Sustainable Public Procurement Guidelines
on

ICT equipment: PCs, Laptops and Printers

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Abbreviations

4Rs	Reuse, Recycle, Reduce and Recover
BFRs	Brominated Flame Retardants
CD	Compact Disc
CPU	Central Processing Unit
DVD	Digital Versatile Disc
EMS	Environmental management Systems
EU	European Union
E-waste	electronic waste
GPNI	Green Purchasing Network of India
ICT	Information and Communication Technology
LCA	Life Cycle Assessment
LCC	Life Cycle Cost
MID	Maurice Ile Durable
OAP	Open Advertised Bidding
PBB	Polybrominated biphenyl
PBDE	Polybrominateddiphenyl ethers
PC	Personal Computer
PPA	Public Procurement Act
PPO	Procurement Policy Office
PVC	Poly Vinyl Chloride
SIDS	Small Island Developing State

SPP   Sustainable Public Procurement

SWM   Solid Waste Management

TOR   Terms of Reference

UNEP   United Nations Environment Program

USEPA   United States Environment Protection Agency

VOC   Volatile Organic Compound

1 Introduction, Scope and Methodology

The sustainable procurement guidelines for Information and Communication Technology(ICT) for the Mauritius Public Procurement System have been developed with the twin objectives to give comprehensive information on the rationale behind the sustainable procurement recommendations and to present the sustainability criteria that can be used for Sustainable Public Procurement (SPP). This document covers aspects such as "key environmental impacts", "key social considerations", "appropriate verification schemes", amongst others.

The understanding of SPP has been drawn from the following:

> *"Sustainable Procurement practices integrate requirements, specifications and criteria that are compatible and in favour of the protection of the environment, of social progress and in support of economic development, namely by seeking resource efficiency, improving the quality of products and services and ultimately optimizing costs."[1]*

1.1 Scope

These guidelines cover important environmental issues that should be considered when purchasing ICT equipment - personal computers, laptops and printers. The following items are subject to the guidelines listed below:

Computers & Laptops

- Both desktop (including tower designs) and laptop computers running on versatile operating systems
- Peripherals sold integrated with the microprocessor (PC body), such as monitors, hard disks, keyboards, mouse devices, and external drives (CD, DVD, etc)
- Products sold together with peripherals (those mentioned above), such as AC adapters, cable speakers, and user manuals

Printers

- Used mainly in offices using either the ink jet (IJ) technology and laser technology
- Not included are printers using continuous form paper, or printers using paper sizes larger than A3

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[1]Definition adopted by the High Level Committeeon Management Procurement Networkof the United Nations System

1.2 Methodology of Developing SPP Guidelines for Mauritius

The scope of SPP guidelines for Mauritius has been defined using UNEP sustainable public procurement guidelines for the product. The Public Procurement Act, 2006 of Mauritius was reviewed to identify the parts where sustainable guidelines would need to be incorporated.

The key regulations in Mauritius that have a direct or indirect bearing on emission standards, indoor air quality, waste management, use of chemicals in product manufacture, end-of-life use, labour working conditions and welfare were reviewed for developing the product specific criteria. Similarly international conventions to which Mauritius is a signatory were also reviewed. The overall institutional enablers for sustainability in Mauritius have also been additionally reviewed to appreciate the initiatives taken under various programs.

The environmental impacts of the products across the life cycle namely materials, production, transport, use and disposal have been assessed for development of sustainability criteria. Similarly the social considerations in terms of impacts on workers and community across the life cycle have also been incorporated.

The framework developed by Green Purchasing Network of India (GPNI) as an internationally coordinated and harmonized system was used as the basis for developing the product sustainability criteria for Mauritius. The GPNI framework identified eight common core criteria for sustainability.

A comparison was drawn between product criteria of UNEP, European Commission EUROPA, Green Purchasing guidelines used in Japan and select ecolabels such as Blue Angel and Nordic Swan (where applicable) to identify criteria SPP in Mauritius. The UNEP criteria were used as a base, to which criteria from the other sources that were found applicable to Mauritius and easy to verify were added. Such criteria which have relevance to Mauritius have been used.

Refer **Annex 1** for differences between UNEP guidelines and the product guidelines developed for Mauritius.

The sustainability criteria have been customized considering the fact that most products are imported from other countries and verification of compliance to the criteria needs further strengthening in Mauritius. The criteria have been classified as basic and advanced to enable seamless integration of 'sustainability' in the procurement process. The 'basic' criteria are easy to comply and verify; and have to be fulfilled at all times for procurement of the product. The 'advanced' criteria can be adopted once the system matures and the market along with other requirements for sustainable public procurement is better developed.

1.3 Structure

The guidance document starts with discussion of key environmental impacts of ICT for office use and then brings out the social considerations which need to be addressed. The legislations, if any, in the context of the product manufacture and across the life cycle has been discussed next.

The criteria are divided into the typical steps in a procurement action viz, tender subject matter, technical specifications, supplier qualification requirements, evaluation criteria. For each criterion, guidance is also provided on how to verify compliance.

The document contains implementation notes as guidance for implementing the proposed SPP criteria. Additional information on life cycle costing and ecolabels have also been provided.

2   Incorporating Sustainability into the Mauritian Procurement Process

The public procurement process in Mauritius is administered under the Public Procurement Act 2006. The Public Procurement Regulations 2008 have been drafted under Section 61 of the Act of 2006. The Regulations further elaborate and define procedures for implementing the provisions of the Act.

2.1   Public Procurement Act (PPA) 2006

The Act elucidates the basic principles and procedures to be applied during public procurement of goods, public works and services. Consisting of nine Parts each dealing with different aspects of public procurement from institutional framework to the conduct of the bidding process, it forms the overarching procurement guide for procurement officials (refer **Figure 1**)
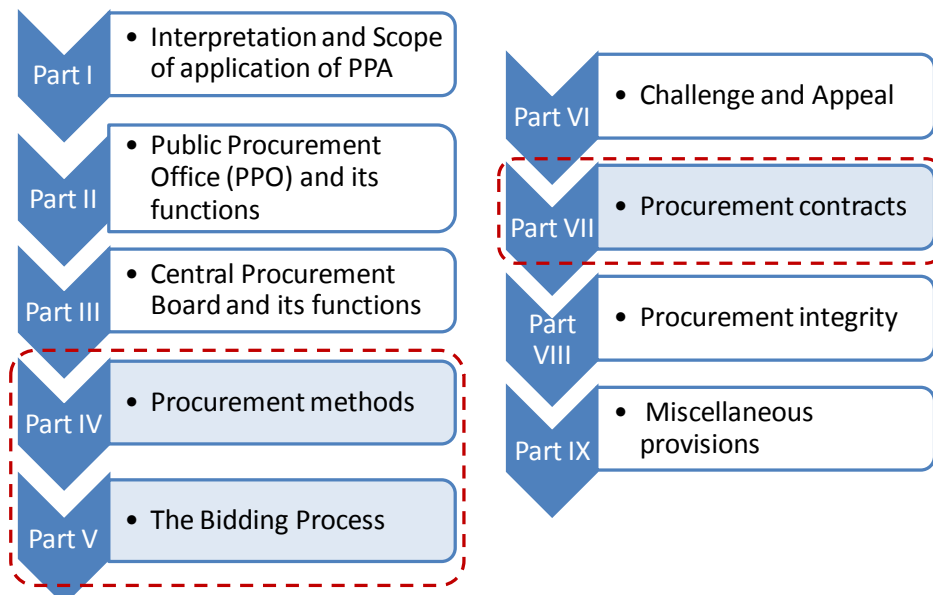
Figure 1: Public Procurement Act 2006

Parts IV, V and VII of the Act are of importance in SPP, as sustainability considerations can be incorporated in these sections.

