 OVERVIEW**
SHEET	**7 OF 8**
COUNTRY	**St. Lucia**
YEAR	**1994**

			AK[b]	AL Total Liquid Fossil [c]	AM Total Solid Fossil [c]	AN Total Gaseous Fossil [c]	AO Total Other Fuels [c]	AP Total [d]
FUEL CONSUMPTION (TJ)								
Energy Industries				1,647.80	0.00	0.00	0.00	1,647.80
Manufacturing Industries and Construction				86.31	0.00	0.00	0.00	86.31
Transport	Domestic Aviation [a]			0.00	0.00		0.00	0.00
	Road			1,503.14	0.00	0.00	0.00	1,503.14
	Railways			0.00	0.00		0.00	0.00
	National Navigation [a]			20.19	0.00		0.00	20.19
	Pipeline Transport			0.00	0.00	0.00	0.00	0.00
Other Sectors	Commercial/Institutional			388.77	0.00	0.00	34.25	423.03
	Residential			78.08	0.00	0.00	0.01	78.09
	Agriculture / Forestry / Fishing	Stationary		0.00	0.00	0.00	0.00	0.00
		Mobile		1.59	0.00		49.18	50.76
Other (not elsewhere specified)				41.27	0.00	0.00	0.00	41.27
Total [a]			**0.00**	**3,767.16**	**0.00**	**0.00**	**83.43**	**3,850.59**
Memo: International Marine Bunkers				97.50	0.00			97.58
Memo: International Aviation Bunkers				859.62	0.00			859.62
CO_2 EMISSIONS (Gg)								
Energy Industries				120.83	0.00	0.00	0.00	120.83
Manufacturing Industries and Construction				6.31	0.00	0.00	0.00	6.31
Transport	Domestic Aviation [a]			0.00	0.00		0.00	0.00
	Road			103.92	0.00	0.00	0.00	103.92
	Railways			0.00	0.00		0.00	0.00
	National Navigation [a]			0.73	0.00		0.00	0.73
	Pipeline Transport			0.00	0.00	0.00	0.00	0.00
Other Sectors	Commercial/Institutional			27.39	0.00	0.00	0.93	28.32
	Residential			5.04	0.00	0.00	0.00	5.04
	Agriculture / Forestry / Fishing	Stationary		0.00	0.00	0.00	0.00	0.00
		Mobile		0.11	0.00		0.00	0.11
Other (not elsewhere specified)				2.97	0.00	0.00	0.00	2.97
Total [a]			**0.00**	**267.31**	**0.00**	**0.00**	**0.93**	**268.25**
Memo: International Marine Bunkers				6.96	0.00			6.96
Memo: International Aviation Bunkers				60.83	0.00			60.83

(a) Excludes International Bunkers.
(b) Other Fuels should be linked to Step by Step Calculations where applicable.
(c) Please include Fuels from columns AG to AK where applicable.
(d) Excluding Biomass.

This spreadsheet contains sheet 8 of Worksheet 1-2 Overview, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-2 OVERVIEW**
SHEET	**8 OF 8**
COUNTRY	**St. Lucia**
YEAR	**1994**

			AQ Wood / Wood Waste	AR Charcoal	AS Other Solid Biomass	AT Liquid Biomass	AU Gaseous Biomass	AV Total Biomass
FUEL CONSUMPTION (TJ)								
Energy Industries			0.00	0.00	0.00	0.00	0.00	0.00
Manufacturing Industries and Construction			0.00	0.00	0.00	0.00	0.00	0.00
Transport	Domestic Aviation [a]							0.00
	Road					(b) 0.00		0.00
	Railways							0.00
	National Navigation [a]							0.00
	Pipeline Transport							
Other Sectors	Commercial/Institutional		0.00	0.00	0.00	0.00	0.00	0.00
	Residential		56.67	104.44	12.26	0.00	0.00	173.37
	Agriculture / Forestry / Fishing	Stationary	0.00	0.00	12.26	0.00	0.00	12.26
		Mobile				0.00		0.00
Other (not elsewhere specified)			0.00	0.00	0.00	0.00	0.00	0.00
Total [a]			**56.67**	**104.44**	**24.52**	**0.00**	**0.00**	**185.63**
Memo: International Marine Bunkers								0.00
Memo: International Aviation Bunkers								0.00
CO_2 EMISSIONS (Gg)								
Energy Industries			0.00	0.00	0.00	0.00	0.00	0.00
Manufacturing Industries and Construction			0.00	0.00	0.00	0.00	0.00	0.00
Transport	Domestic Aviation [a]							0.00
	Road					(b) 0.00		0.00
	Railways							0.00
	National Navigation [a]							0.00
	Pipeline Transport							
Other Sectors	Commercial/Institutional		0.00	0.00	0.00	0.00	0.00	0.00
	Residential		6.09	11.22	1.32	0.00	0.00	18.63
	Agriculture / Forestry / Fishing	Stationary	0.00	0.00	0.33	0.00	0.00	0.33
		Mobile				0.00		0.00
Other (not elsewhere specified)			0.00	0.00	0.00	0.00	0.00	0.00
Total [a]			**6.09**	**11.22**	**1.65**	**0.00**	**0.00**	**18.96**
Memo: International Marine Bunkers								0.00
Memo: International Aviation Bunkers								0.00

(a) Excludes International Bunkers.

(b) Provisionally linked to Road Transport. Change if not applicable.

This spreadsheet contains sheet 1 of Worksheet 1-3, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**NON-CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-3**
SHEETS	**1 OF 3**
COUNTRY	**St. Lucia**
YEAR	**1994**

			STEP 1						
			A Fuel Consumption (TJ)						
ACTIVITY			A1 Coal	A2 Natural Gas	A3 Oil		A4 Wood / Wood Waste	A5 Charcoal	A6 Other Biomass and Wastes
Energy Industries						1647.8			
Manufacturing Industries and Construction						26.56			
Transport	Domestic Aviation [a]								
	Road				Gasoline	Diesel			
					1333.95	169.19			
	Railways								
	National Navigation [a]				20.19				
Other Sectors	Commercial/Institutional				30.94	265.17			
	Residential				78.09		56.67168744	104.418792	24.52125024
	Agriculture / Forestry / Fishing	Stationary							
		Mobile			0.95	0.64			
Other (not elsewhere specified)					11.36	28.73			
Total [a]			**0.00**	**0.00**		**1,965.77**	**56.67**	**104.42**	**24.52**
Memo: International Marine Bunkers					38.41	58.79			
Memo: International Aviation Bunkers					9.84	849.78			

(a) Excludes international bunkers.

This spreadsheet contains sheets 2 of Worksheet 1-3 (CH_4), in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**NON-CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-3**
SHEETS	**2 OF 3 CH_4**
COUNTRY	**St. Lucia**
YEAR	**1994**

			STEP 2						
			B **Emission Factors (kg/TJ)**						
			B1	B2	B3		B4	B5	B6
ACTIVITY			Coal	Natural Gas	Oil		Wood / Wood Waste	Charcoal	Other Biomass and Wastes
Energy Industries						3			
Manufacturing Industries and Construction						2			
Transport	Domestic Aviation [a]								
	Road				Gasoline	Diesel			
					20	5			
	Railways								
	National Navigation [a]				5	5			
Other Sectors	Commercial/Institutional				10	10			
	Residential				10	10	300	200	300
	Agriculture / Forestry / Fishing	Stationary							
		Mobile			5	5			
Other (not elsewhere specified)					5	5			
Total [a]									
Memo: International Marine Bunkers					5	5			
Memo: International Aviation Bunkers					5	5			

(a) Excludes international bunkers.

This spreadsheet contains sheets 3 of Worksheet 1-3 (CH_4), in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**NON-CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-3**
SHEETS	**3 OF 3 CH_4**
COUNTRY	**St. Lucia**
YEAR	**1994**

			STEP 3							
			C							**D**
			Emissions by Fuel (kg)							**Total Emissions (Gg)**
			C=(AxB)							
			C1	C2	C3		C4	C5	C6	D= sum (C1..C6) / 1 000 000
ACTIVITY			Coal	Natural Gas	Oil		Wood / Wood Waste	Charcoal	Other Biomass and Wastes	
Energy Industries			0.00	0.00		4,943.40	0.00	0.00	0.00	0.00
Manufacturing Industries and Construction			0.00	0.00		53.12	0.00	0.00	0.00	0.00
Transport	Domestic Aviation [a]					0.00				0.00
					Gasoline	Diesel				
	Road			0.00	26,679.00	845.95				0.03
	Railways		0.00			0.00				0.00
	National Navigation [a]		0.00			0.00				0.00
Other Sectors	Commercial/Institutional		0.00	0.00		2,651.70	0.00	0.00	0.00	0.00
	Residential		0.00	0.00		0.00	17,001.51	20,883.76	7,356.38	0.05
	Agriculture / Forestry / Fishing	Stationary	0.00	0.00		0.00	0.00	0.00	0.00	0.00
		Mobile		0.00		3.20				0.00
Other (not elsewhere specified)			0.00	0.00		143.65	0.00	0.00	0.00	0.00
Total [a]			**0.00**	**0.00**		**35,320.02**	**17,001.51**	**20,883.76**	**7,356.38**	**0.08**
Memo: International Marine Bunkers			0.00		192.05	293.95				0.00
Memo: International Aviation Bunkers					49.20	4,248.90				0.00

(a) Excludes international bunkers.

This spreadsheet contains sheets 2 of Worksheet 1-3 (N_2O), in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**NON-CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-3**
SHEETS	**2 OF 3 N_2O**
COUNTRY	**St. Lucia**
YEAR	**1994**

<table>
<tr><th colspan="3" rowspan="3">ACTIVITY</th><th colspan="7">STEP 2
B
Emission Factors (kg/TJ)</th></tr>
<tr><th>B1</th><th>B2</th><th colspan="2">B3</th><th>B4</th><th>B5</th><th>B6</th></tr>
<tr><th>Coal</th><th>Natural Gas</th><th colspan="2">Oil</th><th>Wood / Wood Waste</th><th>Charcoal</th><th>Other Biomass and Wastes</th></tr>
<tr><td colspan="3">Energy Industries</td><td></td><td></td><td colspan="2">0.6</td><td></td><td></td><td></td></tr>
<tr><td colspan="3">Manufacturing Industries and Construction</td><td></td><td></td><td></td><td>0.6</td><td></td><td></td><td></td></tr>
<tr><td rowspan="4">Transport</td><td colspan="2">Domestic Aviation[a]</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Road</td><td></td><td></td><td>Gasoline
0.6</td><td>Diesel
0.6</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Railways</td><td></td><td></td><td colspan="2"></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">National Navigation[a]</td><td></td><td></td><td>0.6</td><td>0.6</td><td></td><td></td><td></td></tr>
<tr><td rowspan="4">Other Sectors</td><td colspan="2">Commercial/Institutional</td><td></td><td></td><td>0.6</td><td>0.6</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Residential</td><td></td><td></td><td>0.6</td><td>0.6</td><td>4</td><td>1</td><td>4</td></tr>
<tr><td rowspan="2">Agriculture / Forestry / Fishing</td><td>Stationary</td><td></td><td></td><td colspan="2"></td><td></td><td></td><td></td></tr>
<tr><td>Mobile</td><td></td><td></td><td>0.6</td><td>0.6</td><td></td><td></td><td></td></tr>
<tr><td colspan="3">Other (not elsewhere specified)</td><td></td><td></td><td>0.6</td><td>0.6</td><td></td><td></td><td></td></tr>
<tr><td colspan="3">Total [a]</td><td></td><td></td><td colspan="2"></td><td></td><td></td><td></td></tr>
<tr><td colspan="3">Memo: International Marine Bunkers</td><td></td><td></td><td colspan="2"></td><td></td><td></td><td></td></tr>
<tr><td colspan="3">Memo: International Aviation Bunkers</td><td></td><td></td><td colspan="2"></td><td></td><td></td><td></td></tr>
</table>

(a) Excludes international bunkers.

This spreadsheet contains sheets 3 of Worksheet 1-3 (N_2O), in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**NON-CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-3**
SHEETS	**3 OF 3 N_2O**
COUNTRY	**St. Lucia**
YEAR	**1994**

			STEP 3							
			C							**D**
			Emissions by Fuel (kg)							**Total Emissions (Gg)**
			C=(AxB)							
			C1	C2	C3		C4	C5	C6	D= sum
ACTIVITY			Coal	Natural Gas	Oil		Wood / Wood Waste	Charcoal	Other Biomass and Wastes	(C1..C6) / 1 000 000
Energy Industries			0.00	0.00		988.68	0.00	0.00	0.00	0.00
Manufacturing Industries and Construction			0.00	0.00		15.94	0.00	0.00	0.00	0.00
Transport	Domestic Aviation[a]					0.00				0.00
	Road				Gasoline	Diesel				
				0.00	800.37	101.51				0.00
	Railways		0.00			0.00				0.00
	National Navigation[a]		0.00			0.00				0.00
Other Sectors	Commercial/Institutional		0.00	0.00		159.10	0.00	0.00	0.00	0.00
	Residential		0.00	0.00		0.00	226.69	104.42	98.09	0.00
	Agriculture / Forestry / Fishing	Stationary	0.00	0.00		0.00	0.00	0.00	0.00	0.00
		Mobile		0.00		0.38				0.00
Other (not elsewhere specified)			0.00	0.00		17.24	0.00	0.00	0.00	0.00
Total [a]			**0.00**	**0.00**		**2,083.22**	**226.69**	**104.42**	**98.09**	**0.00**
Memo: International Marine Bunkers			0.00		0.00	0.00				0.00
Memo: International Aviation Bunkers					0.00	0.00				0.00

(a) Excludes international bunkers.

This spreadsheet contains sheets 2 of Worksheet 1-3 (NO_X), in accordance with the

Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**	
SUBMODULE	**NON-CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**	
WORKSHEET	**1-3**	
SHEETS	**2 OF 3 NO_X**	
COUNTRY	**St. Lucia**	
YEAR	**1994**	

ACTIVITY			**STEP 2** B Emission Factors (kg/TJ) B1 Coal	B2 Natural Gas	B3 Oil		B4 Wood / Wood Waste	B5 Charcoal	B6 Other Biomass and Wastes
Energy Industries						200			
Manufacturing Industries and Construction						200			
Transport	Domestic Aviation [a]								
	Road				Gasoline 600	Diesel 800			
	Railways								
	National Navigation [a]				1500	1500			
Other Sectors	Commercial/Institutional				100	100			
	Residential				100	100	100	100	100
	Agriculture / Forestry / Fishing	Stationary							
		Mobile			1200	1200			
Other (not elsewhere specified)					800	800			
Total [a]									
Memo: International Marine Bunkers									
Memo: International Aviation Bunkers									

(a) Excludes international bunkers.

This spreadsheet contains sheets 3 of Worksheet 1-3 (NO_X), in accordance with the

Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**NON-CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-3**
SHEETS	**3 OF 3 NO_X**
COUNTRY	**St. Lucia**
YEAR	**1994**

			STEP 3							
			C **Emissions by Fuel (kg)**							**D** **Total Emissions (Gg)**
			C=(AxB)							
			C1	C2	C3		C4	C5	C6	D= sum (C1..C6) / 1 000 000
ACTIVITY			Coal	Natural Gas	Oil		Wood / Wood Waste	Charcoal	Other Biomass and Wastes	
Energy Industries			0.00	0.00		329,560.00	0.00	0.00	0.00	0.33
Manufacturing Industries and Construction			0.00	0.00		5,312.00	0.00	0.00	0.00	0.01
Transport	Domestic Aviation[a]					0.00				0.00
					Gasoline	Diesel				
	Road			0.00	800,370.00	135,352.00				0.94
	Railways		0.00			0.00				0.00
	National Navigation[a]		0.00			0.00				0.00
Other Sectors	Commercial/Institutional		0.00	0.00		26,517.00	0.00	0.00	0.00	0.03
	Residential		0.00	0.00		0.00	5,667.17	10,441.88	2,452.13	0.02
	Agriculture / Forestry / Fishing	Stationary	0.00	0.00		0.00	0.00	0.00	0.00	0.00
		Mobile		0.00		768.00				0.00
Other (not elsewhere specified)			0.00	0.00		22,984.00	0.00	0.00	0.00	0.02
Total [a]			**0.00**	**0.00**		**1,320,863.00**	**5,667.17**	**10,441.88**	**2,452.13**	**1.34**
Memo: International Marine Bunkers			0.00		0.00	0.00				0.00
Memo: International Aviation Bunkers					0.00	0.00				0.00

(a) Excludes international bunkers.

This spreadsheet contains sheets 2 of Worksheet 1-3 (CO), in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**NON-CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-3**
SHEETS	**2 OF 3 CO**
COUNTRY	**St. Lucia**
YEAR	**1994**

ACTIVITY			**STEP 2** **B** **Emission Factors (kg/TJ)**						
			B1 Coal	B2 Natural Gas	B3 Oil		B4 Wood / Wood Waste	B5 Charcoal	B6 Other Biomass and Wastes
Energy Industries						15			
Manufacturing Industries and Construction						10			
Transport	Domestic Aviation[a]								
	Road				Gasoline	Diesel			
					8000	1000			
	Railways								
	National Navigation[a]				1000	1000			
Other Sectors	Commercial/Institutional				20	20			
	Residential				20	20	5000	7000	5000
	Agriculture / Forestry / Fishing	Stationary							
		Mobile			1000	1000			
Other (not elsewhere specified)									
Total [a]									
Memo: International Marine Bunkers									
Memo: International Aviation Bunkers									

(a) Excludes international bunkers.