2.1.1 Procurement Methods

In Part IV, the conditions for the use of procurement methods other than open advertised bidding, and the mandate to provide reasons for doing so, are described. Of the total ten methods[2] listed in the PPA, **six** are stated to be "for procurement of goods, other services and works" (which is the category the five SPP target products fall under):

1. Open advertised bidding
2. Restricted bidding
3. Request for sealed quotations
4. Direct procurement
5. Community or end-user participation, or
6. Departmental execution

2.1.2 Procurement Process

The **Figure 2** depicts the outline of conventional procurement process[3] as conducted as per PPA 2006. The stages where sustainability requirements can be integrated have also been highlighted with alphabets.
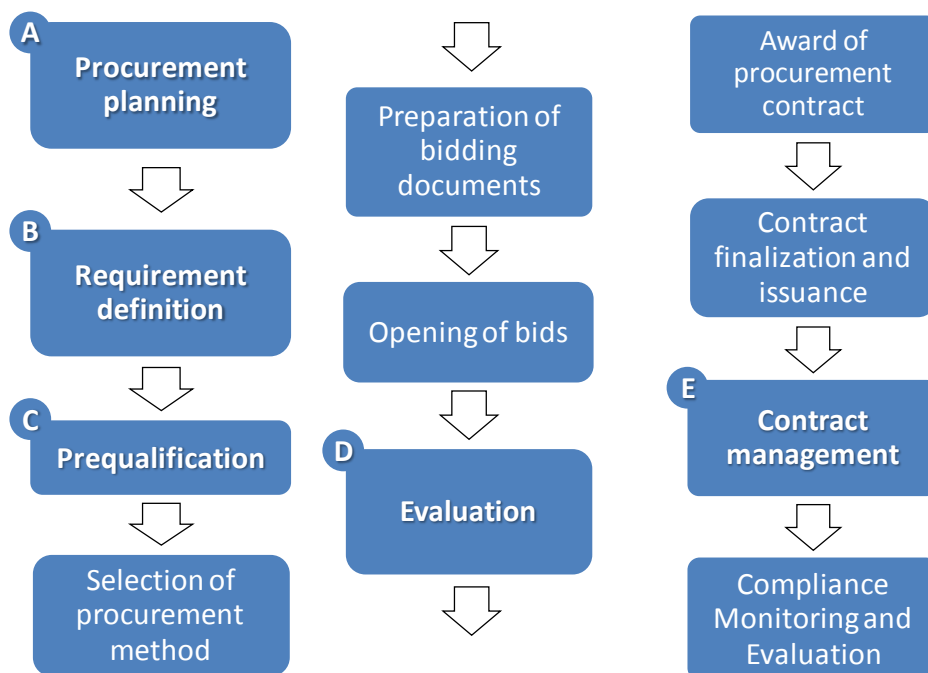
Figure 2: Mauritius procurement process

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[2] The ten methods are: Open advertised bidding, Open national bidding, Open international bidding, Restricted bidding, Request for sealed quotations, Emergency procurement, Community and end-user participation, Departmental execution, Request for proposals, Direct procurement

[3] Also referred to as *bidding process*

Source: Adapted from UNEP Procurement Process (SPP Guidelines Product Sheet Furniture)

2.1.3 Procurement Planning under PPR 2008

The Public Procurement Regulations under Section 10 guide the public bodies in procurement planning to ensure that procurement is carried out within allocated financial estimates. Public bodies are required to prepare an annual procurement plan that includes: (a) the type and quantity of the goods and services to be procured; (b) the timing and implementation of the procurement; (c) an indication of possible packages of procurement, and their value; and (d) an indication of possible pre-qualification proceedings and procurement methods to be used.

The Regulations also include a provision of conducting need assessment as per the guidelines of the Policy Office for any individual procurement.

2.1.4 Requirement definitions under PPR 2008

Also commonly called "Technical specifications", it defines requirements of the product or service in detail. For large contracts, the procurement requirements have to be defined and described at the planning stage itself.

2.1.5 Prequalification and Post Qualification under PPA 2006

Prequalification process is conducted to identify bidders that are qualified, before the invitation to bids. This process is used for large and major contracts or contracts that require skilled expertise. Unless bidders pass this stage, they are not permitted to submit bids.

Post qualification process involves checking the qualifications of the lowest evaluated substantially responsive bidder against the criteria specified in the bidding documents. For cases where the bid fails to conform to these criteria, the bid is rejected and the same process is applied to the next ranked bid.

2.1.6 Evaluation under PPA 2006

According to the PPA, 2006, the evaluation criteria present in the Standard Bidding Documents for Goods helps the procurer in selecting the 'lowest evaluated substantially responsive bids'.

In the sequence of tasks, the financial proposals of only those bidders are considered who are responsive to the technical evaluation. The financial proposals are evaluated by the public body after a public announcement of the results of the technical evaluation.

The present evaluation criteria adopted under the PPA 2006 has features which reflect elements of life cycle costing as well as preference for indigenous producers. Some of these factors are discussed below.

- **Cost of major replacement components, mandatory spare parts, and service. [any one of the following]**
    - The list of items and quantities of major assemblies, components, and selected spare parts, likely to be required during the initial period of operation is in the List of Goods. An adjustment equal to the total cost of these items, at the unit

prices quoted in each bid, shall be added to the bid price, for evaluation purposes only.

Or

o The Purchaser will draw up a list of high-usage and high-value items of components and spare parts, along with estimated quantities of usage in the initial period of operation. The total cost of these items and quantities will be computed from spare parts unit prices submitted by the Bidder and added to the bid price, for evaluation purposes only.

- **Availability in Mauritius of spare parts and after sales services for equipment offered in the bid.**

An adjustment equal to the cost to the Purchaser of establishing the minimum service facilities and parts inventories if quoted separately, is added to the bid price, for evaluation purposes only.

- **Projected operating and maintenance costs**

An adjustment to take into account the operating and maintenance costs of the Goods will be added to the bid price, for evaluation purposes only.

- **Performance of the equipment**

An adjustment representing the capitalized cost of additional operating costs over the life of the plant will be added to the bid price for evaluation purposes. The adjustment will be evaluated based on the drop in the guaranteed performance or efficiency offered in the bid below the norm of 100, using a specified methodology.

2.2 Mode of Integrating Sustainability in the Procurement Process

In **Figure 3** the stages and the manner in which sustainability interventions could be introduced in the procurement process have been indicated. The subsections below describe details of how this could be achieved.

| A | Procurement planning | — Need analysis
— Market research
— Defining subject matter i.e. giving an appropriate title |

| B | Prequalification | Assessing suppliers' eligibility on
▪ Environmental and social performance |

| C | Requirement definition | — Environmental specifications, technical standards
— Social specifications and criteria
— Performance and functional requirements |

Selection of procurement method

Preparation of bidding documents

Opening of bids

| D | Evaluation | — Evaluation criteria
— Best Value For Money based on Lifecycle costing |

Award of procurement contract

Contract finalization and issuance

| E | Contract management | — Using environmental and social contract performance clauses |

Figure 3: Stages at which sustainability interventions can be incorporated in the procurement process

2.2.1 Procurement Planning

Procurement planning is an essential step in SPP. It is the process of identifying and consolidating requirements and determining the timeframes for their procurement with the aim of having them as and when they are required. At this step the need assessment should be carried out with due considerations been given to the required outcome sought from the procurement and whether the 'need' can be met by more sustainable alternative. Considering sustainability at an early stage of procurement decision-making may identify opportunities to:

• avoid or reduce consumption, by finding other alternatives
• identify whether there is a more sustainable alternative readily available
• rethink and revise specifications in order to improve sustainability outcomes

The procurement planning phase could contain several important sustainable procurement-related interventions, as an extension of its conventional goals of ensuring timely solicitation of bids, cost efficiency, making an annual procurement plan (budgeting, product type and quantities, procurement method etc), conducting market research and identifying needs,

among others.[4] Of particular importance are the needs assessment exercise and defining the subject matter (a green title for the contract).

Conducting a rigorous **needs analysis** forms an important part of this stage of SPP since reducing consumption is the simplest way to reduce one's impact on the environment. Correctly identifying the volumes to be procured including evaluating ways in which volumes can be reduced, is the first step. It would involve internal consultations on current arrangements and potential adjustments in current modes of functioning. There may or may not be opportunities to reduce quantities, but the option must be explored as it forms the first step to integrating sustainability in Mauritian public procurement.

Giving **a green title** (i.e. the subject matter) to the contract conveys to the market the intention of procuring with sustainability considerations in mind. Clearly labelling a contract with a green title makes it easier for prospective bidders to promptly recognize the requirements of the procurer. It instantly expresses the point that the environmental performance of the product or service will have significant importance at the award stage, and that the other steps in the procurement process are linked to the title. Examples of titles include: "Recycled paper for writing, printing and copying purposes"; "Environmental cleaning services including selective waste collection"[5].

2.2.2 Requirement Definitions

Introduction of environmental considerations should not lead to a compromise on the quality of the product. The quality and functionality of the sustainable goods and services must either be the same, or better than, what is hitherto being procured. The sustainability requirements for goods and services should be defined along with technical specifications.

2.2.3 Pre-qualification and Post-qualification Requirements

The technical and professional qualifications of bidders are examined to determine their capability to supply the desired products. This stage may address the sustainability experience of the bidder and its environmental and social performance. This method may be a useful way to improve the general environmental management and corporate social responsibility of companies. Where possible, preference should be given to domestic Mauritian suppliers, in accordance with the SME promotion initiative of the Government[6].

2.2.4 Sustainability Evaluation Criteria

The National Action Plan for Sustainable Public Procurement in Mauritius (2011-2015) defines "Evaluation Criteria" as follows:

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[4] Public Procurement (Regulations 2008), Mauritius; Environmental Procurement Practice Guide Volume 1, UNDP Practice Series. September 2008. http://www.greeningtheblue.org/sites/default/files/UNDP-Environmental%20procurement_0.pdf

[5] Environmental Procurement Practice Guide Volume 1, UNDP Practice Series. September 2008. http://www.greeningtheblue.org/sites/default/files/UNDP-Environmental%20procurement_0.pdf

[6] Promotion of SMEs through a business facilitation programme has been given priority by the Government through the Business Facilitation (miscellaneous provisions) Act 2006. (Source: Source: National Action Plan on Sustainable Public Procurement (SPP) for Mauritius (2011- 2015)

> *"Evaluation Criteria are used to evaluate and compare the bids received which meet the minimum specifications (i.e. compliant bids). In sustainable procurement, it is essential to indicate that the contract will be awarded to the offer that provides "best value for money"- the term used if criteria other than just the price will be assessed when comparing bids. **Evaluation criteria evaluate the performance of a bid both in terms of price and other criteria, such as environmental performance**. As with all phases of the tendering process, the tender documents published by the purchasing authority must clearly set out the various evaluation criteria that will be used to evaluate bids(such as price, technical quality, environmental quality, social performance, etc.) as well as the weight in percentage terms allocated to each aspect. In sustainable procurement, evaluation criteria can be used to encourage higher levels of sustainability performance than those demanded in the specifications, without risking significant increases in cost. **Sustainability evaluation criteria should, altogether, account for at least 10 % of the total points available."**[7]*

To implement SPP in Mauritius, a life-cycle approach[8] will need to be taken while developing Evaluation and Qualification Criteria. For bids that have passed the minimum qualifications (Prequalification procedure), the technical evaluation criteria will need to be satisfied by the goods. Costs which will be incurred during the lifetime of the goods or service are equally important as the procurement price and are taken into consideration when doing "Life cycle costing". The existing evaluation of a bid takes into account, in addition to the Bid Price quoted other factors which are conducive to implementing LCC. These factors can be adapted with certain modifications to reflect LCC to achieve the best value for money.

The evaluation criteria will take account of:
  (a) the price considering the Life cycle costing
  (b) responsiveness to sustainability criteria

Under the SPP process the technical evaluation shall consider the verification of SPP requirement definitions stated. Bid evaluation will determine which Bidder wins the contract and how sustainable the contract will actually be in practice. This stage therefore needs to ensure transparency which is already a part of the present evaluation process

2.2.5 Contract Management

Contract management involves administration of contracts drawn with the Suppliers and ensuring compliance to the terms and conditions. The compliance to specifications meeting the sustainability criteria for the goods and services as submitted during bidding should be inspected during delivery. The compliance of Suppliers to the pre-qualification criteria should also be periodically checked where the contract periods are longer. The suppliers performance during the contract period should be evaluated so as to generate a central database for use in future procurements.

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[7] Adopted from National Action Plan on Sustainable Public Procurement - Mauritius
[8] Life cycle approach has been explained in details in Section 10.

2.3 Framework Agreements

These find mention in the National Action Plan on Sustainable Public Procurement (SPP) for Mauritius (2011- 2015), and subsequently included as an amendment (in 2013) in the PPA 2006 which is of relevance in implementing SPP. A framework agreement is an "umbrella agreement" that sets out terms (on pricing, quality and quantity) under which individual contracts may be prepared throughout the agreement period[9]. They are usually used when procuring agencies know they will face a constant or repeated need for a particular product or service over a period of time, but are unsure of the extent or frequency. Thus, it has direct applicability to the five target products - office supplies, IT equipment, cleaning products and services, furniture and passenger cars. The advantages apply to both bidders and procurers. Bidders are assured of regular business, and procurers could expect greater number of bidders (higher competition due to attractiveness of regular business). This increases chances of procuring sustainable products at the best available price. Furthermore, it eliminates the bureaucratic hassle of individual agencies procuring small volumes several times, in addition to saving time and money.

3 Institutional Enablers for Sustainable Public Procurement (SPP) in Mauritius

The Government of Mauritius recognizes that procurement decisions by public bodies have inherent social, public health, environmental and economic impacts both locally and globally on an immediate and long-term basis. Towards this end, they have used several regulatory and non-regulatory drivers, pilot projects, policies and strategies to stimulate Sustainable Public Procurement in the country. This section elaborates on some of these initiatives taken by the Govt. of Mauritius that stimulates Sustainable Public Procurement on a holistic basis.

3.1 "Maurice Ile Durable" (MID) Policy, Strategy and Action Plan

Maurice Ile Durable (MID) was announced as a concept by the Prime Minister of Mauritius, Dr. The Honourable Navinchandra Ramgoolam in 2008. Triggered by the global energy crisis, MID has now been expanded to include sustainable growth strategy of the country. The MID now aims to facilitate economic growth that acknowledges the limitations of the natural resource availability, embraces green economy, with empowerment of it population and striving towards equitable distribution of wealth; thus nurturing a vision for Mauritius to become a model of sustainable development.