This spreadsheet contains sheets 3 of Worksheet 1-3 (CO), in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**NON-CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-3**
SHEETS	**3 OF 3 CO**
COUNTRY	**St. Lucia**
YEAR	**1994**

			STEP 3							
			C Emissions by Fuel (kg)							**D** Total Emissions (Gg)
			C=(AxB)							
			C1	C2	C3		C4	C5	C6	D= sum
ACTIVITY			Coal	Natural Gas	Oil		Wood / Wood Waste	Charcoal	Other Biomass and Wastes	(C1..C6) / 1 000 000
Energy Industries			0.00	0.00		24,717.00	0.00	0.00	0.00	0.02
Manufacturing Industries and Construction			0.00	0.00		265.60	0.00	0.00	0.00	0.00
Transport	Domestic Aviation [a]					0.00				0.00
					Gasoline	Diesel				
	Road			0.00	10,671,600.00	169,190.00				10.84
	Railways		0.00			0.00				0.00
	National Navigation [a]		0.00			0.00				0.00
Other Sectors	Commercial/Institutional		0.00	0.00		5,303.40	0.00	0.00	0.00	0.01
	Residential		0.00	0.00		0.00	283,358.44	730,931.54	122,606.25	1.14
	Agriculture / Forestry / Fishing	Stationary	0.00	0.00		0.00	0.00	0.00	0.00	0.00
		Mobile		0.00		640.00				0.00
Other (not elsewhere specified)			0.00	0.00		0.00	0.00	0.00	0.00	0.00
Total [a]			**0.00**	**0.00**		**10,871,716.00**	**283,358.44**	**730,931.54**	**122,606.25**	**12.01**
Memo: International Marine Bunkers			0.00		0.00	0.00				0.00
Memo: International Aviation Bunkers					0.00	0.00				0.00

(a) Excludes international bunkers.

This spreadsheet contains sheets 2 of Worksheet 1-3 (NMVOC), in accordance
with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**NON-CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)**
WORKSHEET	**1-3**
SHEETS	**2 OF 3 NMVOC**
COUNTRY	**St. Lucia**
YEAR	**1994**

ACTIVITY			**STEP 2**						
			B **Emission Factors (kg/TJ)**						
			B1	B2	B3		B4	B5	B6
			Coal	Natural Gas	Oil		Wood / Wood Waste	Charcoal	Other Biomass and Wastes
Energy Industries					5				
Manufacturing Industries and Construction						5			
Transport	Domestic Aviation [a]								
					Gasoline	Diesel			
	Road				1500	200			
	Railways								
	National Navigation [a]				200	200			
Other Sectors	Commercial/Institutional				5	5			
	Residential				5	5	600	100	600
	Agriculture / Forestry / Fishing	Stationary							
		Mobile			200	200			
Other (not elsewhere specified)					200	200			
Total [a]									
Memo: International Marine Bunkers									
Memo: International Aviation Bunkers									

(a) Excludes international bunkers.

This spreadsheet contains sheets 3 of Worksheet 1-3 (NMVOC), in accordance
with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	ENERGY
SUBMODULE	NON-CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)
WORKSHEET	1-3
SHEETS	3 OF 3 NMVOC
COUNTRY	St. Lucia
YEAR	1994

ACTIVITY			STEP 3							
			C Emissions by Fuel (kg)							D Total Emissions (Gg)
			C=(AxB)							D= sum (C1..C6) / 1 000 000
			C1 Coal	C2 Natural Gas	C3 Oil		C4 Wood / Wood Waste	C5 Charcoal	C6 Other Biomass and Wastes	
Energy Industries			0.00	0.00		8,239.00	0.00	0.00	0.00	0.01
Manufacturing Industries and Construction			0.00	0.00		132.80	0.00	0.00	0.00	0.00
Transport	Domestic Aviation [a]					0.00				0.00
					Gasoline	Diesel				
	Road			0.00	2,000,925.00	33,838.00				2.03
	Railways		0.00			0.00				0.00
	National Navigation [a]		0.00			0.00				0.00
Other Sectors	Commercial/Institutional		0.00	0.00		1,325.85	0.00	0.00	0.00	0.00
	Residential		0.00	0.00		0.00	34,003.01	10,441.88	14,712.75	0.06
	Agriculture / Forestry / Fishing	Stationary	0.00	0.00		0.00	0.00	0.00	0.00	0.00
		Mobile		0.00		128.00	0.00			0.00
Other (not elsewhere specified)			0.00	0.00		5,746.00	0.00	0.00	0.00	0.01
Total [a]			**0.00**	**0.00**		**2,050,334.65**	**34,003.01**	**10,441.88**	**14,712.75**	**2.11**
Memo: International Marine Bunkers			0.00		0.00	0.00				0.00
Memo: International Aviation Bunkers					0.00	0.00				0.00

(a) Excludes international bunkers.

This spreadsheet contains Worksheet 1-4, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE		ENERGY
SUBMODULE		SO_2 EMISSIONS FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER 1)
WORKSHEET		1-4
SHEETS		1 OF 1 SECTOR [(a)] ....
COUNTRY		St. Lucia
YEAR		1994

		STEP 1	STEP 2					STEP 3
		A Fuel Consumption (TJ)	B Sulphur content of fuel [(b)] (%)	C Sulphur retention in ash (%)	D Abatement efficiency (%)	E Net Calorific Value [(b)] (TJ/kt)	F SO_2 Emission Factor [(b)] (kg/TJ)	G Emissions (t)
FUEL TYPE							F=2 x (B/100) x (1/E) x 1 000 000 x ((100-C)/100) x ((100-D)/100)	G=(AxF)/1000
Coal	low						0.00	0.00
	medium						0.00	0.00
	high						0.00	0.00
Heavy Fuel Oil	low						0.00	0.00
	medium	54.03	3	1	45	40.19	812.89	43.92
	high						0.00	0.00
Light Fuel Oil / Diesel	low						0.00	0.00
	high	1647.8	1	1	45	43.33	251.33	414.14
Diesel (road)		627.76	0.3	1	45	43.33	75.40	47.33
Gasoline (road)		1415.63	0.1	1	45	44.8	24.31	34.41
Jet Kerosene		883.58	0.05	1	45	44.59	12.21	10.79
Oil Shale							0.00	0.00
Other Oil		54.03	3	1	45	40.19	812.89	43.92
Natural Gas[(b)]							0.00	0.00
Municipal Waste							0.00	0.00
Industrial Waste							0.00	0.00
Black Liquor							0.00	0.00
Fuelwood		81.2	0.2	1	45	15	145.20	11.79
Other Biomass		104.44	0.03	1	45	30	10.89	1.14
Total		**4868.47**						607.44
Memo: Fuels for International Marine Bunkers							0.00	0.00
Memo: Fuels for International Aviation Bunkers							0.00	0.00

(a) This method can be applied once for total fuel combustion or can be repeated for each sector. Copy the sheet as many times as there are sectors to be calculated. If the calculations are done by sector, care must be taken to account for all national fuel consumption.
Please provide links to the Sectoral Reports and Summary Tables in sheet OVERVIEW.XLS as appropiate.

(b) The sulphur content of natural gas is expressed in gram per cubic meter and the net calorific value should be expressed in kilo Joules per cubic meter. The sulphur content for natural gas (in column B) will not be divided by 100 when calculating the emission factor in column F.

This spreadsheet contains sheet 1 of Worksheet 1-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**		
SUBMODULE	**EMISSIONS FROM AIRCRAFT (TIER 2)**		
WORKSHEET	**1-5**		
SHEETS	**1 OF 3 FUEL CONSUMPTION FOR DOMESTIC AND INTERNATIONAL AVIATION**		
COUNTRY	**St. Lucia**		
YEAR	**1994**		
	STEP 1		
	A Total Amount of Fuel Sold for All Aviation (kt)	B Total Amount of Fuel Sold for Domestic Aviation (kt)	C Total Amount of Fuel Sold for International Aviation (kt)
			C=(A-B)
Fuel Sold			0.00

This spreadsheet contains sheet 2 of Worksheet 1-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**					
SUBMODULE	**EMISSIONS FROM AIRCRAFT (TIER 2)**					
WORKSHEET	**1-5**					
SHEETS	**2 OF 3 FUEL CONSUMPTION FOR LTO AND CRUISE ACTIVITIES**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 2			**STEP 3**		
	D Total Number of LTO's per Aircraft type	E Fuel Consumption per LTO (t/LTO)	F Fuel Consumption for LTO Activities (t)	G Total Fuel Sold (t)	H Total Fuel Consumption for Cruise Activities (t)	I Fuel Consumption for Cruise Activities (t)
DOMESTIC AIRCRAFT TYPE			F=DxE		H=G-F	$I=Hx(D_a/D_{TOTALa})$
a_1			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
a_n			0.00			0.00
TOTAL a	**0.00**	TOTAL a	**0.00**	G=Bx1000 0.00	0.00	**0.00**
INTERNATIONAL AIRCRAFT TYPE						$I=Hx(D_b/D_{TOTALb})$
b_1			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
.			0.00			0.00
b_n			0.00			0.00
TOTAL b	**0.00**	TOTAL b	**0.00**	G=Cx1000 0.00	0.00	**0.00**

This spreadsheet contains sheet 3 (CO_2) of Worksheet 1-5, in accordance with the

Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	ENERGY				
SUBMODULE	EMISSIONS FROM AIRCRAFT (TIER 2)				
WORKSHEET	1-5				
SHEETS	3 OF 3 EMISSIONS OF CO_2				
COUNTRY	St. Lucia				
YEAR	1994				
	STEP 4				
	J Emission Factor per LTO (kg/LTO)	K Emissions from LTO Activities (t)	L Emission Factor per Fuel Consumption for Cruise Activities (kg/t)	M Emissions from Cruise Activities (t)	N Total Emissions from Aircraft (Gg)
DOMESTIC AIRCRAFT TYPE		K=(DxJ)/1000		M=(IxL)/1000	N=(K+M)/1000
a_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
a_n		0.00		0.00	0.00
	TOTAL a	**0.00**	TOTAL a	**0.00**	**0.00**
INTERNATIONAL AIRCRAFT TYPE					
b_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
b_n		0.00		0.00	0.00
	TOTAL b	**0.00**	TOTAL b	**0.00**	**0.00**

This spreadsheet contains sheet 3 (CH_4) of Worksheet 1-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**				
SUBMODULE	**EMISSIONS FROM AIRCRAFT (TIER 2)**				
WORKSHEET	**1-5**				
SHEETS	**3 OF 3 EMISSIONS OF CH_4**				
COUNTRY	**St. Lucia**				
YEAR	**1994**				
	STEP 4				
	J Emission Factor per LTO (kg/LTO)	K Emissions from LTO Activities (t)	L Emission Factor per Fuel Consumption for Cruise Activities (kg/t)	M Emissions from Cruise Activities (t)	N Total Emissions from Aircraft (Gg)
DOMESTIC AIRCRAFT TYPE		K=(DxJ)/1000		M=(IxL)/1000	N=(K+M)/1000
a_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
a_n		0.00		0.00	0.00
	TOTAL a	**0.00**	TOTAL a	**0.00**	**0.00**
INTERNATIONAL AIRCRAFT TYPE					
b_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
b_n		0.00		0.00	0.00
	TOTAL b	**0.00**	TOTAL b	**0.00**	**0.00**

This spreadsheet contains sheet 3 (N_2O) of Worksheet 1-5, in accordance with the

Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**EMISSIONS FROM AIRCRAFT (TIER 2)**
WORKSHEET	**1-5**
SHEETS	**3 OF 3 EMISSIONS OF N_2O**
COUNTRY	**St. Lucia**
YEAR	**1994**

	STEP 4				
	J Emission Factor per LTO (kg/LTO)	K Emissions from LTO Activities (t)	L Emission Factor per Fuel Consumption for Cruise Activities (kg/t)	M Emissions from Cruise Activities (t)	N Total Emissions from Aircraft (Gg)
DOMESTIC AIRCRAFT TYPE		K=(DxJ)/1000		M=(IxL)/1000	N=(K+M)/1000
a_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
a_n		0.00		0.00	0.00
	TOTAL a	**0.00**	TOTAL a	**0.00**	**0.00**
INTERNATIONAL AIRCRAFT TYPE					
b_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
b_n		0.00		0.00	0.00
	TOTAL b	**0.00**	TOTAL b	**0.00**	**0.00**

This spreadsheet contains sheet 3 (NO_x) of Worksheet 1-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**				
SUBMODULE	**EMISSIONS FROM AIRCRAFT (TIER 2)**				
WORKSHEET	**1-5**				
SHEETS	**3 OF 3 EMISSIONS OF NO_x**				
COUNTRY	**St. Lucia**				
YEAR	**1994**				
	STEP 4				
	J Emission Factor per LTO (kg/LTO)	K Emissions from LTO Activities (t)	L Emission Factor per Fuel Consumption for Cruise Activities (kg/t)	M Emissions from Cruise Activities (t)	N Total Emissions from Aircraft (Gg)
DOMESTIC AIRCRAFT TYPE		K=(DxJ)/1000		M=(IxL)/1000	N=(K+M)/1000
a_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
a_n		0.00		0.00	0.00
	TOTAL a	**0.00**	TOTAL a	**0.00**	**0.00**
INTERNATIONAL AIRCRAFT TYPE					
b_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
b_n		0.00		0.00	0.00
	TOTAL b	**0.00**	TOTAL b	**0.00**	**0.00**

This spreadsheet contains sheet 3 (CO) of Worksheet 1-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**				
SUBMODULE	**EMISSIONS FROM AIRCRAFT (TIER 2)**				
WORKSHEET	**1-5**				
SHEETS	**3 OF 3 EMISSIONS OF CO**				
COUNTRY	**St. Lucia**				
YEAR	**1994**				
	STEP 4				
	J Emission Factor per LTO (kg/LTO)	K Emissions from LTO Activities (t)	L Emission Factor per Fuel Consumption for Cruise Activities (kg/t)	M Emissions from Cruise Activities (t)	N Total Emissions from Aircraft (Gg)
DOMESTIC AIRCRAFT TYPE		K=(DxJ)/1000		M=(IxL)/1000	N=(K+M)/1000
a_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
a_n		0.00		0.00	0.00
	TOTAL a	**0.00**	TOTAL a	**0.00**	**0.00**
INTERNATIONAL AIRCRAFT TYPE					
b_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
b_n		0.00		0.00	0.00
	TOTAL b	**0.00**	TOTAL b	**0.00**	**0.00**

This spreadsheet contains sheet 3 (NMVOC) of Worksheet 1-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**				
SUBMODULE	**EMISSIONS FROM AIRCRAFT (TIER 2)**				
WORKSHEET	**1-5**				
SHEETS	**3 OF 3 EMISSIONS OF NMVOC**				
COUNTRY	**St. Lucia**				
YEAR	**1994**				
	STEP 4				
	J Emission Factor per LTO (kg/LTO)	K Emissions from LTO Activities (t)	L Emission Factor per Fuel Consumption for Cruise Activities (kg/t)	M Emissions from Cruise Activities (t)	N Total Emissions from Aircraft (Gg)
DOMESTIC AIRCRAFT TYPE		K=(DxJ)/1000		M=(IxL)/1000	N=(K+M)/1000
a_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
a_n		0.00		0.00	0.00
	TOTAL a	**0.00**	TOTAL a	**0.00**	**0.00**
INTERNATIONAL AIRCRAFT TYPE					
b_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
b_n		0.00		0.00	0.00
	TOTAL b	**0.00**	**TOTAL b**	**0.00**	**0.00**

This spreadsheet contains sheet 3 (SO_2) of Worksheet 1-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**				
SUBMODULE	**EMISSIONS FROM AIRCRAFT (TIER 2)**				
WORKSHEET	**1-5**				
SHEETS	**3 OF 3 EMISSIONS OF SO_2**				
COUNTRY	**St. Lucia**				
YEAR	**1994**				
	STEP 4				
	J Emission Factor per LTO (kg/LTO)	K Emissions from LTO Activities (t)	L Emission Factor per Fuel Consumption for Cruise Activities (kg/t)	M Emissions from Cruise Activities (t)	N Total Emissions from Aircraft (Gg)
DOMESTIC AIRCRAFT TYPE		K=(DxJ)/1000		M=(IxL)/1000	N=(K+M)/1000
a_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
a_n		0.00		0.00	0.00
	TOTAL a	**0.00**	TOTAL a	**0.00**	**0.00**
INTERNATIONAL AIRCRAFT TYPE					
b_1		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
.		0.00		0.00	0.00
b_n		0.00		0.00	0.00
	TOTAL b	**0.00**	TOTAL b	**0.00**	**0.00**

This spreadsheet contains Worksheet 1-6, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE		ENERGY				
SUBMODULE		METHANE EMISSIONS FROM COAL MINING AND HANDLING				
WORKSHEET		1-6				
SHEETS		1 OF 1				
COUNTRY		St. Lucia				
YEAR		1994				
		STEP 1			STEP 2	
		A Amount of Coal Produced (millions t)	B Emission Factor (m^3 CH_4 / t)	C Methane Emissions (millions m^3)	D Conversion Factors (0.67 Gg CH_4 /million m^3)	E Methane Emissions (Gg CH_4)
				C=(AxB)		E=(CxD)
Underground Mines	Mining			0.00	0.67	0.00
	Post-Mining			0.00	0.67	0.00
Surface Mines	Mining			0.00	0.67	0.00
	Post-Mining			0.00	0.67	0.00
					Total	**0.00**

This spreadsheet contains Worksheet 1-7, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**METHANE EMISSIONS FROM OIL AND GAS ACTIVITIES (TIER 1)**
WORKSHEET	**1-7**
SHEETS	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

Category	A Activity	B Emission Factor	C CH_4 Emissions (Kg CH_4)	D Emissions CH_4 (Gg CH_4)
			C = (A x B)	D = (C / 1 000 000)
OIL				
Exploration *(Optional if data is locally available)* [(a)]	*number of wells drilled*	*Kg CH_4 / well drilled*	0.00	0.00
Production [(b)]	*PJ oil produced*	*Kg CH_4 / PJ*	0.00	0.00
Transport	*PJ oil loaded in tankers*	*Kg CH_4 / PJ*	0.00	0.00
Refining	*PJ oil refined*	*Kg CH_4 / PJ refined*	0.00	0.00
Storage	*PJ oil refined*	*Kg CH_4 / PJ refined*	0.00	0.00
			TOTAL CH_4 FROM OIL	**0.00**
GAS				
Production [(b)] / Processing	*PJ gas consumed*	*Kg CH_4 / PJ*	0.00	0.00
Transmission and Distribution	*PJ gas consumed*	*Kg CH_4 / PJ*	0.00	0.00
Other Leakage	*PJ gas consumed*			
	- non-residential gas consumed		0.00	0.00
	- Residential gas consumed		0.00	0.00
			TOTAL CH_4 FROM GAS	**0.00**
VENTING AND FLARING FROM OIL/GAS PRODUCTION [(c)]	*PJ oil and gas produced*	*Kg CH_4 / PJ*		
	- Oil		0.00	0.00
	- Gas		0.00	0.00
	- Combined		0.00	0.00
			TOTAL CH_4 FROM OIL AND GAS	**0.00**

(a) Emission Factors are not provided.
(b) If using default emission factors these categories will include emissions from production other than venting and flaring.
(c) If using default emission factors, emissions from venting and flaring from all oil and production should be acconted for here.

This spreadsheet contains sheet 1 of Worksheet 1-8, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**OZONE PRECURSORS AND SO_2 FROM OIL REFINING**
WORKSHEET	**1-8 OZONE PRECURSORS AND SO_2 FROM REFINING**
SHEETS	**1 of 4**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Crude Oil Throughput (kt)	B Pollutant	C Emission factor [a] (kg/t)	D Emissions (t)	E Emissions (Gg)
			D=(AxC)	E=D/1000
	CO	0.09	0.00	0.00
	NO_x	0.06	0.00	0.00
	NMVOC	0.62	0.00	0.00
	SO_2	0.93	0.00	0.00

(a) Default values. Use local values where possible, particularly for NMVOCs for which emission factors vary widely.
The default values shown above have been derived from the values given in the IPCC Reference Manual using an
average crude oil density of 860 kg/cubic meter (33 degrees API).

This spreadsheet contains sheet 2 of Worksheet 1-8, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**OZONE PRECURSORS AND SO_2 FROM OIL REFINING**
WORKSHEET	**1-8 OZONE PRECURSORS AND SO_2 FROM CATALYTIC CRACKING**
SHEETS	**2 OF 4**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Catalytic Cracker Throughput (kt)	B Pollutant	C Emission factor [(a)] (kg/t)	D Emissions (t)	E Emissions (Gg)
			D=(AxC)	E=D/1000
	CO	42.6	0.00	0.00
	NOx	0.2	0.00	0.00
	NMVOC	0.6	0.00	0.00
	SO_2	1.5	0.00	0.00

(a) Default values. Use local values where possible.
The default values shown above have been derived from the values given in the IPCC Reference Manual using an average oil density of 920 kg/cubic meter (22 degrees API).

This spreadsheet contains sheet 3 of Worksheet 1-8, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**OZONE PRECURSORS AND SO_2 FROM OIL REFINING**
WORKSHEET	**1-8 SO_2 FROM SULPHUR RECOVERY PLANTS**
SHEETS	**3 OF 4**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Quantity of Sulphur Recovered (t)	B Emission Factor (kg/t)	C Emissions (kg)	D Emissions (Gg)
		C=AxB	D=(C/1 000 000)
	139	0.00	0.00

This spreadsheet contains sheet 4 of Worksheet 1-8, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**ENERGY**
SUBMODULE	**OZONE PRECURSORS AND SO_2 FROM OIL REFINING**
WORKSHEET	**1-8 NMVOC EMISSIONS FROM STORAGE AND HANDLING**
SHEETS	**4 OF 4**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Crude Oil Throughput (kt)	B Storage Type	C Emission factor (kg/t)	D Emissions (t)	E Emissions (Gg)
			D=(AxC)	E=D/1000
	Secondary Seals	0.2	0.00	0.00
	Primary Seals	0.7	0.00	0.00
	Fixed Roof	4.9	0.00	0.00

This spreadsheet contains sheet 1 of Worksheet 2-1, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**CEMENT PRODUCTION**
WORKSHEET	**2-1**
SHEET	**1 OF 2 CO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1

A	B	C	D
Quantity of Clinker or Cement Produced (t)	Emission Factor (t CO_2/t clinker or cement produced)	CO_2 Emitted (t)	CO_2 Emitted (Gg)
		C = (A x B)	D = C/1000
		0.00	0.00

This spreadsheet contains sheet 2 of Worksheet 2-1, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**		
SUBMODULE	**CEMENT PRODUCTION**		
WORKSHEET	**2-1**		
SHEET	**2 OF 2 SO_2 EMISSIONS**		
COUNTRY	**St. Lucia**		
YEAR	**1994**		
STEP 2			
A Quantity of Cement Produced (t)	B Emission Factor (kg SO_2 /t cement produced)	C SO_2 Emitted (kg)	D SO_2 Emitted (Gg)
		C = (A x B)	D = C/1 000 000
		0.00	0.00

This spreadsheet contains Worksheet 2-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**PRODUCTION OF LIME**
WORKSHEET	**2-2**
SHEET	**1 OF 1 CO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

Lime Type	A Quantity of Lime Produced (t)	B Emission Factor (t CO_2/t quicklime or dolomitic lime produced)	C CO_2 Emitted (t)	D CO_2 Emitted (Gg)
			C = (A x B)	D = C/1000
Quicklime			0.00	0.00
Dolomitic Lime			0.00	0.00
			Total (Gg):	0.00

This spreadsheet contains Worksheet 2-3, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**LIMESTONE AND DOLOMITE USE**
WORKSHEET	**2-3**
SHEET	**1 OF 1 CO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

Material Type	A Quantity of Limestone or Dolomite Used (t)	B Emission Factor (kg CO_2/t limestone or dolomite used)	C CO_2 Emitted (kg)	D CO_2 Emitted (Gg)
			C = (A x B)	D = C/ 1000 000
Limestone			0.00	0.00
Dolomite			0.00	0.00
			Total (Gg):	0.00

This spreadsheet contains sheet 1 of Worksheet 2-4, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**SODA ASH PRODUCTION AND USE**
WORKSHEET	**2-4**
SHEET	**1 OF 2 SODA ASH PRODUCTION- CO_2 - EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1			
A Quantity of Trona Utilised (t)	B Emission Factor (t CO_2/t trona utilised)	C CO_2 Emitted (t)	D CO_2 Emitted (Gg)
		C = (A x B)	D = C/1000
		0.00	0.00

This spreadsheet contains sheet 2 of Worksheet 2-4, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**SODA ASH PRODUCTION AND USE**
WORKSHEET	**2-4**
SHEET	**2 OF 2 SODA ASH USE - CO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 2

A Quantity of Soda Ash Used (t)	B Emission Factor (kg CO_2/t soda ash used)	C CO_2 Emitted (kg)	D CO_2 Emitted (Gg)
		C = (A x B)	D = C/1 000 000
		0.00	0.00

This spreadsheet contains sheet 1 of Worksheet 2-5, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**PRODUCTION AND USE OF MISCELLANEOUS MINERAL PRODUCTS**
WORKSHEET	**2-5**
SHEET	**1 OF 5 ASPHALT ROOFING PRODUCTION - NMVOC EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1

Process Type	A Quantity of Asphalt Roofing Produced (t)	B Emission Factor (kg NMVOC/t asphalt roofing produced)	C NMVOC Emitted (kg)	D NMVOC Emitted (Gg)
			C = (A x B)	D = C/1 000 000
Saturation Process			0.00	0.00
Blowing Process			0.00	0.00
			Total (Gg):	0.00

This spreadsheet contains sheet 2 of Worksheet 2-5, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**PRODUCTION AND USE OF MISCELLANEOUS MINERAL PRODUCTS**
WORKSHEET	**2-5**
SHEET	**2 OF 5 ASPHALT ROOFING PRODUCTION - CO EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 2

A Quantity of Asphalt Roofing Produced (t)	B Emission Factor (kg CO /t asphalt roofing produced)	C CO Emitted (kg)	D CO Emitted (Gg)
		C = (A x B)	D = C/1 000 000
		0.00	0.00

This spreadsheet contains sheet 3 of Worksheet 2-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**PRODUCTION AND USE OF MISCELLANEOUS MINERAL PRODUCTS**
WORKSHEET	**2-5**
SHEET	**3 OF 5 ROAD PAVING WITH ASPHALT- NMVOC EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 3				
Emission Source	A Quantity of Road Paving Material Used (t)	B Emission Factor (kg NMVOC/t road paving material used)	C NMVOC Emitted (kg)	D NMVOC Emitted (Gg)
			C = (A x B)	D = C/1 000 000
Asphalt Plant	0	0.023	0.00	0.00000
Road Surface	5339.781	320	1,708,729.92	1.70873
			Total (Gg):	1.70873

This spreadsheet contains sheet 4 of Worksheet 2-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**PRODUCTION AND USE OF MISCELLANEOUS MINERAL PRODUCTS**
WORKSHEET	**2-5**
SHEET	**4 OF 5 PRODUCTION OF OTHER MINERAL PRODUCTS - GLASS PRODUCTION - NMVOC EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 4				
Glass Type	A Quantity of Glass Produced (t)	B Emission Factor (kg NMVOC/t glass produced)	C NMVOC Emitted (kg)	D NMVOC Emitted (Gg)
			C = (A x B)	D = C/1 000 000
Container Glass			0.00	0.00
Flat Glass			0.00	0.00
			Total (Gg):	0.00

This spreadsheet contains sheet 5 of Worksheet 2-5, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**PRODUCTION AND USE OF MISCELLANEOUS MINERAL PRODUCTS**
WORKSHEET	**2-5**
SHEET	**5 OF 5 PRODUCTION OF OTHER MINERAL PRODUCTS - CONCRETE PUMICE STONE - SO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 5

A Quantity of Concrete Pumice Stone Produced (t)	B Emission Factor (kg SO_2/t concrete pumice stone produced)	C SO_2 Emitted (kg)	D SO_2 Emitted (Gg)
		C = (A x B)	D = C/1 000 000
1	0.5	0.50	0.0000005

This spreadsheet contains sheet 1 of Worksheet 2-6, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**AMMONIA PRODUCTION**
WORKSHEET	**2-6**
SHEET	**1 OF 3 TIER 1a - CO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1

A Amount of Gas Consumed (m^3)	B Carbon Content of Gas (kg/m^3)	C Conversion Ratio	D CO_2 Emitted (kg)	E CO_2 Emitted (Gg)
		44/12	D = (A x B x C)	E = D/1 000 000
		44/12	0.00	0.00

This spreadsheet contains sheet 2 of Worksheet 2-6, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**		
SUBMODULE	**AMMONIA PRODUCTION**		
WORKSHEET	**2-6**		
SHEET	**2 OF 3 TIER 1b - CO_2 EMISSIONS**		
COUNTRY	**St. Lucia**		
YEAR	**1994**		
STEP 2			
A Amount of Ammonia Produced (t)	B Emission Factor (t CO_2/t ammonia produced)	C CO_2 Emitted (t)	D CO_2 Emitted (Gg)
		C = (A x B)	D = C/1000
		0.00	0.00

This spreadsheet contains sheet 3 of Worksheet 2-6, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**AMMONIA PRODUCTION**
WORKSHEET	**2-6**
SHEET	**3 OF 3 NMVOC, CO AND SO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 3

A Amount of Ammonia Produced (t)	B Emission Factor (kg pollutant/ t ammonia produced)	C Pollutant Emitted (kg)	D Pollutant Emitted (Gg)	
		C = (A x B)	D = C/1 000 000	
	NMVOC	0.00	*NMVOC*	0.00
	CO	0.00	*CO*	0.00
	SO_2	0.00	*SO_2*	0.00

This spreadsheet contains Worksheet 2-7, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**		
SUBMODULE	**NITRIC ACID PRODUCTION**		
WORKSHEET	**2-7**		
SHEET	**I OF 1 N_2O AND NO_x EMISSIONS**		
COUNTRY	**St. Lucia**		
YEAR	**1994**		
A Amount of Nitric Acid Produced (t)	B Emission Factor (kg pollutant/t nitric acid produced)	C Pollutant Emitted (kg)	D Pollutant Emitted (Gg)
		C = (A x B)	D = C/1 000 000
	N_2O	0.00	*N_2O* 0.00
	NO_x	0.00	*NO_x* 0.00

This spreadsheet contains Worksheet 2-8, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**		
SUBMODULE	**ADIPIC ACID PRODUCTION**		
WORKSHEET	**2-8**		
SHEET	**1OF 1 N_2O, NO_x , NMVOC AND CO EMISSIONS**		
COUNTRY	**St. Lucia**		
YEAR	**1994**		
A Amount of Adipic Acid Produced (t)	B Emission Factor (kg pollutant / t adipic acid produced	C Pollutant Emitted (kg)	D Pollutant Emitted (Gg)
		C = (A x B)	D = C/1 000 000
	N_2O	0.00	*N_2O* 0.00
	NO_x	0.00	*NO_x* 0.00
	NMVOC	0.00	*NMVOC* 0.00
	CO	0.00	*CO* 0.00

This spreadsheet contains sheet 1 of Worksheet 2-9, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**CARBIDE PRODUCTION**
WORKSHEET	**2-9**
SHEET	**1 OF 4 SILICON CARBIDE PRODUCTION - CO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1

A Consumption Of Coke (t)	B Carbon Content in Coke (%)	C Carbon Input Sequestered In Product (%)	D CO_2 Emitted (t)	E CO_2 Emitted (Gg)
			D = A x B (100-C) x 3.67/10000	E = D/1000
			0.00	0.00

This spreadsheet contains sheet 2 of Worksheet 2-9, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**		
SUBMODULE	**CARBIDE PRODUCTION**		
WORKSHEET	**2-9**		
SHEET	**2 OF 4 SILICON CARBIDE PRODUCTION - TIER 1a - CH_4 EMISSIONS**		
COUNTRY	**St. Lucia**		
YEAR	**1994**		
STEP 2			
A Amount of Petrol Coke Consumed (t)	B Emission Factor (kg CH_4 / t petrol coke consumed)	C CH_4 Emitted (kg)	D CH_4 Emitted (Gg)
		C = (A x B)	D = C/1 000 000
		0.00	0.00

This spreadsheet contains sheet 3 of Worksheet 2-9, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**CARBIDE PRODUCTION**
WORKSHEET	**2-9**
SHEET	**3 OF 4 SILICON CARBIDE PRODUCTION - TIER 1b - CH_4 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 3

A	B	C	D
Amount of Silicon Carbide Produced (t)	Emission Factor (kg CH_4 / t silicon carbide produced)	CH_4 Emitted (kg)	CH_4 Emitted (Gg)
		C = (A x B)	D = C/1 000 000
		0.00	0.00

This spreadsheet contains sheet 4 of Worksheet 2-9, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**CARBIDE PRODUCTION**
WORKSHEET	**2-9**
SHEET	**4 OF 4 CALCIUM CARBIDE PRODUCTION - CO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 4

A Amount of Carbide Produced (t)	B Emission Factor (t CO_2 / t carbide produced)	C CO_2 Emitted (t)	D CO_2 Emitted (Gg)
		C = (A x B)	D = C/1000
		0.00	0.00
		0.00	0.00
		0.00	0.00
		Total (Gg):	0.00

This spreadsheet contains sheet 1 of Worksheet 2-10, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**			
SUBMODULE	**PRODUCTION OF OTHER CHEMICALS**			
WORKSHEET	**2-10**			
SHEET	**1 OF 5 CH_4 EMISSIONS**			
COUNTRY	**St. Lucia**			
YEAR	**1994**			
STEP 1				
	A	B	C	D
Chemical	Amount of Chemical Produced (t)	Emission Factor (kg CH_4 / t chemical produced)	CH_4 Emitted (kg)	CH_4 Emitted (Gg)
			C = (A x B)	D = C/1 000 000
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			Total (Gg):	0.00

This spreadsheet contains sheet 2 of Worksheet 2-10, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**PRODUCTION OF OTHER CHEMICALS**
WORKSHEET	**2-10**
SHEET	**2 OF 5 NO_x EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 2

Chemical	A Amount of Chemical Produced (t)	B Emission Factor (kg NO_x / t chemical produced)	C NO_x Emitted (kg)	D NO_x Emitted (Gg)
			C = (A x B)	D = C/1 000 000
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			Total (Gg):	0.00

This spreadsheet contains sheet 3 of Worksheet 2-10, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**			
SUBMODULE	**PRODUCTION OF OTHER CHEMICALS**			
WORKSHEET	**2-10**			
SHEET	**3 OF 5 NMVOC EMISSIONS**			
COUNTRY	**St. Lucia**			
YEAR	**1994**			
STEP 3				
Chemical	A Amount of Chemical Produced (t)	B Emission Factor (kg NMVOC / t chemical produced)	C NMVOC Emitted (kg)	D NMVOC Emitted (Gg)
			C = (A x B)	D = C/1 000 000
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			Total (Gg):	0.00