In order to coordinate the "Maurice Ile Durable" (MID) project from a more holistic perspective, harmonize efforts in the MID endeavour, and look into all aspects of sustainability, Commission on Maurice Ile Durable (MID Commission) was initiated in 2011.The MID Commission operates under the aegis of the Prime Minister's Office in collaboration with the Ministry of Environment and Sustainable Development and other stakeholders. The MID

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[9] Usually a maximum of 4 years (Source: National Action Plan on Sustainable Public Procurement (SPP) for Mauritius (2011- 2015))

Commission developed the 'MID Policy, Strategy and Action Plan' which has recently received the acceptance of the Cabinet. The MID Policy, Strategy and Action Plan has identified many projects/activities which would be implemented in the short, medium and long terms to bring coherence and to enhance existing activities by introducing new ideas for better sustainable development. SPP is one of the key strategies recognized by this document. MID recognizes Sustainable Public and Private Procurement in the country as a key strategy towards greening of the economy and has proposed actions towards operationalization of SPP.

3.2 National Programme on Sustainable Consumption and Production (2008 - 2013)

The overall objective of the National Programme on Sustainable Consumption and Production is to change energy consumption patterns, encourage technological shifts and behavioural change, increase resource efficiency, change consumption patterns and increase the demand and supply of sustainable products and services in the market. The Programme was approved by the Cabinet in August 2008. The Programme also is aimed at greening the economy through a number of projects. One of the projects identified under this Programme and accorded high priority is Sustainable Government Procurement.

The Programme also identified the development of a National Eco-Labelling framework as one of the projects. Mauritius Standard Bureau (MSB)[10] in collaboration with MoESD is setting up an Environment Friendly Label (EFL) for goods and services. TOR on the development of an Eco-labelling scheme for local products and services in Mauritius has been finalized.[11]

Inter-linkages can be drawn between SPP and the Mauritian Ecolabelling Framework as shown in **Box 1**. Collaboration of these two schemes on their technical specifications may lead to progress of the economy on the path of sustainable development.

Box 1: Inter-linkages between SPP and Mauritian Ecolabelling Network

- *The technical specifications under Sustainability Criteria of SPP can be mapped to the certification criteria of the ecolabelling framework. This will help in maintaining uniformity on a macro-economic basis thus stimulating the acceptance of both the schemes by the stakeholders.*

- *During the evaluation and examination phase of SPP process, the certification by Mauritian ecolabel can be used as a verification tool for technical specifications.*

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[10]The Mauritius Standards Bureau (MSB) is a corporate body which has been set up under the Mauritius Standards Bureau Act 1993. The Bureau is responsible for standardization, quality assurance, testing and metrology. MSB operates a certification marking scheme for products and a national management system certification scheme (ISO 9001, ISO 14001, ISO 27001, ISO 22000, HACCP).

[11]Mid Term Review of the National Programme on Sustainable Consumption and Production (SCP); MoESD; February 2012

3.3 National Action Plan on SPP for Mauritius (2011-2015)

The Procurement Policy Office (PPO), under the Ministry of Finance and Economic Development, has been identified as the enabler for implementation of the SPP project. The PPO developed the 'National Action Plan on Sustainable Public Procurement for Mauritius' in July 2011. The Cabinet approved the Action Plan in November 2011 and contextualised it the MID. The National Action Plan for Mauritius promotes sustainable public procurement in accordance with Government's policy statement and in the following five themes: People; Policy, Strategy and Communication; Procurement Process; Supplier Engagement; and Monitoring and Reporting. The following seven products/services have been selected as the focus products: **1) Paper and Printing; 2) IT Devices; 3) Cleaning Products and Services; 4)Office and Classroom Furniture; 5) Vehicles; 6) Food and Catering Services and 7) Construction work**. The Capacity building of procurement officers has been identified as a crucial step for the successful implementation of the action plan.

3.4 Solid Waste Management

With the vision for "an efficient and sustainable management of solid wastes", the Ministry of Local Government and Outer Islands set up the Solid Waste Management (SWM) Department in Mauritius. This public body developed the SWM Strategy (2011-15) as a coordinated and an integrated approach to achieve an effective and cost efficient collection and storage of wastes as well as adequate disposal infrastructures and treatment technologies for sustainable waste disposal.

The strategy recognizes that if waste continues to grow at the present rate, the total amount of waste requiring management and disposal would be around 472,500 Tons by the year 2015. Besides domestic and yard waste, paper and metal has been identified as the key wastes generated in Mauritius. The quantification and characterization of E-waste (electronic waste) is at present being done which has been identified as a task under the SWM strategy.

To mitigate this environmental and societal challenge, a few pilot projects have been initiated. These are briefly described below.

- **Pilot Project on E-waste: Collection and Disposal from select Government Offices**

  About 40 tonnes of e-waste presently stored with selected public offices has been identified for collection, dismantling and disposal purposes. An e-waste recycling company has also been identified to carry out these activities. Based on the pilot-project a detailed study will be carried to develop a mechanism for e-waste collection, dismantling and disposal.

- **Pilot Project on Paper Recycling**

  This pilot programme aims at collecting the paper wastes (mainly used printing and photocopier paper) generated by few selected public offices for the purpose of recycling. To perform this task effectively, two formal recycling companies have already been authorized by the SWM Department who use this waste paper to manufacture paper boards. This project is currently ongoing and is being studied to

understand the cost economic, environmental impacts and other issues related to waste paper collection and recycling.

Inter-linkages can be drawn between SPP and the pilot programmes on solid waste management as shown in **Box 2**.

Box 2: Inter-linkages between SPP and SWM pilot projects
Up-scaling of the pilot projects on e-waste and paper waste will promote SPP in Mauritius as the mechanism to address the end-of-life impacts can be managed. A systematic recycling program can help procurements under SPP by helping introduction of sustainability criteria aimed at management of product disposal. *Also the up-scaling of end-of-life waste management, which itself can be get a boost through SPP, will facilitate the creation of green jobs in the country.*

3.5 Facilitation of End-of-Life Disposal of Procured Items in Public Bodies

In the past, the method prescribed for end-of-life disposal of procured goods from public bodies of Mauritius was destruction as prescribed in the Financial Management Manual. Due to this there was no possibility of recycling or recovery of end-of-life products thus invariably leading to disposal as waste. This would result in increasing the environmental burden of the island country. To address this, the Financial Management Manual has been updated in 2012 and provisions for proper practices towards end-of-life disposal of products have been incorporated thus facilitating recycling.

Identification and authorization processes for formal recycling enterprises in the country have already been started for recycling of waste generated from products like electrical and electronic equipment, paper, plastics, batteries and waste oil. These will facilitate the end-of-life goods from the public bodies.