This spreadsheet contains sheet 4 of Worksheet 2-10, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**PRODUCTION OF OTHER CHEMICALS**
WORKSHEET	**2-10**
SHEET	**4 OF 5 CO EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 4

Chemical	A Amount of Chemical Produced (t)	B Emission Factor (kg CO / t chemical produced)	C CO Emitted (kg)	D CO Emitted (Gg)
			C = (A x B)	D = C/1 000 000
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			Total (Gg):	0.00

This spreadsheet contains sheet 5 of Worksheet 2-10, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**PRODUCTION OF OTHER CHEMICALS**
WORKSHEET	**2-10**
SHEET	**5 OF 5 SO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 5

Chemical	A Amount of Chemical Produced (t)	B Emission Factor (kg SO_2 / t chemical produced)	C SO_2 Emitted (kg)	D SO_2 Emitted (Gg)
			C = (A x B)	D = C/1 000 000
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			Total (Gg):	0.00

This spreadsheet contains sheet 1 of Worksheet 2-11, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**METAL PRODUCTION**
WORKSHEET	**2-11**
SHEET	**1 OF 11 TIER 1a - CO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1

	A Mass of Reducing Agent (t)	B Emission Factor (t CO_2/t reducing agent)	C (Carbon content of ore minus carbon content of metal) x 3.67 (t CO_2)	D CO_2 Emitted (t)	E CO_2 Emitted (Gg)
				D = (A x B) + C	E = D/1000
Iron and steel production				0.00	0.00
Ferroalloys production				0.00	0.00
Aluminium production				0.00	0.00
Other				0.00	0.00

This spreadsheet contains sheet 2 of Worksheet 2-11, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**METAL PRODUCTION**
WORKSHEET	**2-11**
SHEET	**2 OF 11 IRON AND STEEL - TIER 1b - CO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 2			
A	B	C	D
Amount of Iron or Steel Produced (t)	Emission Factor (t CO_2/t of iron or steel produced)	CO_2 Emitted (t)	CO_2 Emitted (Gg)
		C = (A x B)	D = C/1000
		0.00	0.00

This spreadsheet contains sheet 3 of Worksheet 2-11, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**METAL PRODUCTION**
WORKSHEET	**2-11**
SHEET	**3 OF 11 IRON AND STEEL - NO_x, NMVOC, CO AND SO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 3

A Amount of Iron or Steel Produced (t)	B Emission Factor (g gas/t of iron or steel produced)	C Gas Emitted (g)	D Gas Emitted (Gg)	
		C = (A x B)	D = C/1 000 000 000	
	NO_x	0.00	*NO_x*	0.00
	NMVOC	0.00	*NMVOC*	0.00
	CO	0.00	*CO*	0.00
	SO_2	0.00	*SO_2*	0.00

This spreadsheet contains sheet 4 of Worksheet 2-11, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**		
SUBMODULE	**METAL PRODUCTION**		
WORKSHEET	**2-11**		
SHEET	**4 OF 11 FERROALLOYS - TIER 1b - CO_2 EMISSIONS**		
COUNTRY	**St. Lucia**		
YEAR	**1994**		
STEP 4			
A Amount of Ferroalloy Produced (t)	B Emission Factor (t CO_2/t ferroalloy produced)	C CO_2 Emitted (t)	D CO_2 Emitted (Gg)
		C = (A x B)	D = C/1000
		0.00	0.00

This spreadsheet contains sheet 5 of Worksheet 2-11, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**		
SUBMODULE	**METAL PRODUCTION**		
WORKSHEET	**2-11**		
SHEET	**5 OF 11 ALUMINIUM - TIER 1b - CO_2 EMISSIONS**		
COUNTRY	**St. Lucia**		
YEAR	**1994**		
STEP 5			
A	B	C	D
Amount of Aluminium Produced (t)	Emission Factor (t CO_2/t aluminium produced)	CO_2 Emitted (t)	CO_2 Emitted (Gg)
		C = (A x B)	D = C/1000
		0.00	0.00

This spreadsheet contains sheet 6 of Worksheet 2-11, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESS**
SUBMODULE	**METAL PRODUCTION**
WORKSHEET	**2-11**
SHEET	**6 OF 11 ALUMINIUM - TIER 1b - CF_4 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 6

A	B	C	D	E	F	G	H	I
Type of cell	Amount of Aluminium Produced (tonnes)	Equation Constant CF_4	Average Fraction of Pot Gas During Anode Effects	Current Efficiency (fraction)	Number of Anode Effects Per Day	Anode Effect Duration (minutes)	CF_4 Emitted (kg)	CF_4 Emitted (Gg)
		1.698					H = (B x C x D x E x F x G)	I = H/1 000 000
		1.698					0	0

This spreadsheet contains sheet 7 of Worksheet 2-11, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESS**
SUBMODULE	**METAL PRODUCTION**
WORKSHEET	**2-11**
SHEET	**7 OF 11 ALUMINIUM - TIER 1b - C_2F_6 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 7

A	B	C	D	E	F	G	H	I
Type of cell	Amount of Aluminium Produced (tonnes)	Equation Constant C_2F_6	Average Fraction of Pot Gas During Anode Effects	Current Efficiency (fraction)	Number of Anode Effects Per Day	Anode Effect Duration (minutes)	C_2F_6 Emitted (kg)	C_2F_6 Emitted (Gg)
		0.1698					H = (B x C x D x E x F x G)	I = H/1 000 000
		0.1698					0.00	0.00

This spreadsheet contains sheet 8 of Worksheet 2-11, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**METAL PRODUCTION**
WORKSHEET	**2-11**
SHEET	**8 OF 11 ALUMINIUM - TIER 1c - CF_4 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 8

A	B	C	D
Amount of Aluminium Produced (t)	Emission Factor (kg CF_4/t aluminium produced)	CF_4 Emitted (kg)	CF_4 Emitted (Gg)
		C = (A x B)	D = C/1 000 000
		0.00	0.00

This spreadsheet contains sheet 9 of Worksheet 2-11, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**METAL PRODUCTION**
WORKSHEET	**2-11**
SHEET	**9 OF 11 ALUMINIUM - TIER 1c - C_2F_6 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 9

A	B	C
Total CF_4 Emissions (Gg)	C_2F_6 Emission Factor (C_2F_6/CF_4)	C_2F_6 Emitted (Gg)
	0.1	C = (A x B)
	0.1	0.00

This spreadsheet contains sheet 10 of Worksheet 2-11, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**METAL PRODUCTION -**
WORKSHEET	**2-11**
SHEET	**10 OF 11 ALUMINIUM - NO_x, CO, SO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 10

A Amount of Aluminium Produced (t)	B Emission Factor (kg gas/t aluminium produced)	C Pollutant Emitted (kg)	D Pollutant Emitted (Gg)
		C = (A x B)	D = C/1 000 000
	NO_x	0.00	*NO_x* 0.00
	CO	0.00	*CO* 0.00
	SO_2	0.00	*SO_2* 0.00

This spreadsheet contains sheet 11 of Worksheet 2-11, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**METAL PRODUCTION**
WORKSHEET	**2-11**
SHEET	**11 OF 11 SF_6 USED IN ALUMINIUM AND MAGNESIUM FOUNDRIES - SF_6 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 11

A	B	C
Consumption of SF_6 (t)	SF_6 Emitted (t)	SF_6 Emitted (Gg)
	B = A	C = B/1000
	0.00	0.00

This spreadsheet contains sheet 1 of Worksheet 2-12, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**PULP AND PAPER INDUSTRIES**
WORKSHEET	**2-12**
SHEET	**1 OF 2 NO_X , NMVOC AND CO EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1

Pulp Process Type	A Quantity of Air Dried Pulp Produced (t)	B Emission Factor (kg gas /t air dried pulp produced)	C Pollutant Emitted (kg)		D Pollutant Emitted (Gg)
			C = (A x B)		D = C/1 000 000
Kraft		*NO_x*	0.00	*NO_x*	0.00
Kraft		*NMVOC*	0.00	*NMVOC*	0.00
Kraft		*CO*	0.00	*CO*	0.00

This spreadsheet contains sheet 2 of Worksheet 2-12, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**PULP AND PAPER INDUSTRIES**
WORKSHEET	**2-12**
SHEET	**2 OF 2 SO_2 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 2

	A	B	C	D
Pulp Process Type	Quantity of Air Dried Pulp Produced (t)	Emission Factor (kg SO_2/t air dried pulp produced)	SO_2 Emitted (kg)	SO_2 Emitted (Gg)
			C = (A x B)	D = C/1 000 000
Kraft			0.00	0.00
Acid Sulphite			0.00	0.00
			0.00	0.00
			0.00	0.00
			Total (Gg):	0.00

This spreadsheet contains sheet 1 of Worksheet 2-13, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**			
SUBMODULE	**FOOD AND DRINK**			
WORKSHEET	**2-13**			
SHEET	**1 OF 2 ALCOHOLIC BEVERAGE PRODUCTION - NMVOC EMISSIONS**			
COUNTRY	**St. Lucia**			
YEAR	**1994**			
STEP 1				
Alcoholic Beverage Type	A Quantity of Alcoholic Beverage Produced (hl)	B Emission Factor (kg NMVOC/hL beverage produced)	C NMVOC Emitted (kg)	D NMVOC Emitted (Gg)
			C = (A x B)	D = C/1 000 000
Rum	14081.81	15	211,227.15	0.21123
Brandy	64	3.5	224.00	0.00022
Gin	111	15	1,665.00	0.00167
Vodka	106	15	1,590.00	0.00159
Rum based liquors	162	15	2,430.00	0.00243
Beer	23944.2	0.035	838.05	0.00084
			0.00	0.00000
			0.00	0.00000
			Total (Gg):	0.21797

This spreadsheet contains sheet 2 of Worksheet 2-13, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**FOOD AND DRINK**
WORKSHEET	**2-13**
SHEET	**2 OF 2 BREAD AND OTHER FOOD PRODUCTION - NMVOC EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 2

Food Production Type	A Quantity of Food Produced (t)	B Emission Factor (kg NMVOC/t food processed)	C NMVOC Emitted (kg)	D NMVOC Emitted (Gg)
			C = (A x B)	D = C/1 000 000
Bread			0.00	0.00
Cakes,Biscuits and breakfast Cereals	371.1	1	371.10	0.00
Margarine,solid cooking fats	3472.25	10	34,722.50	0.03
Animal Feed			0.00	0.00
Meat, fish and poultry	920.4	0.3	276.12	0.00
			0.00	0.00
			0.00	0.00
			0.00	0.00
			Total (Gg):	0.04

This spreadsheet contains sheet 1 of Worksheet 2-14, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE		INDUSTRIAL PROCESSES			
SUBMODULE		PRODUCTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE			
WORKSHEET		2-14			
SHEET		1 OF 2 BY-PRODUCTS - HFCs AND PFCs EMISSIONS			
COUNTRY		St. Lucia			
YEAR		1994			
STEP 1					
Type of Halocarbon		A Quantity of Halocarbon Produced (t)	B Emission Factor (kg halocarbon by-product per tonne halocarbon produced)	C Halocarbon Emitted (kg)	D Halocarbon Emitted (Gg)
				C = (A x B)	D = C/1 000 000
HFCs				0.00	0.00
				0.00	0.00
				0.00	0.00
Total HFCs		**0.00**		**0.00**	**0.00**
PFCs				0.00	0.00
				0.00	0.00
				0.00	0.00
Total PFCs		**0.00**		**0.00**	**0.00**

This spreadsheet contains sheet 2 of Worksheet 2-14, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE		**INDUSTRIAL PROCESSES**			
SUBMODULE		**PRODUCTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE**			
WORKSHEET		**2-14**			
SHEET		**2 OF 2 FUGITIVE EMISSIONS - HFCs AND PFCs EMISSIONS**			
COUNTRY		**St. Lucia**			
YEAR		**1994**			
STEP 2					
Type of Halocarbon		A Quantity of Halocarbon Produced (t)	B Emission Factor (kg halocarbon lost per tonne halocarbon produced)	C Halocarbon Emitted (kg)	D Halocarbon Emitted (Gg)
				C = (A x B)	D = C/1 000 000
HFCs				0.00	0.00
				0.00	0.00
				0.00	0.00
Total HFCs		**0.00**		**0.00**	**0.00**
PFCs				0.00	0.00
				0.00	0.00
				0.00	0.00
Total PFCs		**0.00**		**0.00**	**0.00**

This spreadsheet contains sheet 1 of Worksheet 2-15, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE**
WORKSHEET	**2-15**
SHEET	**1 OF 13 - TIER 1a AND TIER 1b - BULK HALOCARBONS EMISSIONS**
HALOCARBON NAME	
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1					
	A Quantity of Halocarbon Produced (t)	B Quantity of Halocarbon Imported in Bulk (t)	C Quantity of Halocarbon Exported in Bulk (t)	D Quantity of Halocarbon Destroyed (t)	E Potential Bulk Halocarbon Emission (t)
					E = A + B - C - D
HFCs	0	15.4	0	0	15.40
PFCs					0.00

This spreadsheet contains sheet 2 of Worksheet 2-15, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE**
WORKSHEET	**2-15**
SHEET	**2 OF 13 - TIER 1b ONLY - PRODUCT CONTAINING HALOCARBONS**
HALOCARBON NAME	
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 2

Type of Product	F Number of Units Imported (+) or Exported (-)	G Quantity of Material per Unit (kg)	H Fraction of Halocarbon in Material (%/100)		I Potential Product Halocarbon Emissions (t)
					I = F x G x H/1000
Household Refrigerators	5942	0.2	HFCs	1	1.19
			PFCs		0.00
Other Stationary Equipment	42986	2	HFCs	0.95	81.67
			PFCs		0.00
Air Conditioning	4230	2	HFCs	1	8.46
			PFCs		0.00
			HFCs		0.00
			PFCs		0.00
			HFCs		0.00
			PFCs		0.00
			HFCs		0.00
			PFCs		0.00
				Total HFCs (Gg)	91.32
				Total PFCs (Gg)	0.00
				TOTAL (Gg)	91.32

This spreadsheet contains sheet 3 of Worksheet 2-15, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE		**INDUSTRIAL PROCESSES**		
SUBMODULE		**CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE - TIER 1a AND TIER 1b - SUMMARY OF HALOCARBONS EMISSIONS**		
WORKSHEET		**2-15**		
SHEET		**3 OF 13**		
HALOCARBON NAME				
COUNTRY		**St. Lucia**		
YEAR		**1994**		
STEP 3				
J Potential Bulk Halocarbon Emissions (t)		K Potential Product Halocarbon Emissions (t)	L Total Potential Halocarbon Emission (t)	M Total Potential Halocarbon Emissions (Gg)
J= E from Step 1		K= I from Step 2	L = J + K	M = L/1000
HFCs	15.40	91.32	106.72	0.11
PFCs	0.00	0.00	0.00	0.00

This spreadsheet contains sheet 4 of Worksheet 2-15, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE**
REFRIGERATION TYPE	
HALOCARBON NAME	
WORKSHEET	**2-15**
SHEET	**4 OF 13 REFRIGERATION ASSEMBLY - TIER 2 - HFCs AND PFCs EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 4

	A Amount of HFC/PFC Charged into New Systems in Year t ($E_{charged\ (t)}$) (t)	B Assembly Losses (k) (%)	C Halocarbon Emitted (t)	D Halocarbon Emitted (Gg)
			C= (A x B)/100	D = C/1000
HFCs	15.4	0.02	0.00308	0.00
PFCs			0.00000	0.00

This spreadsheet contains sheet 5 of Worksheet 2-15, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE		**INDUSTRIAL PROCESSES**		
SUBMODULE		**CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE**		
REFRIGERATION TYPE				
HALOCARBON NAME				
WORKSHEET		**2-15**		
SHEET		**5 OF 13 REFRIGERATION OPERATION - TIER 2 - HFCs AND PFCs EMISSIONS**		
COUNTRY		**St. Lucia**		
YEAR		**1994**		
STEP 5				
E Amount of HFC/PFC Stocked in Existing Systems in Year t ($E_{stock\ (t)}$) (t)		F Annual Leakage Rate (x) (%)	G Halocarbon Emitted (t)	H Halocarbon Emitted (Gg)
			G = E x F/100	H = G/1000
HFCs	15.4	17	2.62	0.00262
PFCs			0.00	0.00000

This spreadsheet contains sheet 6 of Worksheet 2-15, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**					
SUBMODULE	**CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE**					
REFRIGERATION TYPE						
HALOCARBON NAME						
WORKSHEET	**2-15**					
SHEET	**6 OF 13 REFRIGERATION DISPOSAL - TIER 2 - HFCs AND PFCs EMISSIONS**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
STEP 6						
	I Amount of HFC/PFC Charged into New Systems in Year t-n ($E_{charge\ (t-n)}$) (t)	J Average Equipment Lifetime (n) (years)	K Amount of HFC/PFC in Systems at Time of Disposal in Per Cent of Original Charge (y) (%)	L Amount of HFC/PFC Recovered in Per Cent of Actual Charge (z) (%)	M Halocarbon Emitted (t)	N Halocarbon Emitted (Gg)
					M = I x [K/100] x [(100 - L)/100]	N = M/1000
HFCs	15.4	15	80	10	11.09	1.33
PFCs					0.00	0.00