As can be seen from the above discussions there are various initiatives which have been started in Mauritius which are conducive to the uptake of SPP. Some of these are at Policy and Strategy level, while the others are Action level. In order to SPP to succeed there has to be a concerted effort not only at the PPO level but also through the initiatives and involvement of other ministries and government agencies. The present linkage of SPP with the other initiatives in Mauritius can be presented diagrammatically as presented in **Figure 4**.
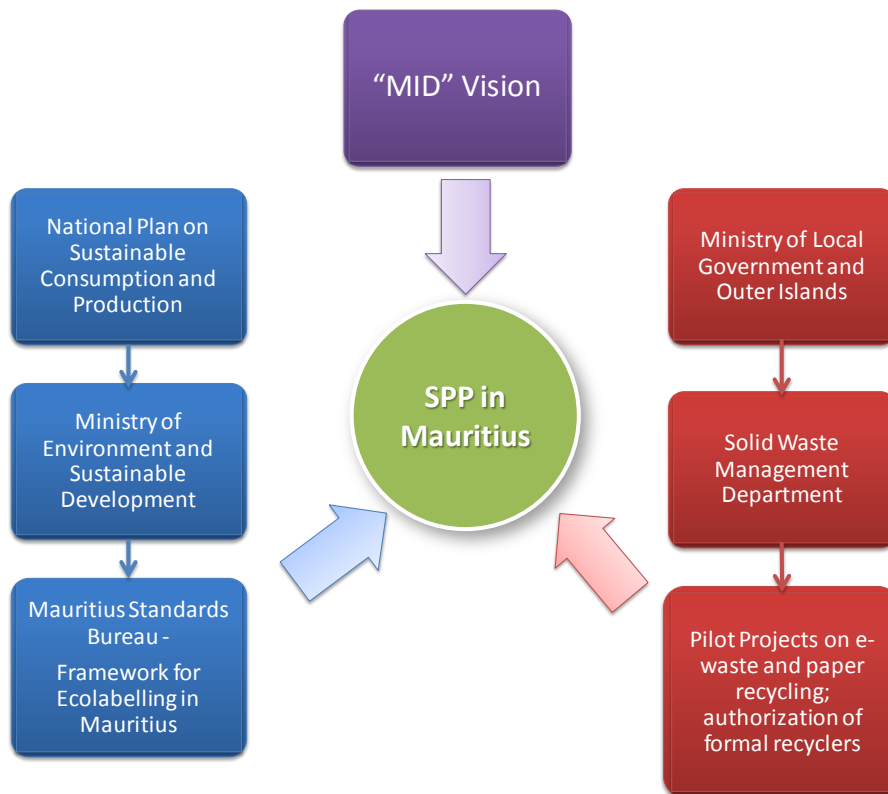
Figure 4: Institutional enablers to stimulate SPP in Mauritius

4 Key Environmental Impacts

As Mauritius is a Small Island Developing State (SIDS)[12], it is more sensitive than non-SIDS nations on certain environmental impact aspects.[13] Like all other SIDS, the remote geographical location and small physical size makes Mauritius ecologically fragile, and limits its capacity to respond to natural and environmental disasters. Limited industrial capacities mean a heavy dependence on imports for most products. This makes Mauritius vulnerable to high transport costs and uncertainty of supplies.

The environmental impacts of a sustainable product are identified (and addressed) based on a Life Cycle Assessment (LCA) of the product. LCA is a tool for the systematic evaluation of the environmental impacts of a product or service system through all stages of its life cycle

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[12]Small island developing states (SIDS) are a group of countries that "share similar sustainable development challenges, including small population, limited resources, susceptibility to natural disasters, vulnerability to external shocks and excessive dependence on international trade. Their growth and development is often further stymied by high transportation and communication costs, disproportionately expensive public administration and infrastructure due to their small size, and little to no opportunity to create economies of scale"

[13] SIDS focused Green Economy: An analysis of challenges and opportunities. UNEP, UN DESA and FAO, 2012

from raw materials extraction to disposal[14]. It is an important supporting instrument for aiding decision-making on environmental impacts concerning products or services.

As majority of ICT equipment including PCs, laptops and printers are imported into Mauritius from overseas, transportation will account for a significant proportion of the life cycle impacts, when evaluated in the Mauritian context. However the geographical location of the country leaves no choice but to import at the cost of high air and sea transport emissions, unlike the multiple options that the non-island nations of the world can consider in similar situations. Therefore, transportation impacts are excluded from the scope of these guidelines.

The environmental impacts of computers, laptops and printers in the Mauritian context occur during the use phase and end-of-life disposal. The impacts across the life cycle are as follows:

- Depletion of finite natural resources due to raw material extraction and energy consumption during production and use of the product

- Depletion of water resources due to consumption in the production phase of materials

- Air pollution due to release of hazardous substances used during production and disposal

- Water pollution due to effluents from production processes contaminated with various pollutants such as alkalis, acids, spent solvents and heavy metals

- Impact on human health due to adsorption of chemicals used as additives, stabilizers and flame retardants in plastics

- Generation of electrical and electronic waste due to a lack of reparability options, low durability and unavailability of spare parts

- Land and water pollution due to presence of heavy materials (lead, mercury, cadmium) and hazardous substances (chlorinated and brominated substances, toxic gases, toxic metals, photo-active) in the product and its components which are leached into the environment due to unscientific disposal

- Land pollution due to generation of high quantity of packaging waste

A schematic of key environmental impacts across the life cycle of computers, laptops and printers is presented in **Figure 5**.

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[14] UNEP website
http://www.unep.org/resourceefficiency/Consumption/StandardsandLabels/MeasuringSustainability/LifeCycleAssessment/tabid/101348/Default.aspx
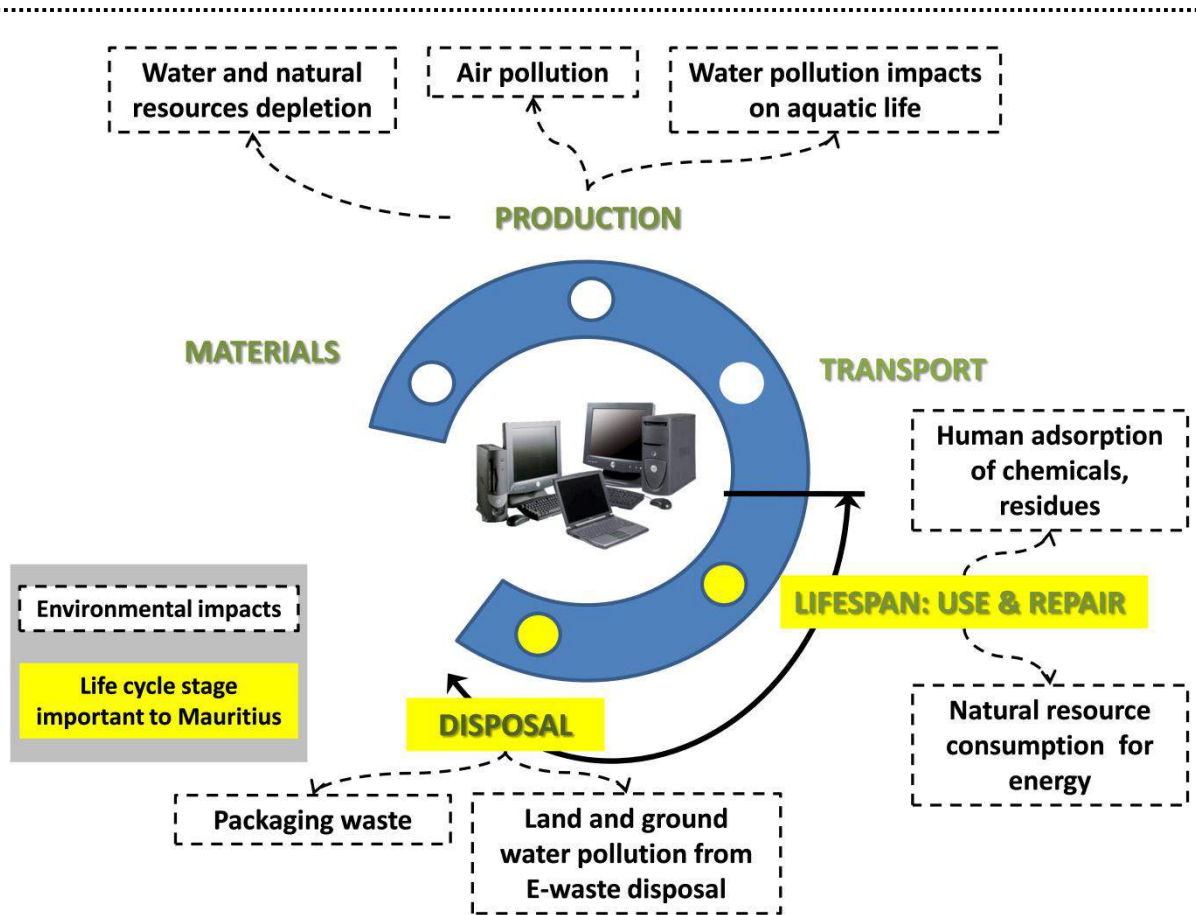
Figure 5: Key Environmental Impacts across the Life Cycle of ICT equipment

As noted above the different stages in the life cycle have potential impacts on the environment and these impacts pose various environmental risks. Environmental risk is the probability of an undesirable event arising from human action that is transmitted through the environment. Impacts are concerned with events that are reasonably certain to occur, while risk assessment is concerned with events that may possibly occur. A number of impacts such as air pollution due to conventional energy generation, release of pollutants during production etc could lead to the same risk namely climate change. Similarly a number of activities and their impacts during production and disposal of the product and its allied components could pose a risk to human health. Consumption of large quantities of water during production also leads to the risk of water security. (See **Figure 6**).
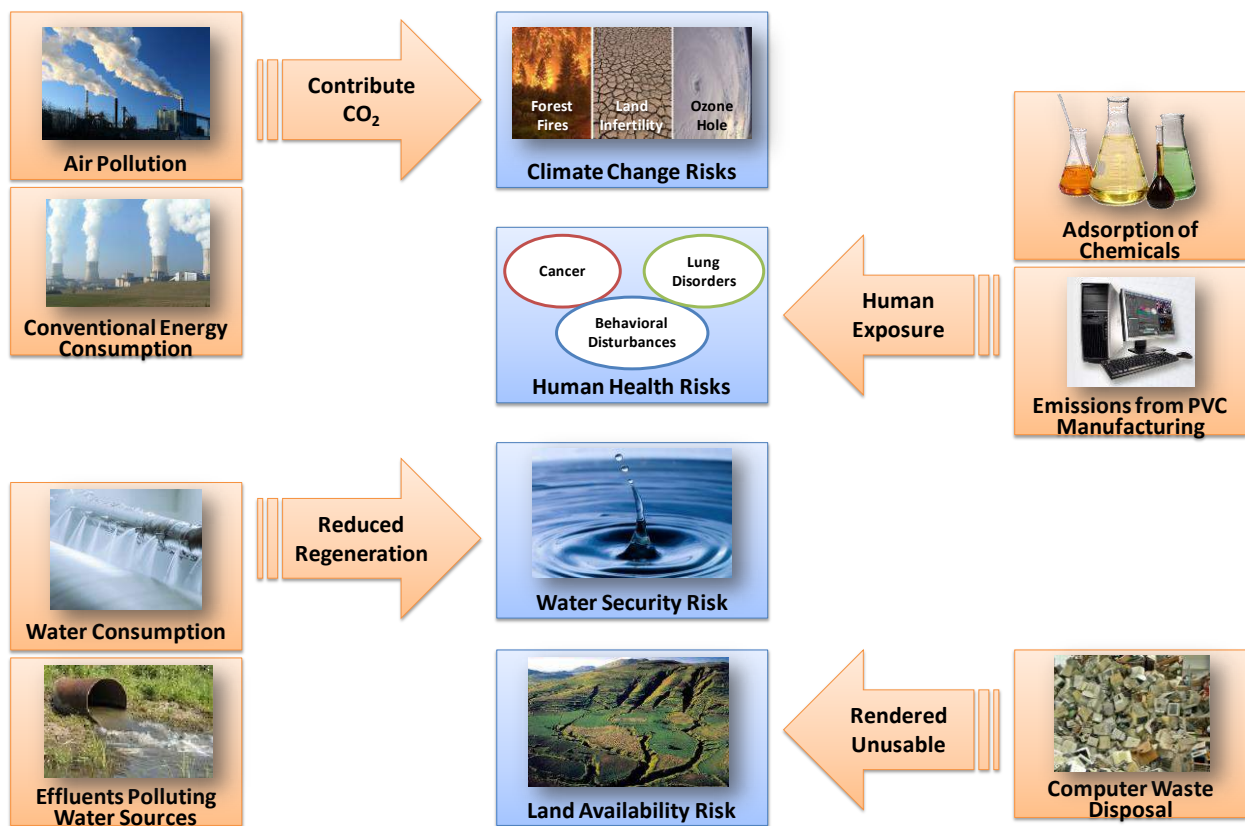
Figure 6: Key Environmental Impacts and their Risks

The following sections present the key environmental impacts relating to computers, laptops and printers across the life cycle.

4.1 Potential Environmental Impacts

4.1.1 Energy Consumption

Computers & Laptops

The key environmental impact of the product is energy consumption during the production and use phase. As per the information provided by ENERGY STAR® on theirwebsite[15], most studies report that for typical computers (used 8 hours per day including Standby over 260 days) primary energy consumption during use is more than 3 to 4 times higher than the primary energy needed for manufacturing and materials production, whilst the energy costs/credits of waste disposal and recycling are negligible (<15% of production energy). A laptop typically uses 50 to 80% less energy than a computer during the use phase. These products consume electricity even when they have been turned off, but are still plugged in.

Most computers and laptops are now available with energy saving modes ('sleep'/ 'standby'). Additionally, user behaviour plays a critical role in energy saving. Whilst energy consumption

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[15]http://www.eu-energystar.org

in the 'active' mode is principally determined by the functionality of the machine (powerful, high-specification models will consume more energy), differences exist between models offering the same level of functionality.

Printers

As per the information provided by ENERGY STAR® on theirwebsite, eco-profiles for imaging equipment vary considerable. As printers are in standby mode for long periods low standby use and power management are more important than with computers. Printers also require consumables such as paper and toners/ cartridges. Energy saving for printers would also indirectly include the energy consumed in paper manufacture. Hence double-sided printing functions in printers are the best energy saving options. Choice of printers should also take into account toner/ cartridge consumption to reduce the life cycle energy consumption.

4.1.2 Hazardous Constituents

Computers, laptops and printers contain a variety of hazardous substances as listed below[16]:

Brominated Flame Retardants (BFRs) used in printed circuit boards, cables, wires and plastic for computer casings do not break down easily and build up in the environment. Long-term exposure to certain BFRs can lead to impaired learning and memory functions.

Mercury used in flat-panel displays, may be harmful to the nervous system and toxic in high doses. Approximately 0 to 50 mg mercury is present in each LCD monitor, due to the use of energy efficient CFL backlighting. However, there are trends towards LED and OLED backlighting in the market over the next 5 to 10 years which would not require mercury content.

Lead used in cathode ray tubes and batteries, can be harmful to the nervous system and poisonous in high doses.

Cadmium used in rechargeable computer batteries, contacts and switches tend to bioaccumulate in the environment and is highly toxic, primarily affecting the kidneys and bones.