This spreadsheet contains sheet 7 of Worksheet 2-15, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	INDUSTRIAL PROCESSES			
SUBMODULE	CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE			
REFRIGERATION TYPE				
HALOCARBON NAME				
WORKSHEET	2-15			
SHEET	7 OF 13 REFRIGERATION SUMMARY - TIER 2 - HFCs AND PFCs EMISSIONS			
COUNTRY	St. Lucia			
YEAR	1994.00000			

STEP 7				
	O Assembly (Gg)	P Operation (Gg)	Q Disposal (Gg)	R Total Halocarbon Emissions (Gg)
	O = D (from Step 4)	P = H (from Step 5)	Q = N (from Step 6)	R =(O+P+Q)
HFCs	0.0000031	0.00262	1.33	1.34
PFCs	0.0000000	0.00000	0.00	0.00

This spreadsheet contains sheet 8 of Worksheet 2-15, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**						
SUBMODULE	**CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE**						
WORKSHEET	**2-15**						
SHEET	**8 OF 13 FOAM PRODUCTS - TIER 2 - HFCs AND PFCs EMISSIONS**						
COUNTRY	**St. Lucia**						
YEAR	**1994**						
STEP 8							
Foam Type		A Quantity of HFC/PFC Used (t)	B Quantity of HFC/PFC in Use (t)	C Fraction Loss during Production (%/100)	D Fraction Loss during Use (%/100)	E HFC/PFC Emitted (t)	F HFC/PFC Emitted (Gg)
						E = (A x C) + (B x D)	F = E/1000
Open	HFCs		NA		NA	0.00	0.00
	PFCs		NA		NA	0.00	0.00
Closed	HFCs					0.00	0.00
	PFCs					0.00	0.00
NA= Not Applicable						**Total (Gg):**	0.00

This spreadsheet contains sheet 9 of Worksheet 2-15, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE**
WORKSHEET	**2-15**
SHEET	**9 OF 13 FIRE EXTINGUISHERS - TIER 2 - HFCs, PFCs AND SF_6 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 9

Extinguisher Type		A Total Quantity of $HFC/PFC/SF_6$ Used in New Extinguishers (t)	B Fractional Loss Factor (%/100)	C $HFC/PFC/SF_6$ Emitted (t)	D $HFC/PFC/SF_6$ Emitted (Gg)
				C = (A x B)	D = C/1000
Portable	HFCs			0.00	0.00
	PFCs			0.00	0.00
	SF_6			0.00	0.00
Fixed	HFCs	0.39	0.01	0.00	0.00
	PFCs			0.00	0.00
	SF_6			0.00	0.00

This spreadsheet contains sheet 10 of Worksheet 2-15, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**				
SUBMODULE	**CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE**				
WORKSHEET	**2-15**				
SHEET	**10 OF 13 - TIER 2 - AEROSOLS - HFCs AND PFCs EMISSIONS**				
COUNTRY	**St. Lucia**				
YEAR	**1994**				
STEP 10					
	A Use of HFCs/PFCs for Aerosols in Inventory Year (t)	B Use of HFCs/ PFCs for Aerosols in Prior Year (t)	C Loss of Current Year’s Use	D Emission of HFCs/PFCs from Aerosols (t)	E Emission of HFCs/PFCs from Aerosols (Gg)
				D = (A x C) + B (1 - C)	E = D/1000
HFCs				0.00	0.00
PFCs				0.00	0.00

This spreadsheet contains sheet 11 of Worksheet 2-15, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	INDUSTRIAL PROCESSES				
SUBMODULE	CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE				
WORKSHEET	2-15				
SHEET	11 OF 13 SOLVENTS - TIER 2 - HFCs AND PFCs EMISSIONS				
COUNTRY	St. Lucia				
YEAR	1994				
STEP 11					
	A Use of HFCs/PFCs for Solvents in Inventory Year (t)	B Use of HFCs/ PFCs for Solvents in Prior Year (t)	C Loss of Current Year's Use	D Emission of HFCs/PFCs from Solvents (t)	E Emission of HFCs/PFCs from Solvents (Gg)
				D = (A x C) + B (1 - C)	E = D/1000
HFCs				0.00	0.00
PFCs				0.00	0.00

This spreadsheet contains sheet 12 of Worksheet 2-15, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**				
SUBMODULE	**CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE**				
WORKSHEET	**2-15**				
SHEET	**12 OF 13 OTHER APPLICATIONS - TIER 2 - HFCs AND PFCs EMISSIONS**				
COUNTRY	**St. Lucia**				
YEAR	**1994**				
STEP 12					
	A Use of HFCs/PFCs for Other Applications in Inventory Year (t)	B Use of HFCs/ PFCs for Other Applications in Prior Year (t)	C Loss of Current Year's Use	D Emission of HFCs/PFCs from Other Applications (t)	E Emission of HFCs/PFCs from Other Applications (Gg)
				D = (A x C) + B (1 - C)	E = D/1000
HFCs				0.00	0.00
PFCs				0.00	0.00

This spreadsheet contains sheet 13 of Worksheet 2-15, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**INDUSTRIAL PROCESSES**
SUBMODULE	**CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE**
WORKSHEET	**2-15**
SHEET	**13 OF 13 SF_6 EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 13

A	B	C	D	E	F
Quantity of SF_6 in Use in Inventory Year (t)	Loss Factor for SF_6 in Use (%/100)	Quantity of SF_6 in Use 30 Years Prior to the Inventory Year (t)	Fraction Remaining in SF_6 Equipment at Time of Disposal (%/100)	SF_6 Emitted (t)	SF_6 Emitted (Gg)
				E = (A x B) + (C x D)	F = E/1000
				0.00	0.00

This spreadsheet contains sheet 1 of Worksheet 4-1, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**					
SUBMODULE	**METHANE AND NITROUS OXIDE EMISSIONS FROM DOMESTIC LIVESTOCK ENTERIC FERMENTATION AND MANURE MANAGEMENT**					
WORKSHEET	**4-1**					
SHEET	**1 OF 2 METHANE EMISSIONS FROM DOMESTIC LIVESTOCK ENTERIC FERMENTATION AND MANURE MANAGEMENT**					
COUNTRY	**St. Lucia**					
YEAR	**1994**					
	STEP 1			**STEP 2**		**STEP 3**
Livestock Type	A Number of Animals (1000s)	B Emissions Factor for Enteric Fermentation (kg/head/yr)	C Emissions from Enteric Fermentation (t/yr)	D Emissions Factor for Manure Management (kg/head/yr)	E Emissions from Manure Management (t/yr)	F Total Annual Emissions from Domestic Livestock (Gg)
			C = (A x B)		E = (A x D)	F =(C + E)/1000
Dairy Cattle	3.667	57	209.02	2	7.33	0.22
Non-dairy Cattle	3.297	49	161.55	1	3.30	0.16
Buffalo	0		0.00		0.00	0.00
Sheep	1.248	5	6.24	0.21	0.26	0.01
Goats	9.714	5	48.57	0.22	2.14	0.05
Camels	0		0.00		0.00	0.00
Horses	0.246	18	4.43	2.18	0.54	0.00
Mules & Asses	0		0.00		0.00	0.00
Swine	14.658	1	14.66	2	29.32	0.04
Poultry	100	0.005	0.50	0.023	2.30	0.00
Totals			**444.97**		**45.18**	**0.49**

This spreadsheet contains Worksheet 4-1 (supplemental), in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**METHANE AND NITROUS OXIDE EMISSIONS FROM DOMESTIC LIVESTOCK ENTERIC FERMENTATION AND MANURE MANAGEMENT**
WORKSHEET	**4-1 (SUPPLEMENTAL)**
SPECIFY AWMS	**ANAEROBIC LAGOONS**
SHEET	**NITROGEN EXCRETION FOR ANIMAL WASTE MANAGEMENT SYSTEM**
COUNTRY	**St. Lucia**
YEAR	**1994**

Livestock Type	A Number of Animals (# of animals)	B Nitrogen Excretion Nex (kg//head/(yr)	C Fraction of Manure Nitrogen per AWMS (%/100) (fraction)	D Nitrogen Excretion per AWMS, Nex (kg/N/yr)
				D = (A x B x C)
Non-dairy Cattle				0.00
Dairy Cattle				0.00
Poultry				0.00
Sheep				0.00
Swine				0.00
Others				0.00
			TOTAL	0.00

This spreadsheet contains Worksheet 4-1 (supplemental), in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**METHANE AND NITROUS OXIDE EMISSIONS FROM DOMESTIC LIVESTOCK ENTERIC FERMENTATION AND MANURE MANAGEMENT**
WORKSHEET	**4-1 (SUPPLEMENTAL)**
SPECIFY AWMS	**LIQUID SYSTEMS**
SHEET	**NITROGEN EXCRETION FOR ANIMAL WASTE MANAGEMENT SYSTEM**
COUNTRY	**St. Lucia**
YEAR	**1994**

Livestock Type	A Number of Animals (1000s)	B Nitrogen Excretion Nex (kg//head/(yr)	C Fraction of Manure Nitrogen per AWMS (%/100) (fraction)	D Nitrogen Excretion per AWMS, Nex (kg/N/yr)
				D = (A x B x C)
Non-dairy Cattle				0.00
Dairy Cattle				0.00
Poultry				0.00
Sheep				0.00
Swine				0.00
Others				0.00
			TOTAL	0.00

This spreadsheet contains Worksheet 4-1 (supplemental), in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**METHANE AND NITROUS OXIDE EMISSIONS FROM DOMESTIC LIVESTOCK ENTERIC FERMENTATION AND MANURE MANAGEMENT**
WORKSHEET	**4-1 (SUPPLEMENTAL)**
SPECIFY AWMS	**SOLID STORAGE AND DRYLOT**
SHEET	**NITROGEN EXCRETION FOR ANIMAL WASTE MANAGEMENT SYSTEM**
COUNTRY	**St. Lucia**
YEAR	**1994**

Livestock Type	A Number of Animals (1000s)	B Nitrogen Excretion Nex (kg//head/(yr)	C Fraction of Manure Nitrogen per AWMS (%/100) (fraction)	D Nitrogen Excretion per AWMS, Nex (kg/N/yr)
				D = (A x B x C)
Non-dairy Cattle				0.00
Dairy Cattle				0.00
Poultry				0.00
Sheep				0.00
Swine				0.00
Others				0.00
			TOTAL	0.00

This spreadsheet contains Worksheet 4-1 (supplemental), in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**METHANE AND NITROUS OXIDE EMISSIONS FROM DOMESTIC LIVESTOCK ENTERIC FERMENTATION AND MANURE MANAGEMENT**
WORKSHEET	**4-1 (SUPPLEMENTAL)**
SPECIFY AWMS	**DAILY SPREAD**
SHEET	**NITROGEN EXCRETION FOR ANIMAL WASTE MANAGEMENT SYSTEM**
COUNTRY	**St. Lucia**
YEAR	**1994**

Livestock Type	A Number of Animals (1000s)	B Nitrogen Excretion Nex (kg//head/(yr)	C Fraction of Manure Nitrogen per AWMS (%/100) (fraction)	D Nitrogen Excretion per AWMS, Nex (kg/N/yr)
				D = (A x B x C)
Non-dairy Cattle				0.00
Dairy Cattle				0.00
Poultry				0.00
Sheep				0.00
Swine	14658	9.125	1	133,754.25
Others				0.00
			TOTAL	**133,754.25**

This spreadsheet contains Worksheet 4-1 (supplemental), in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**METHANE AND NITROUS OXIDE EMISSIONS FROM DOMESTIC LIVESTOCK ENTERIC FERMENTATION AND MANURE MANAGEMENT**
WORKSHEET	**4-1 (SUPPLEMENTAL)**
SPECIFY AWMS	**PASTURE RANGE AND PADDOCK**
SHEET	**NITROGEN EXCRETION FOR ANIMAL WASTE MANAGEMENT SYSTEM**
COUNTRY	**St. Lucia**
YEAR	**1994**

Livestock Type	A Number of Animals (1000s)	B Nitrogen Excretion Nex (kg//head/(yr)	C Fraction of Manure Nitrogen per AWMS (%/100) (fraction)	D Nitrogen Excretion per AWMS, Nex (kg/N/yr)
				D = (A x B x C)
Non-dairy Cattle	3297	23.725	0.1831	14,322.32
Dairy Cattle	3667	23.725	0.1793	15,599.02
Poultry	100000	0.438	0.1055	4,620.90
Sheep	10962	10.22	0.5198	58,234.05
Swine				0.00
Others	246	25.55	0.0144	90.51
			TOTAL	**92,866.80**

This spreadsheet contains Worksheet 4-1 (supplemental), in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**METHANE AND NITROUS OXIDE EMISSIONS FROM DOMESTIC LIVESTOCK ENTERIC FERMENTATION AND MANURE MANAGEMENT**
WORKSHEET	**4-1 (SUPPLEMENTAL)**
SPECIFY AWMS	**OTHER**
SHEET	**NITROGEN EXCRETION FOR ANIMAL WASTE MANAGEMENT SYSTEM**
COUNTRY	**St. Lucia**
YEAR	**1994**

Livestock Type	A Number of Animals (1000s)	B Nitrogen Excretion Nex (kg//head/(yr)	C Fraction of Manure Nitrogen per AWMS (%/100) (fraction)	D Nitrogen Excretion per AWMS, Nex (kg/N/yr)
				D = (A x B x C)
Non-dairy Cattle				0.00
Dairy Cattle				0.00
Poultry				0.00
Sheep				0.00
Swine				0.00
Others				0.00
			TOTAL	0.00

This spreadsheet contains sheet 2 of Worksheet 4-1, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**		
SUBMODULE	**METHANE AND NITROUS OXIDE EMISSIONS FROM DOMESTIC LIVESTOCK ENTERIC FERMENTATION AND MANURE MANAGEMENT**		
WORKSHEET	**4-1**		
SHEET	**2 OF 2 NITROUS OXIDE EMISSIONS FROM ANIMAL PRODUCTION EMISSIONS FROM ANIMAL WASTE MANAGEMENT SYSTEMS (AWMS)**		
COUNTRY	**St. Lucia**		
YEAR	**1994.00000**		
	STEP 4		
Animal Waste Management System (AWMS)	A Nitrogen Excretion $Nex_{(AWMS)}$ (kg N/yr)	B Emission Factor For AWMS EF_3 (kg N_2O–N/kg N)	C Total Annual Emissions of N_2O (Gg)
			C=(AxB)[44/28] / 1 000 000
Anaerobic lagoons	0.00000		0.00
Liquid systems	0.00000		0.00
Daily spread	133754.25000		
Solid storage & drylot	0.00000		0.00
Pasture range and paddock	92866.80320		
Other	0.00000		0.00
Total	226621.05320	**Total**	0.00

This spreadsheet contains Worksheet 4-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**METHANE EMISSIONS FROM FLOODED RICE FIELDS**
WORKSHEET	**4-2**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994.00000**

Water Management Regime			A Harvested Area (m^2 /1 000 000	B Scaling Factor for Methane Emissions	C Correction Factor for Organic Amendment	D Seasonally Integrated Emission Factor for Continuously Flooded Rice without Organic Amendment (g/m^2)	E CH_4 Emissions (Gg)
							E = (A x B x C x D)
Irrigated	Continuously Flooded		0.00002	1	2	20	0.00080
	Intermittently Flooded	Single Aeration					0.00000
		Multiple Aeration					0.00000
Rainfed	Flood Prone						0.00000
	Drought Prone						0.00000
Deep Water	Water Depth 50-100 cm						0.00000
	Water Depth > 100 cm						0.00000
Totals			**0.00002**				**0.00080**

This spreadsheet contains sheet 1 of Worksheet 4-3, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

	MODULE	AGRICULTURE					
	SUBMODULE	PRESCRIBED BURNING OF SAVANNAS					
	WORKSHEET	4-3					
	SHEET	1 OF 3					
	COUNTRY	St. Lucia					
	YEAR	1994					
STEP 1					STEP 2		
A Area Burned by Category (specify) (k ha)	B Biomass Density of Savanna (t dm/ha)	C Total Biomass Exposed to Burning (Gg dm)	D Fraction Actually Burned	E Quantity Actually Burned (Gg dm)	F Fraction of Living Biomass Burned	G Quantity of Living Biomass Burned (Gg dm)	H Quantity of Dead Biomass Burned (Gg dm)
		C = (A x B)		E = (C x D)		G = (E x F)	H = (E - G)
		0.00		0.00		0.00	
							0.00
		0.00		0.00		0.00	
							0.00
		0.00		0.00		0.00	
							0.00
		0.00		0.00		0.00	
							0.00
		0.00		0.00		0.00	
							0.00
		0.00		0.00		0.00	
							0.00
		0.00		0.00		0.00	
							0.00

This spreadsheet contains sheet 2 of Worksheet 4-3, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE		AGRICULTURE		
SUBMODULE		PRESCRIBED BURNING OF SAVANNAS		
WORKSHEET		4-3		
SHEET		2 OF 3		
COUNTRY		St. Lucia		
YEAR		1994		
STEP 3				
I Fraction Oxidised of living and dead biomass		J Total Biomass Oxidised (Gg dm)	K Carbon Fraction of Living & Dead Biomass	L Total Carbon Released (Gg C)
		Living: J = (G x I) *Dead:* J = (H x I)		L = (J x K)
Living		0.00		0.00
Dead		0.00		0.00
Living		0.00		0.00
Dead		0.00		0.00
Living		0.00		0.00
Dead		0.00		0.00
Living		0.00		0.00
Dead		0.00		0.00
Living		0.00		0.00
Dead		0.00		0.00
Living		0.00		0.00
Dead		0.00		0.00
Living		0.00		0.00
Dead		0.00		0.00
Total				0.00

This spreadsheet contains sheet 3 of Worksheet 4-3, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

		MODULE	AGRICULTURE				
		SUBMODULE	PRESCRIBED BURNING OF SAVANNAS				
		WORKSHEET	4-3				
		SHEET	3 OF 3				
		COUNTRY	St. Lucia				
		YEAR	1994				
STEP 4					STEP 5		
L Total Carbon Released (Gg C)	M Nitrogen-Carbon Ratio	N Total Nitrogen Content (Gg N)	O Emissions Ratio	P Emissions (Gg C **or** Gg N)	Q Conversion Ratio	R Emissions from Savanna Burning (Gg)	
		N = (L x M)		P = (L x O)		R = (P x Q)	
				0.00	16/12	*CH_4*	0.00
				0.00	28/12	*CO*	0.00
0.00		0.00		P = (N x O)		R = (P x Q)	
				0.00	44/28	*N_2O*	0.00
				0.00	46/14	*NO_x*	0.00

This spreadsheet contains sheet 1 of Worksheet 4-4, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

		MODULE	AGRICULTURE					
		SUBMODULE	FIELD BURNING OF AGRICULTURAL RESIDUES					
		WORKSHEET	4-4					
		SHEET	1 OF 3					
		COUNTRY	St. Lucia					
		YEAR	1994					
	STEP 1			STEP 2		STEP 3		
Crops (specify locally important crops)	A Annual Production (Gg crop)	B Residue to Crop Ratio	C Quantity of Residue (Gg biomass)	D Dry Matter Fraction	E Quantity of Dry Residue (Gg dm)	F Fraction Burned in Fields	G Fraction Oxidised	H Total Biomass Burned (Gg dm)
			C = (A x B)		E = (C x D)			H = (E x F xG)
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
.			0.00		0.00			0.00
Total:								0.00

This spreadsheet contains sheet 2A of Worksheet 4-4, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	AGRICULTURE
SUBMODULE	FIELD BURNING OF AGRICULTURAL RESIDUES
WORKSHEET	4-4
SHEET	2 OF 3
COUNTRY	St. Lucia
YEAR	1994

	STEP 4		STEP 5	
Crops	I Carbon Fraction of Residue	J Total Carbon Released (Gg C)	K Nitrogen- Carbon Ratio	L Total Nitrogen Released (Gg N)
		J = (H x I)		L = (J x K)
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
.		0.00		0.00
Total:		0.00		0.00

This spreadsheet contains sheet 3 of Worksheet 4-4, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**			
SUBMODULE	**FIELD BURNING OF AGRICULTURAL RESIDUES**			
WORKSHEET	**4-4**			
SHEET	**3 OF 3**			
COUNTRY	**St. Lucia**			
YEAR	**1994**			
STEP 6				
	M Emission Ratio	N Emissions (Gg C **or** Gg N)	O Conversion Ratio	P Emissions from Field Burning of Agricultural Residues (Gg)
		N = (J x M)		P = (N x O)
CH_4		0.00	16/12	0.00
CO		0.00	28/12	0.00
		N = (L x M)		P = (N x O)
N_2O		0.00	44/28	0.00
NO_x		0.00	46/14	0.00

This spreadsheet contains sheet 1 of Worksheet 4-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**AGRICULTURAL SOILS**
WORKSHEET	**4-5**
SHEET	**1 OF 5 DIRECT NITROUS OXIDE EMISSIONS FROM AGRICULTURAL FIELDS, EXCLUDING CULTIVATION OF HISTOSOLS**
COUNTRY	**St. Lucia**
YEAR	**1994**

	STEP 1	**STEP 2**	
Type of N input to soil	A Amount of N Input (kg N/yr)	B Factor for Direct Emissions EF_1 (kg N_2O–N/kg N)	C Direct Soil Emissions (Gg N_2O-N/yr)
			C = (A x B)/1 000 000
Synthetic fertiliser (F_{SN})	922,981.50	0.0125	0.01154
Animal waste (F_{AW})	180,843.60	0.0125	0.0022605
N-fixing crops (F_{BN})			0.00000
Crop residue (F_{CR})	309,000.00	0.0125	0.00386
		Total	0.01766

This spreadsheet contains Worksheet 4-5A (supplemental), in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**AGRICULTURAL SOILS**
WORKSHEET	**4-5A (SUPPLEMENTAL)**
SHEET	**1 OF 1 MANURE NITROGEN USED**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Total Nitrogen Excretion (kg N/yr)	B Fraction of Nitrogen Burned for Fuel (fraction)	C Fraction of Nitrogen Excreted During Grazing (fraction)	D Fraction of Nitrogen Excreted Emitted as NO_X and NH_3 (fraction)	E Sum (fraction)	F Manure Nitrogen Used (corrected for NO_X and NH_3 emissions), F_{AW} (kg N/yr)
				F = 1 - (B + C + D)	F = (A x E)
226,621.05	0	0.002	0.2	0.80	180,843.60

This spreadsheet contains Worksheet 4-5B (supplemental), in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**AGRICULTURAL SOILS**
WORKSHEET	**4-5B (SUPPLEMENTAL)**
SHEET	**1 OF 1 NITROGEN INPUT FROM CROP RESIDUES**
COUNTRY	**St. Lucia**
YEAR	**1994**

A	B	C	D	E	F	G
Production of non - N - Fixing Crops (kg dry biomass/yr)	Fraction of Nitrogen of non - N - Fixing Crops, (kg N/kg dry biomass)	Production of Pulses and Soybeans (kg dry biomass/yr)	Fraction of Nitrogen in N-Fixing Crops, (kg N/kg dry biomass)	One minus the Fraction of Crop Residue Removed From Field, (fraction)	One minus the Fraction of Crop Residue Burned (fraction)	Nitrogen Input from Crop Residues, F_{CR} (kg N/yr)
						G = 2 x (A x B + C x D) x E x F
10000000	0.015	150000	0.03	1	1	309,000.00

This spreadsheet contains sheet 2 of Worksheet 4-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**AGRICULTURAL SOILS**
WORKSHEET	**4-5**
SHEET	**2 OF 5 DIRECT NITROUS OXIDE EMISSIONS FROM CULTIVATION OF HISTOSOLS**
COUNTRY	**St. Lucia**
YEAR	**1994**

	STEP 3			**STEP 4**
	D Area of Cultivated Organic Soils F_{OS} (ha)	E Emission Factor for Direct Soil Emissions EF_2 (kg N_2O–N/ha/yr)	F Direct Emissions from Histosols (Gg N_2O–N/yr)	G Total Direct Emissions of N_2O (Gg)
			F=(D x E)/1 000 000	G = (C+F)[44/28]
Subtotal	1	10	0.00001	0.02777

This spreadsheet contains sheet 3 of Worksheet 4-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**AGRICULTURAL SOILS**
WORKSHEET	**4-5**
SHEET	**3 OF 5 NITROUS OXIDE SOIL EMISSIONS FROM GRAZING ANIMALS - PASTURE RANGE AND PADDOCK**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 5			
Animal Waste Management System (AWMS)	A Nitrogen Excretion $Nex_{(AWMS)}$ (kg N/yr)	B Emission Factor for AWMS EF_3 (kg N_2O–N/kg N)	C Emissions Of N_2O from Grazing Animals (Gg)
			C = (A x B)[44/28]/1 000 000
Pasture range & paddock	92,866.80	0.02	0.0029187

This spreadsheet contains sheet 4 of Worksheet 4-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**
SUBMODULE	**AGRICULTURAL SOILS**
WORKSHEET	**4-5**
SHEET	**4 OF 5 INDIRECT NITROUS OXIDE EMISSIONS FROM ATMOSPHERIC DEPOSITION OF NH_3 AND NO_X**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 6

Type of Deposition	A Synthetic Fertiliser N Applied to Soil, N_{FERT} (kg N/yr)	B Fraction of Synthetic Fertiliser N Applied that Volatilizes $Frac_{GASFS}$ (kg N/kg N)	C Amount of Synthetic N Applied to Soil that Volatilizes (kg N/kg N)	D Total N Excretion by Livestock N_{EX} (kg N/yr)	E Fraction of Total Manure N Excreted that Volatilizes $Frac_{GASM}$ (kg N/kg N)	F Total N Excretion by Livestock that Volatilizes (kg N/kg N)	G Emission Factor EF_4 (kg N_2O–N/kg N)	H Nitrous Oxide Emissions (Gg N_2O–N/yr)
			C = (A x B)			F = (D x E)		H = (C + F) x G /1 000 000
Total	1025535	0.1	102,553.50	226,621.05	0.2	45,324.21	0.01	0.00148

This spreadsheet contains sheet 5 of Worksheet 4-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**AGRICULTURE**						
SUBMODULE	**AGRICULTURAL SOILS**						
WORKSHEET	**4-5**						
SHEET	**5 OF 5 INDIRECT NITROUS OXIDE EMISSIONS FROM LEACHING**						
COUNTRY	**St. Lucia**						
YEAR	**1994**						
	STEP 7					**STEP 8**	**STEP 9**
	I Synthetic Fertiliser Use N_{FERT} (kg N/yr)	J Livestock N Excretion N_{EX} (kg N/yr)	K Fraction of N That Leaches $Frac_{LEACH}$ (kg N/kg N)	L Emission Factor EF_5	M Nitrous Oxide Emissions From Leaching ($Gg N_2O$–N/yr)	N Total Indirect Nitrous Oxide Emissions ($Gg N_2O$/yr)	O Total Nitrous Oxide Emissions (Gg)
					M = (I + J) x K x L/1 000 000	N = (H + M)[44/28]	O = (G + C + N) (G from Worksheet 4-5, sheet 2, Step 4; C from Worksheet 4-5, sheet 3, Step 5; N from Worksheet 4-5, sheet 5, Step 8).
Total	1,025,535.00	226,621.05	0.3	0.025	0.01	0.02	0.05

This spreadsheet contains sheet 1 of Worksheet 5-1, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE			**LAND USE CHANGE AND FORESTRY**				
SUBMODULE			**CHANGES IN FOREST AND OTHER WOODY BIOMASS STOCKS**				
WORKSHEET			**5-1**				
SHEET			**1 OF 3**				
COUNTRY			**St. Lucia**				
YEAR			**1994**				
			STEP 1				
			A Area of Forest/Biomass Stocks (kha)	B Annual Growth Rate (t dm/ha)	C Annual Biomass Increment (kt dm)	D Carbon Fraction of Dry Matter	E Total Carbon Uptake Increment (kt C)
					C=(A x B)		E=(C x D)
Tropical	Plantations	*Acacia spp.*			0.00		0.00
		Eucalyptus spp.			0.00		0.00
		Tectona grandis			0.00		0.00
		Pinus spp			0.00		0.00
		Pinus caribaea			0.00		0.00
		Mixed Hardwoods	0.48	6.8	3.26	0.5	1.63
		Mixed Fast-Growing Hardwoods			0.00		0.00
		Mixed Softwoods			0.00		0.00
	Other Forests	Moist	12.444	6.8	84.62	0.5	42.31
		Seasonal	8.82	4	35.28	0.5	17.64
		Dry		4	0.00	0.5	0.00
	Other (specify)		39.756	4	159.02	0.5	79.51
Temperate	Plantations	Douglas fir			0.00		0.00
		Loblolly pine			0.00		0.00
	Commercial	Evergreen			0.00		0.00
		Deciduous			0.00		0.00
	Other				0.00		0.00
Boreal					0.00		0.00
Non-Forest Trees (specify type)			A Number of Trees (1000s of trees)	B Annual Growth Rate (kt dm/1000 trees)			
				0.008	0.00	0.5	0.00
					0.00		0.00
						Total	**141.09**

This spreadsheet contains sheet 2 of Worksheet 5-1, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**LAND USE CHANGE AND FORESTRY**
SUBMODULE	**CHANGES IN FOREST AND OTHER WOODY BIOMASS STOCKS**
WORKSHEET	**5-1**
SHEET	**2 OF 3**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 2

Harvest Categories (specify)	F Commercial Harvest (if applicable) (1000 m^3 roundwood)	G Biomass Conversion/ Expansion Ratio (if applicable) (t dm/m^3)	H Total Biomass Removed in Commercial Harvest (kt dm)	I Total Traditional Fuelwood Consumed (kt dm)	J Total Other Wood Use (kt dm)	K Total Biomass Consumption (kt dm)	L Wood Removed From Forest Clearing (kt dm)	M Total Biomass Consumption From Stocks (kt dm)
			H = (F x G)	FAO data		K = (H + I + J)	(From column M, Worksheet 5-2, sheet 3)	M = K - L
Mixed Harwoods	1.2	0.5	0.60	0.1	0	0.70		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
			0.00			0.00		
Totals	1.20		0.60	0.10	0.00	0.70	0.00	0.70

This spreadsheet contains sheet 3 of Worksheet 5-1, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**LAND USE AND FORESTRY**
SUBMODULE	**CHANGES IN FOREST AND OTHER WOODY BIOMASS STOCKS**
WORKSHEET	**5-1**
SHEET	**3 OF 3**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 3		**STEP 4**	
N Carbon Fraction	O Annual Carbon Release (kt C)	P Net Annual Carbon Uptake (+) or Release (-) (kt C)	Q Convert to CO_2 Annual Emission (-) or Removal (+) (Gg CO_2)
	O = (M x N)	P = (E - O)	Q = (P x [44/12])
0.5	0.35	140.74	516.06

This spreadsheet contains sheet 1 of Worksheet 5-2, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**FOREST AND GRASSLAND CONVERSION - CO_2 FROM BIOMASS**
WORKSHEET	**5-2**
SHEET	**1 OF 5 BIOMASS CLEARED**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1

Vegetation types		A Area Converted Annually (kha)	B Biomass Before Conversion (t dm/ha)	C Biomass After Conversion (t dm/ha)	D Net Change in Biomass Density (t dm/ha)	E Annual Loss of Biomass (kt dm)
					D = (B - C)	E = (A x D)
Tropical	Wet/Very Moist				0.00	0.00
	Moist, short dry season	0.5	175	10	165.00	82.50
	Moist, long dry season				0.00	0.00
	Dry				0.00	0.00
	Montane Moist				0.00	0.00
	Montane Dry				0.00	0.00
Tropical Savanna/Grasslands					0.00	0.00
Temperate	Coniferous				0.00	0.00
	Broadleaf				0.00	0.00
Grasslands					0.00	0.00
Boreal	Mixed Broadleaf/ Coniferous				0.00	0.00
	Coniferous				0.00	0.00
	Forest-tundra				0.00	0.00
Grasslands/Tundra					0.00	0.00
Other					0.00	0.00
Subtotals		0.50			165.00	82.50

This spreadsheet contains sheet 2 of Worksheet 5-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

	MODULE	LAND-USE CHANGE AND FORESTRY					
	SUBMODULE	FOREST AND GRASSLAND CONVERSION - CO_2 FROM BIOMASS					
	WORKSHEET	5-2					
	SHEET	2 OF 5 CARBON RELEASED BY ON-SITE BURNING					
	COUNTRY	St. Lucia					
	YEAR	1994					
		STEP 2					
Vegegation types		F Fraction of Biomass Burned on Site	G Quantity of Biomass Burned on Site (kt dm)	H Fraction of Biomass Oxidised on Site	I Quantity of Biomass Oxidised on Site (kt dm)	J Carbon Fraction of Above-ground Biomass (burned on site)	K Quantity of Carbon Released (from biomass burned) (kt C)
			G = (E x F)		I = (G x H)		K = (I x J)
Tropical	Wet/Very Moist		0.00		0.00		0.00
	Moist, short dry season	0.5	41.25	0.9	37.13	0.5	18.56
	Moist, long dry season		0.00		0.00		0.00
	Dry		0.00	0.9	0.00	0.5	0.00
	Montane Moist		0.00		0.00		0.00
	Montane Dry		0.00		0.00		0.00
Tropical Savanna/Grasslands			0.00		0.00		0.00
Temperate	Coniferous		0.00		0.00		0.00
	Broadleaf		0.00		0.00		0.00
Grasslands			0.00		0.00		0.00
Boreal	Mixed Broadleaf/Coniferous		0.00		0.00		0.00
	Coniferous		0.00		0.00		0.00
	Forest-tundra		0.00		0.00		0.00
Grasslands/Tundra			0.00		0.00		0.00
Other			0.00		0.00		0.00
						Subtotal	18.56

This spreadsheet contains sheet 3 of Worksheet 5-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE		**LAND-USE CHANGE AND FORESTRY**						
SUBMODULE		**FOREST AND GRASSLAND CONVERSION - CO_2 FROM BIOMASS**						
WORKSHEET		**5-2**						
SHEET		**3 OF 5 CARBON RELEASED BY OFF-SITE BURNING**						
COUNTRY		**St. Lucia**						
YEAR		**1994**						
		STEP 3						**STEP 4**
Vegetation types		L Fraction of Biomass Burned off Site	M Quantity of Biomass Burned off Site (kt dm)	N Fraction of Biomass Oxidised off Site	O Quantity of Biomass Oxidised off Site (kt dm)	P Carbon Fraction of Above-ground Biomass (burned off site)	Q Quantity of Carbon Released (from biomass burned off site) (kt C)	R Total Carbon Released (from on and off site burning) (kt C)
			M = (E x L)		O = (M x N)		Q = (O x P)	R = (K + Q)
Tropical	Wet/Very Moist		0.00		0.00		0.00	0.00
	Moist, short dry season	0	0.00	0.9	0.00	0.5	0.00	18.56
	Moist, long dry season		0.00		0.00		0.00	0.00
	Dry	0	0.00	0.9	0.00	0.5	0.00	0.00
	Montane Moist		0.00		0.00		0.00	0.00
	Montane Dry		0.00		0.00		0.00	0.00
Tropical Savanna/Grasslands			0.00		0.00		0.00	0.00
Temperate	Coniferous		0.00		0.00		0.00	0.00
	Broadleaf		0.00		0.00		0.00	0.00
Grasslands			0.00		0.00		0.00	0.00
Boreal	Mixed Broadleaf/ Coniferous		0.00		0.00		0.00	0.00
	Coniferous		0.00		0.00		0.00	0.00
	Forest- tundra		0.00		0.00		0.00	0.00
Grasslands/Tundra			0.00		0.00		0.00	0.00
Other			0.00		0.00		0.00	0.00
		Subtotals	0.00				0.00	18.56