Compounds of **hexavalent chromium**, used in the production of metal housings, are highly toxic and human carcinogens.

Polyvinyl chloride (PVC) is a chlorinated plastic used in computers, laptops, printers and for insulation on wires and cables. Chlorinated dioxins and furans are released when PVC is produced or disposed of by incineration (or simply burning). These chemicals are highly persistent in the environment and many are toxic even in very low concentrations.

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[16] *OK Computer?* Nicola Scott and Mary Rayner, 2007
http://www.ethicalconsumer.org/magazine/buyers/computers.pdf

4.1.3 Noise

The noise generated by various components of the Central Processing Unit (CPU) in computers could be distracting and lead to stress for the users. The main sources of noise are motors and spinning components such as the hard drive, CPU fan, case cooling fans, and power supply fan. Computer manufacturers are now considering acoustics as a parameter for designing systems.

4.1.4 Disposal and Durability

The disposal of electronic appliances in landfill sites or through incineration leads creates a number of environmental problems. Firstly a considerable amount of resources used during manufacture is lost. Improper disposal of electronic waste can also release hazardous chemicals and heavy metals into the environment (see hazardous constituents section above).

A key concern with computers, laptops and printers is the limited life cycle and the need for regular replacements. It is important to ensure that sufficient warranty and spare parts availability is provided. The design of the machine (i.e. how easy it is to simply upgrade parts) is also significant.

4.1.5 Consumable Materials for Imaging Equipment

Printers consume large quantities of consumables such as paper and toner/ cartridges.

Ecolabels in Europe such as Nordic Swan and Blue Angel have criteria for remanufactured toner cartridges themselves which cover a number of environmental impacts. These cover four areas (not all issues are covered by both labels):

Ecolabels covering toner cartridges tend to focus on the following environmental impacts:

- Chemicals contained in the toner powder, which can be harmful to both human health and the environment, for example the use of heavy metals or aromatic amine residues.
- Chlorinated plastics such as PVC used in the cartridge parts or packaging, together with the use of brominated flame retardants in the casing
- Use of recycled materials, reuse and take-back systems
- Release of VOCs (volatile organic compounds) during use

The Nordic Swan background report on Toners[17]notes that the greatest environmental problem with toner cartridges is resource consumption. As noted above, the energy which goes into the production of toner cartridges is significant. As such, the encouragement of reuse and recycling of toner cartridges is of most importance in reducing environmental impacts.

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[17]Available on request from www.svanen.nu

Currently two approaches for reuse are common. Certain companies remanufacture cartridges for resale. Many manufacturers of cartridges also offer take-back services although these are then typically recycled rather than remanufactured.

4.1.6 Packaging

Packaging is an integral part of the goods supply chain. It is used to protect goods from damage and allowing efficient distribution. Environmental issues relating to packaging include resource consumption, primary energy consumption in manufacturing the packaging, environmental effects of chemicals used during manufacture and in the final packaging (particularly chlorinated plastics), and waste generation.

Although this represents a very small proportion of the total environmental impact of the product, it is important to consider packaging and it is also easy for procurers to put simple conditions in place when tendering. For example, the quantity and type of packaging used and the opportunities for recycling should be considered.

4.1.7 Manufacturing

As mentioned earlier, although the main environmental impact for a computer is energy consumption during the use phase, according to the 2003 United Nations University Report —Computer and the Environment: Understanding and Managing their Impacts‖ manufacturing of computers is materials intensive when comparing products by weight. —The total fossil fuels used to make one desktop computer weigh over 240 kilograms, some 10 times the weight of the computer itself. Also, substantial quantities of chemicals (22 kg), and water (1,500 kg) are used. The environmental impacts associated with using fossil fuels (e.g. climate change), chemicals (e.g. possible health effects on microchip production workers) and water (e.g. scarcity in some areas) are significant. Long-term health impacts on workers, families, and neighbouring communities could occur due to chemical exposure and emissions from production stages such as microchip fabrication (Kuehr& Williams, 2003).

4.2 Reducing the Key Environmental Impacts

Table 1 summarises the main environmental impacts related to computers, laptops and printers as described above, and indicates the focus of measures to address these impacts.

Table 1- Key environmental impacts of ICT equipment for office use

#	Impact	Sustainable Procurement Approach
1.	Depletion of finite natural resources due to raw material extraction and energy consumption during production and use of the product	Purchase energy efficient models Promote recyclability and take back options
2.	Depletion of water resources due to consumption in the production phase of materials	
3.	Air pollution due to release of hazardous substances used during production and disposal	Avoid certain hazardous substances in materials production
4.	Water pollution due to effluents from production processes contaminated with various pollutants such as alkalis, acids, spent solvents and heavy metals	Obtain product from sustainably managed manufacturing plants.
5.	Impact on human health due to adsorption of chemicals used as additives, stabilizers and flame retardants in plastics	Avoid certain hazardous substances in materials production and surface treatment
6.	Generation of electrical and electronic waste due to a lack of reparability options, low durability and unavailability of spare parts	Design for recycling, longer life and promote take back options
7.	Land and water pollution due to presence of heavy materials (lead, mercury, cadmium) and hazardous substances (chlorinated and brominated substances, toxic gases, toxic metals, photo-active) in the product and its components which are leached into the environment due to unscientific disposal	Purchase products with a restricted amount of hazardous constituents
8.	Land pollution due to generation of high quantity of packaging waste	Decrease the quantity of packaging used; ensure recyclability; increase use of recycled packaging; and avoid packaging material containing PVC

5   Key Social Considerations

The social considerations applied to any business activity or process originate from international conventions and instruments developed mainly by International Labour Organization and United Nations. The social considerations are related to the ethical treatment of workers engaged in the business and the communities impacted by raw material sourcing.

The following practices are included under social considerations for workers:

1. Promoting fair treatment, non-discrimination, and equal opportunity of workers[18]

2. Establishing, maintaining and improving worker-management relationship

3. Promoting compliance with national employment and labor laws

4. Protecting workers - including vulnerable categories such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain

5. Promoting safe and healthy working conditions, and the health of workers.

6. Avoiding use of forced labor and child labor

7. Allowing worker's organizations and collective bargaining to protect worker's rights regarding working conditions and terms of employment

8. Carrying out collective dismissals and retrenchment in a planned manner

9. Providing grievance mechanism to workers to raise workplace concerns

The above social considerations in a procurement process would be applicable to the producer and supplier of a product.

From the perspective of sustainability, impact of business activities on Indigenous People[19] is also included. These are social groups with identities that are distinct from mainstream groups in national societies. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. The path towards sustainability promotes avoidance of adverse impacts on Indigenous Peoples and sharing benefits of business activities where they are adversely impacted.

Ethical trading, as defined by the Ethical Trade Initiative[20], refers to retailers, brands and their suppliers assuming responsibility for improving the conditions of the people who work for them.

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[18]Non-discrimination and equal opportunity refer to avoid basing employment decisions on parameters such as gender, race, nationality, ethnic, social and indigenous origin, religion or belief, disability, age, or sexual orientation.

[19] As described by International Finance Corporation's Performance Standard 7. There is no universally accepted definition of "Indigenous Peoples." Indigenous Peoples may be referred to in different countries by such terms as "Indigenous ethnic minorities," "aboriginals," "hill tribes," "minority nationalities," "scheduled tribes," "first nations," or "tribal groups."