This spreadsheet contains sheet 4 of Worksheet 5-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**FOREST AND GRASSLAND CONVERSION - CO_2 FROM BIOMASS**
WORKSHEET	**5-2**
SHEET	**4 OF 5 CARBON RELEASED BY DECAY OF BIOMASS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 5

Vegetation types		A Average Area Converted (10 Year Average) (kha)	B Biomass Before Conversion (t dm/ha)	C Biomass After Conversion (t dm/ha)	D Net Change in Biomass Density (t dm/ha)	E Average Annual Loss of Biomass (kt dm)	F Fraction Left to Decay	G Quantity of Biomass Left to Decay (kt dm)	H Carbon Fraction in Above-ground Biomass	I Carbon Released from Decay of Above-ground Biomass (kt C)
					D = (B-C)	E = (A x D)		G = (E x F)		I = (G x H)
Tropical	Wet/Very Moist				0.00	0.00		0.00		0.00
	Moist, short dry season				0.00	0.00		0.00	0.5	0.00
	Moist, long dry season				0.00	0.00		0.00		0.00
	Dry				0.00	0.00		0.00	0.5	0.00
	Montane Moist				0.00	0.00		0.00		0.00
	Montane Dry				0.00	0.00		0.00		0.00
Tropical Savanna/Grasslands					0.00	0.00		0.00		0.00
Temperate	Coniferous				0.00	0.00		0.00		0.00
	Broadleaf				0.00	0.00		0.00		0.00
Grasslands					0.00	0.00		0.00		0.00
Boreal	Mixed Broadleaf/ Coniferous				0.00	0.00		0.00		0.00
	Coniferous				0.00	0.00		0.00		0.00
	Forest-tundra				0.00	0.00		0.00		0.00
Grasslands/Tundra					0.00	0.00		0.00		0.00
Other					0.00	0.00		0.00		0.00
									Subtotal	0.00

This spreadsheet contains sheet 5 of Worksheet 5-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**FOREST AND GRASSLAND CONVERSION - CO_2 FROM BIOMASS**
WORKSHEET	**5-2**
SHEET	**5 OF 5 SUMMARY AND CONVERSION TO CO_2**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 6

A Immediate Release From Burning (kt C)	B Delayed Emissions From Decay (kt C) (10-year average)	C Total Annual Carbon Release (kt C)	D Total Annual CO_2 Release (Gg CO_2)
		C = A + B	D = C x (44/12)
18.56	0.00	18.56	68.06

This spreadsheet contains Worksheet 5-3, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**ON-SITE BURNING OF FORESTS - NON-CO_2 TRACE GASES FROM BURNING BIOMASS**
WORKSHEET	**5-3**
SHEET	**1 OF 1 NON-CO_2 GAS EMISSIONS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1			**STEP 2**				
A Quantity of Carbon Released (kt C)	B Nitrogen-Carbon Ratio	C Total Nitrogen Released (kt N)		D Trace Gas Emissions Ratios	E Trace Gas Emissions (kt C)	F Conversion Ratio	G Trace Gas Emissions from Burning of Cleared Forests (Gg CH_4, CO)
(From column K, sheet 2 of Worksheet 5-2)		C = (A x B)			E = (A x D)		G = (E x F)
			CH_4	0.012	0.22	16/12	0.29700
			CO	0.06	1.11	28/12	2.59875
					(kt N)		(Gg N_2O, NO_x)
18.56	0.01	0.19			E = (C x D)		G = (E x F)
			N_2O	0.007	0.00	44/28	0.00204
			NO_x	0.121	0.02	46/14	0.07380

This spreadsheet contains sheet 1 of Worksheet 5-4, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

	MODULE	**LAND-USE CHANGE AND FORESTRY**				
	SUBMODULE	**ABANDONMENT OF MANAGED LANDS**				
	WORKSHEET	**5-4**				
	SHEET	**1 OF 3 CARBON UPTAKE BY ABOVEGROUND REGROWTH - FIRST 20 YEARS**				
	COUNTRY	**St. Lucia**				
	YEAR	**1994**				
		STEP 1				
Vegetation types		A 20-Year Total Area Abandoned and Regrowing (kha)	B Annual Rate of Aboveground Biomass Growth (t dm/ha)	C Annual Aboveground Biomass Growth (kt dm)	D Carbon Fraction of Aboveground Biomass	E Annual Carbon Uptake in Aboveground Biomass (kt C)
				C = (A x B)		E = (C x D)
Tropical	Wet/Very Moist			0.00		0.00
	Moist, short dry season			0.00		0.00
	Moist, long dry season			0.00		0.00
	Dry			0.00		0.00
	Montane Moist			0.00		0.00
	Montane Dry			0.00		0.00
Tropical Savanna/Grasslands				0.00		0.00
Temperate	Coniferous			0.00		0.00
	Broadleaf			0.00		0.00
Grasslands				0.00		0.00
Boreal	Mixed Broadleaf/Coniferous			0.00		0.00
	Coniferous			0.00		0.00
	Forest tundra			0.00		0.00
Grasslands/Tundra				0.00		0.00
Other				0.00		0.00
					Subtotal	0.00

This spreadsheet contains sheet 2 of Worksheet 5-4, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE		**LAND-USE CHANGE AND FORESTRY**				
SUBMODULE		**ABANDONMENT OF MANAGED LANDS**				
WORKSHEET		**5-4**				
SHEET		**2 OF 3 CARBON UPTAKE BY ABOVEGROUND REGROWTH - > 20 YEARS**				
COUNTRY		**St. Lucia**				
YEAR		**1994**				
		STEP 2				
Vegetation types		G Total Area Abandoned for more than Twenty Years (kha)	H Annual Rate of Aboveground Biomass Growth (t dm/ha)	I Annual Aboveground Biomass Growth (kt dm)	J Carbon Fraction of Aboveground Biomass	K Annual Carbon Uptake in Aboveground Biomass (kt C)
				I = (G x H)		K = (I x J)
Tropical	Wet/Very Moist			0.00		0.00
	Moist, short dry season			0.00		0.00
	Moist, long dry season			0.00		0.00
	Dry			0.00		0.00
	Montane Moist			0.00		0.00
	Montane Dry			0.00		0.00
Tropical Savanna/Grasslands				0.00		0.00
Temperate	Coniferous			0.00		0.00
	Broadleaf			0.00		0.00
Grasslands				0.00		0.00
Boreal	Mixed Broadleaf/Coniferous			0.00		0.00
	Coniferous			0.00		0.00
	Forest tundra			0.00		0.00
Grasslands/Tundra				0.00		0.00
Other				0.00		0.00
					Subtotal	0.00

This spreadsheet contains sheet 3 of Worksheet 5-4, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**ABANDONMENT OF MANAGED LANDS**
WORKSHEET	**5-4**
SHEET	**3 OF 3 TOTAL CO_2 REMOVALS FROM ABANDONED LANDS**
COUNTRY	**St. Lucia**
YEAR	**1994**
STEP 3	
L Total Carbon Uptake from Abandoned Lands (kt C)	M Total Carbon Dioxide Uptake (Gg CO_2)
L = (E + K)	M = (L x (44/12))
0.00	0.00

This spreadsheet contains sheet 1 of Worksheet 5-5, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

CORRECT: Land Areas Match

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**CHANGE IN SOIL CARBON FOR MINERAL SOILS**
WORKSHEET	**5-5**
SHEET	**1 OF 4**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEPS 1 AND 2					**STEP 3**		
A Land-use/ Management Systems	B Soil type	C Soil Carbon (t) (Mg C/ha)	D Land Area (t-20) (Mha)	E Land Area (t) (Mha)	F Soil Carbon (t-20) (Tg)	G Soil Carbon (t) (Tg)	H Net change in Soil Carbon in Mineral Soils (Tg per 20 yr)
					F = (C x D)	G = (C x E)	H = (G - F)
All Systems	High activity soils		0.00	0.00	0.00	0.00	0.00
	Low activity soils		0.00	0.00	0.00	0.00	0.00
	Sandy		0.00	0.00	0.00	0.00	0.00
	Volcanic		0.06	0.06	3.16	2.63	-0.52
	Wetland (Aquic)		0.00	0.00	0.00	0.00	0.00
Totals			0.06	0.06			-0.52

Note: that land areas in columns D and E, summed over all land-use/management systems used in the inventory should be equal.
Total land areas within each soil type, across all land-use systems, should also remain constant over the inventory period.
Note: All land managment systems identified in this worksheet will also be identified in the supplemental sheet 5-5A. If certain land management systems are agriculturally impacted please input data in the appropriate section identified by that land management system in the supplemental worksheet 5-5A.

A	B	C	D	E	F	G	H
Forests	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	52.80	0.026612	0.021744	1.41	1.15	-0.26
	Wetland (Aquic)	0.00			0.00	0.00	0.00
SubTotal			0.03	0.02			-0.26
Settlement	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00	0.005	0.014454	0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
SubTotal			0.01	0.01			0.00

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**CHANGE IN SOIL CARBON FOR MINERAL SOILS**
WORKSHEET	**5-5**
SHEET	**1 OF 4**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEPS 1 AND 2					**STEP 3**		
A Land-use/ Management Systems	B Soil type	C Soil Carbon (t) (Mg C/ha)	D Land Area (t-20) (Mha)	E Land Area (t) (Mha)	F Soil Carbon (t-20) (Tg)	G Soil Carbon (t) (Tg)	H Net change in Soil Carbon in Mineral Soils (Tg per 20 yr)
					F = (C x D)	G = (C x E)	H = (G - F)
Grassland	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00	0.0001	0.0001	0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
Rock Outcrops and Beaches	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00	0.000143	0.000143	0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
Conservation	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00	0.00032	0.000193	0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
Agriculture	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	59.40	0.029468	0.025009	1.75	1.49	-0.26
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.03	0.03			-0.26

MODULE	LAND-USE CHANGE AND FORESTRY
SUBMODULE	CHANGE IN SOIL CARBON FOR MINERAL SOILS
WORKSHEET	5-5
SHEET	1 OF 4
COUNTRY	St. Lucia
YEAR	1994

STEPS 1 AND 2					STEP 3		
A Land-use/ Management Systems	B Soil type	C Soil Carbon (t) (Mg C/ha)	D Land Area (t-20) (Mha)	E Land Area (t) (Mha)	F Soil Carbon (t-20) (Tg)	G Soil Carbon (t) (Tg)	H Net change in Soil Carbon in Mineral Soils (Tg per 20 yr)
					F = (C x D)	G = (C x E)	H = (G - F)
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00

MODULE	LAND-USE CHANGE AND FORESTRY
SUBMODULE	CHANGE IN SOIL CARBON FOR MINERAL SOILS
WORKSHEET	5-5
SHEET	1 OF 4
COUNTRY	St. Lucia
YEAR	1994

STEPS 1 AND 2					STEP 3		
A Land-use/ Management Systems	B Soil type	C Soil Carbon (t) (Mg C/ha)	D Land Area (t-20) (Mha)	E Land Area (t) (Mha)	F Soil Carbon (t-20) (Tg)	G Soil Carbon (t) (Tg)	H Net change in Soil Carbon in Mineral Soils (Tg per 20 yr)
					F = (C x D)	G = (C x E)	H = (G - F)
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00

MODULE	LAND-USE CHANGE AND FORESTRY
SUBMODULE	CHANGE IN SOIL CARBON FOR MINERAL SOILS
WORKSHEET	5-5
SHEET	1 OF 4
COUNTRY	St. Lucia
YEAR	1994

STEPS 1 AND 2					STEP 3		
A Land-use/ Management Systems	B Soil type	C Soil Carbon (t) (Mg C/ha)	D Land Area (t-20) (Mha)	E Land Area (t) (Mha)	F Soil Carbon (t-20) (Tg)	G Soil Carbon (t) (Tg)	H Net change in Soil Carbon in Mineral Soils (Tg per 20 yr)
					F = (C x D)	G = (C x E)	H = (G - F)
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00

MODULE	LAND-USE CHANGE AND FORESTRY
SUBMODULE	CHANGE IN SOIL CARBON FOR MINERAL SOILS
WORKSHEET	5-5
SHEET	1 OF 4
COUNTRY	St. Lucia
YEAR	1994

STEPS 1 AND 2					STEP 3		
A Land-use/ Management Systems	B Soil type	C Soil Carbon (t) (Mg C/ha)	D Land Area (t-20) (Mha)	E Land Area (t) (Mha)	F Soil Carbon (t-20) (Tg)	G Soil Carbon (t) (Tg)	H Net change in Soil Carbon in Mineral Soils (Tg per 20 yr)
					F = (C x D)	G = (C x E)	H = (G - F)
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00

MODULE	LAND-USE CHANGE AND FORESTRY
SUBMODULE	CHANGE IN SOIL CARBON FOR MINERAL SOILS
WORKSHEET	5-5
SHEET	1 OF 4
COUNTRY	St. Lucia
YEAR	1994

STEPS 1 AND 2					STEP 3		
A Land-use/ Management Systems	B Soil type	C Soil Carbon (t) (Mg C/ha)	D Land Area (t-20) (Mha)	E Land Area (t) (Mha)	F Soil Carbon (t-20) (Tg)	G Soil Carbon (t) (Tg)	H Net change in Soil Carbon in Mineral Soils (Tg per 20 yr)
					F = (C x D)	G = (C x E)	H = (G - F)
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
	SubTotal		0.00	0.00			0.00

MODULE	LAND-USE CHANGE AND FORESTRY
SUBMODULE	CHANGE IN SOIL CARBON FOR MINERAL SOILS
WORKSHEET	5-5
SHEET	1 OF 4
COUNTRY	St. Lucia
YEAR	1994

STEPS 1 AND 2					STEP 3		
A Land-use/ Management Systems	B Soil type	C Soil Carbon (t) (Mg C/ha)	D Land Area (t-20) (Mha)	E Land Area (t) (Mha)	F Soil Carbon (t-20) (Tg)	G Soil Carbon (t) (Tg)	H Net change in Soil Carbon in Mineral Soils (Tg per 20 yr)
					F = (C x D)	G = (C x E)	H = (G - F)
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
SubTotal			0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
SubTotal			0.00	0.00			0.00
	High activity	0.00			0.00	0.00	0.00
	Low activity	0.00			0.00	0.00	0.00
	Sandy	0.00			0.00	0.00	0.00
	Volcanic	0.00			0.00	0.00	0.00
	Wetland (Aquic)	0.00			0.00	0.00	0.00
SubTotal			0.00	0.00			0.00

This spreadsheet contains Worksheet 5-5A (supplemental), in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**SOIL CARBON FOR AGRICULTURALLY IMPACTED LANDS**
WORKSHEET	**5-5A (SUPPLEMENTAL)**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Land-use/ Management Systems	B Soil type	C Soil Carbon under Native Vegetation (Mg C/ha)	D Base Factor	E Tillage Factor	F Input Factors	G Soil Carbon in Agriculturally Impacted Lands (Mg C/ha)
						G = (C x D x E x F)
All Systems	High Activity Soils	0.00	0.00	0.00	0.00	0.00
	Low Activity Soils	0.00	0.00	0.00	0.00	0.00
	Sandy	100.00	0.70	0.00	0.00	0.00
	Volcanic	400.00	2.60	2.20	1.70	112.20
	Wetland (Aquic)	100.00	0.50	0.00	0.00	0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
Forest	Volcanic	100	0.6	1.1	0.8	52.80
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
Settlements	Volcanic	100	0.7			0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
Grassland	Volcanic	100	0.7			0.00

MODULE	LAND-USE CHANGE AND FORESTRY
SUBMODULE	SOIL CARBON FOR AGRICULTURALLY IMPACTED LANDS
WORKSHEET	5-5A (SUPPLEMENTAL)
SHEET	1 OF 1
COUNTRY	St. Lucia
YEAR	1994

A Land-use/ Management Systems	B Soil type	C Soil Carbon under Native Vegetation (Mg C/ha)	D Base Factor	E Tillage Factor	F Input Factors	G Soil Carbon in Agriculturally Impacted Lands (Mg C/ha)
						G = (C x D x E x F)
	Wetland (Aquic)					0.00

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**SOIL CARBON FOR AGRICULTURALLY IMPACTED LANDS**
WORKSHEET	**5-5A (SUPPLEMENTAL)**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Land-use/ Management Systems	B Soil type	C Soil Carbon under Native Vegetation (Mg C/ha)	D Base Factor	E Tillage Factor	F Input Factors	G Soil Carbon in Agriculturally Impacted Lands (Mg C/ha)
						G = (C x D x E x F)
Rock outCrops and Beaches	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy	100	0.7			0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
Conservation	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)	100	0.5			0.00
Agriculture	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic	100	0.6	1.1	0.9	59.40
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**SOIL CARBON FOR AGRICULTURALLY IMPACTED LANDS**
WORKSHEET	**5-5A (SUPPLEMENTAL)**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Land-use/ Management Systems	B Soil type	C Soil Carbon under Native Vegetation (Mg C/ha)	D Base Factor	E Tillage Factor	F Input Factors	G Soil Carbon in Agriculturally Impacted Lands (Mg C/ha)
						G = (C x D x E x F)
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**SOIL CARBON FOR AGRICULTURALLY IMPACTED LANDS**
WORKSHEET	**5-5A (SUPPLEMENTAL)**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Land-use/ Management Systems	B Soil type	C Soil Carbon under Native Vegetation (Mg C/ha)	D Base Factor	E Tillage Factor	F Input Factors	G Soil Carbon in Agriculturally Impacted Lands (Mg C/ha)
						G = (C x D x E x F)
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**SOIL CARBON FOR AGRICULTURALLY IMPACTED LANDS**
WORKSHEET	**5-5A (SUPPLEMENTAL)**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Land-use/ Management Systems	B Soil type	C Soil Carbon under Native Vegetation (Mg C/ha)	D Base Factor	E Tillage Factor	F Input Factors	G Soil Carbon in Agriculturally Impacted Lands (Mg C/ha)
						G = (C x D x E x F)
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00

MODULE	LAND-USE CHANGE AND FORESTRY
SUBMODULE	SOIL CARBON FOR AGRICULTURALLY IMPACTED LANDS
WORKSHEET	5-5A (SUPPLEMENTAL)
SHEET	1 OF 1
COUNTRY	St. Lucia
YEAR	1994

A Land-use/ Management Systems	B Soil type	C Soil Carbon under Native Vegetation (Mg C/ha)	D Base Factor	E Tillage Factor	F Input Factors	G Soil Carbon in Agriculturally Impacted Lands (Mg C/ha)
						G = (C x D x E x F)
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**SOIL CARBON FOR AGRICULTURALLY IMPACTED LANDS**
WORKSHEET	**5-5A (SUPPLEMENTAL)**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Land-use/ Management Systems	B Soil type	C Soil Carbon under Native Vegetation (Mg C/ha)	D Base Factor	E Tillage Factor	F Input Factors	G Soil Carbon in Agriculturally Impacted Lands (Mg C/ha)
						G = (C x D x E x F)
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**SOIL CARBON FOR AGRICULTURALLY IMPACTED LANDS**
WORKSHEET	**5-5A (SUPPLEMENTAL)**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Land-use/ Management Systems	B Soil type	C Soil Carbon under Native Vegetation (Mg C/ha)	D Base Factor	E Tillage Factor	F Input Factors	G Soil Carbon in Agriculturally Impacted Lands (Mg C/ha)
						G = (C x D x E x F)
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00
	High Activity Soils					0.00
	Low Activity Soils					0.00
	Sandy					0.00
	Volcanic					0.00
	Wetland (Aquic)					0.00

This spreadsheet contains sheet 2 of Worksheet 5-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**LAND-USE CHANGE AND FORESTRY**		
SUBMODULE	**CARBON EMISSIONS FROM INTENSIVELY-MANAGED ORGANIC SOILS**		
WORKSHEET	**5-5**		
SHEET	**2 OF 4**		
COUNTRY	**St. Lucia**		
YEAR	**1994**		
STEP 4			
Agricultural Use of Organic Soils	A Land Area (ha)	B Annual Loss Rate (Mg C/ha/yr) (Default)	C Net Carbon Loss from Organic Soils (Mg/yr)
			C = (A x B)
Cool temperate			
Upland crops			0.00
Pasture/Forest			0.00
Warm temperate			
Upland crops			0.00
Pasture/Forest			0.00
Tropical			
Upland crops			0.00
Pasture/Forest	1	5	5.00
		Total	5.00

This spreadsheet contains sheet 3 of Worksheet 5-5, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**LAND-USE CHANGE AND FORESTRY**		
SUBMODULE	**CARBON EMISSIONS FROM LIMING OF AGRICULTURAL SOILS**		
WORKSHEET	**5-5**		
SHEET	**3 OF 4**		
COUNTRY	**St. Lucia**		
YEAR	**1994**		
STEP 5			
Type of lime	A Total Annual Amount of Lime (Mg)	B Carbon Conversion Factor	C Carbon Emissions from Liming (Mg C)
			C = (A x B)
Limestone $Ca(CO_3)$	440	0.12	52.80
Dolomite $CaMg(CO_3)_2$		0.122	0.00
		Total	52.80

This spreadsheet contains sheet 4 of Worksheet 5-5, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**LAND-USE CHANGE AND FORESTRY**
SUBMODULE	**CALCULATION OF TOTAL CO_2-C EMISSIONS FROM AGRICULTURALLY-IMPACTED SOILS**
WORKSHEET	**5-5**
SHEET	**4 OF 4**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 6

Source	A Worksheet values	B Unit Conversion Factor	C Total Annual Carbon Emissions (Gg)	D Convert to Total Annual CO_2 Emission (Gg/yr)
			C = (A x B)	D= C x (44/12)
Total Net Change in Soil Carbon in Mineral Soils	-0.52	-50	26.09	95.68
Total Net Carbon Loss from Organic Soils	5.00	0.001	0.01	0.02
Carbon Emissions from Liming	52.80	0.001	0.05	0.19
			Total	95.89

This spreadsheet contains Worksheet 6-1, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**METHANE EMISSIONS FROM SOLID WASTE DISPOSAL SITES**
WORKSHEET	**6-1**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1	**STEP 2**	**STEP 3**						**STEP 4**				
A Total Annual MSW Disposed to SWDSs (Gg MSW)	B Methane Correction Factor (MCF)	C Fraction of DOC in MSW	D Fraction of DOC which Actually Degrades	E Fraction of Carbon Released as Methane	F Conversion Ratio	G Potential Methane Generation Rate per Unit of Waste (Gg CH_4/Gg MSW)	H Realised (Country-specific) Methane Generation Rate per Unit of Waste (Gg CH_4/ Gg MSW)	J Gross Annual Methane Generation (Gg CH_4)	K Recovered Methane per Year (Gg CH_4)	L Net Annual Methane Generation (Gg CH_4)	M One Minus Methane Oxidation Correction Factor	N Net Annual Methane Emissions (Gg CH_4)
						G= (C x D x E x F)	H= (B x G)	J= (H x A)		L= (J - K)		N= (L x M)
107	1.0	0.5	0.77	0.5	16/12	0.26	0.26	27.46	0	27.46	1	27.46
1.09	0.8	0.5	0.77	0.5	16/12	0.26	0.21	0.22	0	0.22	1	0.22
1.09	0.4	0.5	0.77	0.5	16/12	0.26	0.10	0.11	0	0.11	1	0.11

This spreadsheet contains Worksheet 6-1A (supplemental), in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**QUANTITY OF MSW DISPOSED OF IN SOLID WASTE DISPOSAL SITES USING COUNTRY DATA**
WORKSHEET	**6-1A (SUPPLEMENTAL)**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Population whose Waste goes to SWDSs (Urban or Total) (persons)	B MSW Generation Rate (kg/capita/day)	C Annual Amount of MSW Generated (Gg MSW)	D Fraction of MSW Disposed to SWDSs (Urban or Total)	E Total Annual MSW Disposed to SWDSs (Gg MSW)
		C = (A x B x 365)/1 000 000		E = (C x D)
142,689	1.5	78.12	0.8	62.50

This spreadsheet contains Worksheet 6-1B (supplemental), in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**QUANTITY OF MSW DISPOSED OF IN SOLID WASTE DISPOSAL SITES USING DISPOSAL RATE DEFAULT DATA**
WORKSHEET	**6-1B (SUPPLEMENTAL)**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

A Population whose Waste goes to SWDSs (Urban or Total) (persons)	B MSW Disposal Rate to SWDSs (kg/capita/day)	C Total Annual MSW Disposed to SWDSs (Gg MSW)
		C = (A x B x 365)/1 000 000
142,689	1.5	78.12

This spreadsheet contains Worksheet 6-1C (supplemental), in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**METHANE CORRECTION FACTOR**
WORKSHEET	**6-1C (SUPPLEMENTAL)**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

Type of Site	W Proportion of Waste (by weight) for Each Type of SWDSs	X Methane Correction Factor (MCF)	Y Weighted Average MCF for Each Type of SWDS
			Y = W x X
Managed	0.98	1	0.98000
Unmanaged - deep (>=5m waste)	0.01	0.8	0.00800
Unmanaged - shallow (< 5m waste)	0.01	0.4	0.00400
Total	1	1.2	0.99200

This spreadsheet contains sheet 1 of Worksheet 6-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**METHANE EMISSIONS FROM DOMESTIC AND COMMERCIAL WASTEWATER AND SLUDGE TREATMENT**
WORKSHEET	**6-2**
SHEET	**1 OF 4 ESTIMATION OF ORGANIC WASTEWATER AND SLUDGE**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 1

A Region or City	B Population (1,000 persons)	C Degradable Organic Component (kg BOD/1000 persons/yr)	D Fraction of Degradable Organic Component Removed as Sludge	E Total Domestic/Commercial Organic Wastewater (kg BOD/yr)	F Total Domestic/Commercial Organic Sludge (kg BOD/yr)
				E = [B x C x (1-D)]	F = (B x C x D)
Castries	6.4	26,645.00	0	170,528.00	0.000000000
Gros Islet	2.6	26,645.00	0	69,277.00	0.000000000
				0.00	0.000000000
				0.00	0.000000000
			Total:	239,805.00	0.000000000

This spreadsheet contains sheet 2 of Worksheet 6-2, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**METHANE EMISSIONS FROM DOMESTIC AND COMMERCIAL WASTEWATER TREATMENT**
WORKSHEET	**6-2**
SHEET	**2 OF 4 ESTIMATION OF EMISSION FACTOR FOR WASTEWATER HANDLING SYSTEMS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 2

A Wastewater Handling System	B Fraction of Wastewater Treated by the Handling System	C Methane Conversion Factor for the Handling System	D Product	E Maximum Methane Producing Capacity (kg CH_4/kg BOD)	F Emission Factor for Domestic/Commercial Wastewater (kg CH_4/kg BOD)
			D = (B x C)		F = (D x E)
Raw Sewage	0	0	0.00		
Treatment Pond	0.06	0	0.00		
			0.00		
			0.00		
		Aggregate MCF:	0.00		0.00

This spreadsheet contains sheet 3 of Worksheet 6-2, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**METHANE EMISSIONS FROM DOMESTIC AND COMMERCIAL WASTEWATER TREATMENT**
WORKSHEET	**6-2**
SHEET	**3 OF 4 ESTIMATION OF EMISSION FACTOR FOR SLUDGE HANDLING SYSTEMS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 3

A Sludge Handling System	B Fraction of Sludge Treated by the Handling System	C Methane Conversion Factor for the Handling System	D Product	E Maximum Methane Producing Capacity (kg CH_4/kg BOD)	F Emission Factor for Domestic/ Commercial Sludge (kg CH_4/kg BOD)
			D = (B x C)		F = (D x E)
			0.00		
			0.00		
			0.00		
			0.00		
		Aggregate MCF:	0.00		0.00

This spreadsheet contains sheet 4 of Worksheet 6-2, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**METHANE EMISSIONS FROM DOMESTIC AND COMMERCIAL WASTEWATER AND SLUDGE TREATMENT**
WORKSHEET	**6-2**
SHEET	**4 OF 4 ESTIMATION OF METHANE EMISSIONS FROM DOMESTIC/COMMERCIAL WASTEWATER AND SLUDGE**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 4

	A Total Organic Product (kg BOD/yr)	B Emission Factor (kg CH_4/kg BOD)	C Methane Emissions Without Recovery/Flaring	D Methane Recovered and/or Flared (kg CH_4)	E Net Methane Emissions (Gg CH_4)
	from Worksheet 6-2, Sheet 1	from Worksheet 6-2, Sheets 2 and 3	C = (A x B)		E = (C - D)/1 000 000
Wastewater	239,805.00	0.00	0.00	0	0.00
Sludge	0.00	0.00	0.00	0	0.00
				Total:	0.00

This spreadsheet contains sheet 1 of Worksheet 6-3, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE		**WASTE**					
SUBMODULE		**METHANE EMISSIONS FROM INDUSTRIAL WASTEWATER AND SLUDGE HANDLING**					
WORKSHEET		**6-3**					
SHEET		**1 OF 4 TOTAL ORGANIC WASTEWATER AND SLUDGE**					
COUNTRY		**St. Lucia**					
YEAR		**1994**					
		STEP 1					
		A Total Industrial Output (t/yr)	B Degradable Organic Component (kg COD/m^3 wastewater)	C Wastewater Produced (m^3/tonne product)	D Fraction of Degradable Organic Component Removed as Sludge	E Total Organic Wastewater from Industrial Source (kg COD/yr)	F Total Organic Sludge from Industrial Source (kg COD/yr)
						E = [A x B x C x(1-D)]	F = (A x B x C x D)
Iron and Steel						0.00	0.00
Non-ferrous metals						0.00	0.00
Fertiliser						0.00	0.00
Food & Beverage	Canneries					0.00	0.00
	Beer					0.00	0.00
	Wine					0.00	0.00
	Meatpacking					0.00	0.00
	Dairy products					0.00	0.00
	Sugar					0.00	0.00
	Fish processing					0.00	0.00
	Oil & grease					0.00	0.00
	Coffee					0.00	0.00
	Soft drinks					0.00	0.00
	Other					0.00	0.00
Paper & Pulp	Paper					0.00	0.00
	Pulp					0.00	0.00
	Other					0.00	0.00
Petroleum refining/Petrochemicals						0.00	0.00
	Bleaching					0.00	0.00
	Dying					0.00	0.00
	Other					0.00	0.00
Rubber						0.00	0.00
Other						0.00	0.00
					Total	0.00	0.00

This spreadsheet contains sheet 2 of Worksheet 6-3, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**METHANE EMISSIONS FROM INDUSTRIAL WASTEWATER TREATMENT**
SOURCE	
WORKSHEET	**6-3**
SHEET	**2 OF 4 ESTIMATION OF EMISSION FACTOR FOR WASTEWATER HANDLING SYSTEMS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 2

A Wastewater Handling System	B Fraction of Wastewater Treated by the Handling System	C Methane Conversion Factor (MCF)	D Product	E Maximum Methane Producing Capacity (kg CH_4/kg DC)	F Emission Factor for Industrial Wastewater Source (kg CH_4/kg COD)
			D = (B x C)		F = (D x E)
			0.00		
			0.00		
			0.00		
			0.00		
		Aggregate MCF:	0.00		0.00

Footnote: B_o is expressed in units of kg CH_4/kg DC, where DC is the indicator of degradable component of the waste (either COD or BOD). By definition, BOD is less than or equal to COD; the maximum BOD possible is, in fact, the COD. Therefore, when estimating the maximum CH_4 producing potential from BOD or COD, the maximum potential CH_4 produced per unit of BOD is equivalent to the maximum potential CH_4 produced per unit of COD. This value is 0.25. kg CH_4/kg COD.

This spreadsheet contains sheet 3 of Worksheet 6-3, in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**METHANE EMISSIONS FROM INDUSTRIAL WASTEWATER TREATMENT**
SOURCE	
WORKSHEET	**6-3**
SHEET	**3 OF 4 ESTIMATION OF EMISSION FACTOR FOR SLUDGE HANDLING SYSTEMS**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 2

A Sludge Handling System	B Fraction of Sludge Treated by the Handling System	C Methane Conversion Factor (MCF)	D Product	E Maximum Methane Producing Capacity (kg CH_4/kg COD)	F Emission Factor for Industrial Sludge Source (kg CH_4/kg COD)
			D = (B x C)		F = (D x E)
			0.00		
			0.00		
			0.00		
			0.00		
		Aggregate MCF:	0.00		0.00

This spreadsheet contains sheet 4 of Worksheet 6-3, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**METHANE EMISSIONS FROM INDUSTRIAL WASTEWATER AND SLUDGE TREATMENT**
WORKSHEET	**6-3**
SHEET	**4 OF 4 ESTIMATION OF METHANE EMISSIONS FROM INDUSTRIAL WASTEWATER AND SLUDGE**
COUNTRY	**St. Lucia**
YEAR	**1994**

STEP 4

	A Total Organic Product (kg COD/yr)	B Emission Factor (kg CH_4/kg COD)	C Methane Emissions without Recovery/Flaring	D Methane Recovered and/or Flared (kg CH_4)	E Net Methane Emissions (Gg CH_4)
	Worksheet 6-3, Sheet 1	Worksheets 6-3, Sheets 2 and 3	C = (A x B)		E = (C - D) / 1 000 000
Wastewater	0.00	0.00	0.00		0.00
Sludge	0.00	0.00	0.00		0.00
				Total:	0.00

This spreadsheet contains Worksheet 6-4, in accordance with the
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

MODULE	**WASTE**
SUBMODULE	**INDIRECT NITROUS OXIDE EMISSIONS FROM HUMAN SEWAGE**
WORKSHEET	**6-4**
SHEET	**1 OF 1**
COUNTRY	**St. Lucia**
YEAR	**1994**

	A Per Capita Protein Consumption (Protein in kg/person/yr)	B Population (number)	C Fraction of Nitrogen in Protein $Frac_{NPR}$ (kg N/kg protein)	D Emission factor EF_6 (kg N_2O-N/kg sewage-N produced)	E Total Annual N_2O Emissions (Gg N_2O/yr)
					E = (A x B x C x D) x (44/28) / 1 000 000
Total	50	142700	0.16	0.01	0.02