[20]http://www.ethicaltrade.org/about-eti

Most workers employed by supplier firms are based in developing or underdeveloped countries where there are inadequate legal provisions protecting workers' rights of even if such laws exist, they are rarely enforced. Firms that are committed to supporting ethical trade adopt a code of labour conduct that covers social elements like minimum wages, work hours, occupational health and safety, no child labour or gender discrimination etc. Their suppliers globally are supposed to follow this code of conduct.

However, implementing ethical trade is immensely challenging. This is because present day product supply chains are highly complex, spanning several countries worldwide thereby making traceability and accountability at every stage of the supply chain a difficult process. In addition, labour issues themselves stir debate on the whether forcibly halting certain labour practices is justified. *(For e.g. In poor countries, child labourers are important supplementary income providers in their households. Without the informal work that they do, they may be forced to resort to anti-social practices like thievery, begging for alms or drug addiction to overcome or cope with their constraints, thereby leading them into more serious social problems.[21])*

6   Legislations Impacting Procurement of ICT equipment

6.1   Environmental Regulations

The Environment Protection Act (EPA) 2002 is the main legislative framework to support environmental management in Mauritius. The act has been amended from time to time to be in line with new and emerging challenges, with regard to environmental protection strategies and tools for effective environmental protection and sustainable development. Environmental concerns surrounding economic development have been given greater significance by bringing in Environmental Impact Assessments and Environmental Monitoring tools. Industrial waste audit regulations have also been introduced to encourage industries to self-regulate and adopt cleaner technologies. Since 2010, sustainable development has been included in the portfolio of the Ministry of Environment which empowers the Ministry to make regulations in relation to SCP for:

- the introduction of eco-labelling schemes for products
- carrying out cleaner production opportunity assessments in industry
- the introduction of producer and importer responsibility

Mauritius has been actively pursuing the path of Sustainable Development, with the Maurice Ile Durable (MID) Policy and Strategy Action Plan having been recently approved. Of the four MID Priority Programmes, three are expected to have a direct or indirect impact on product sustainability:

- Energy Conservation and Renewables
- Cleaner, Greener and Pollution Free Mauritius

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[21] http://www.ethicaltrade.org/about-eti

- Green Economy

As the ICT equipment procurement under the Public Procurement System in Mauritius is not manufactured within Mauritius, there are no national regulations on environmental factors that could impact the production process. However, compliance to the national legislations in the country of origin of the product should be ensured. Also there are no environmental issues addressing the importation of such equipment.

6.2 Social regulations

Mauritius has three legal provisions on social considerations, which may be applicable if the products sourced are manufactured within the country.

- Employment Relations Act 2008 and Employment Rights Act 2008

- Occupational Safety and Health Act 2005

- Sex discrimination Act 2002

If local manufacturers bid for a particular product, they shall be required to adhere to these laws, unlike international manufacturers for whom these laws shall not apply. For international bidders, social laws in the country of origin would apply.

7 Framework for developing Sustainability Criteria

7.1 Background

In order to operationalize the **National Action Plan on Sustainable Public Procurement for Mauritius** there is a need for a structured approach. During the operationalization process, it is important to define how the product sustainability will be addressed. Sustainability, as is known, lies in the interplay of environmental quality, economic vitality and social equity and therefore the sustainability criteria should also be encompassing these elements of sustainability. Since the goods and service which will be addressed under this Action Plan will be growing in number and will be of diverse type there is need to evolve or adapt a framework of sustainability criteria which can then be applied across the products to be targeted under the SPP mechanism.

For this a structured and logical approach is required that has the potential for assessing the product sustainability addressing commonality across the elements of sustainability being assessed while being able to maintain the individuality that arises due to the basic nature of the product life cycle. A progressive and hierarchical system of criteria would be the best suited for such an approach.

Sustainability criteria sets have been defined by various organizations and even at country level or multi country level as in the global procurement system developed for the UN system of procurements. But the systems themselves vary in their approach and criteria sets prescribed for similar products. For a country like Mauritius, which, because of its SIDS status,

has to use a framework for criteria development that is flexible and adaptable particularly considering that the source of most products in the country is imported from multiple countries across the world. A study carried out by the Green Purchasing Network India (GPNI) to develop an internationally coordinated and harmonized system provides such a framework.

The following section presents the key elements of the Framework developed towards the standardized assessment criteria and its applicability to the designated product being studied.

7.2 GPNI's Common Core Criteria[22]

In order to develop the framework, GPNI reviewed multiple ecolabels (over 150) from all across the world in an analytical framework to identify a set of common core criteria applicable irrespective of product categories. The common criteria set comprises of eight Common Core Criteria to assess the sustainability performance of products across life cycle.**Figure 7** illustrates GPNI's 8 Common Core Criteria.

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[22] The Framework towards Standardized Assessment Criteria for Eco Products and Eco Services was developed by the Green Purchasing Network India (www.gpnindia.org) to propose a framework towards developing harmonized criteria as applicable to products and services.
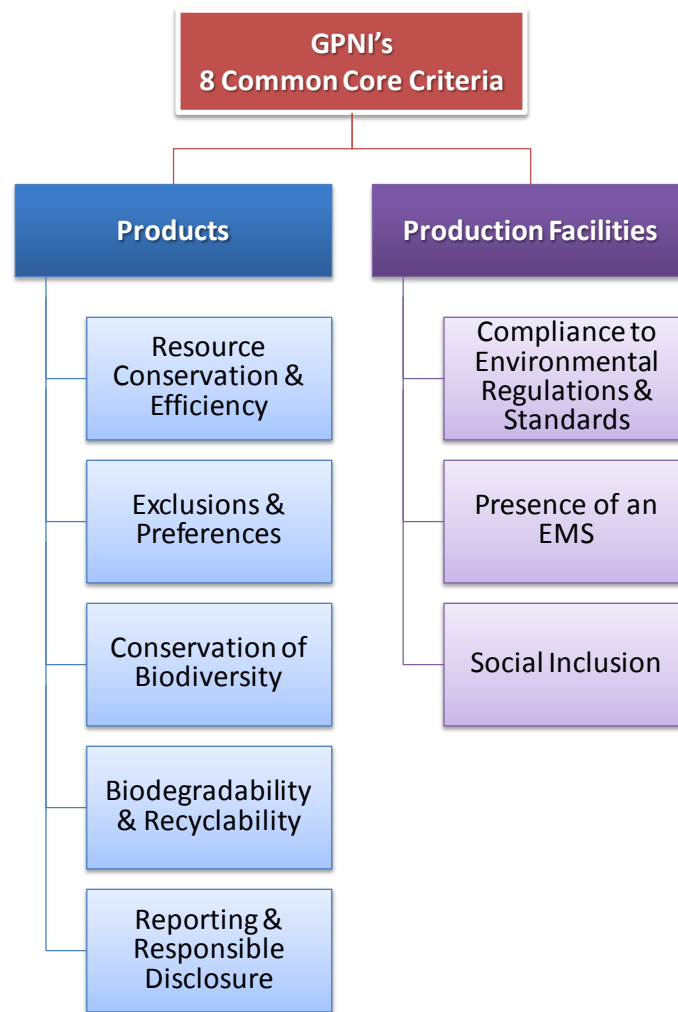
Figure 7: 8 Common Core Criteria proposed by GPNI

Table 2 provides a description of 8 Common Core Criteria proposed by GPNI.

Table 2: Description of GPNI's Common Core Criteria

#	Common Core Criteria	Description
1.	**Resource Conservation and Efficiency**	**Resource Conservation and Efficiency** emphasizes on conservation and efficient consumption of resources. Efforts to conserve resources should be demonstrated to come close to the 'benchmarks' by appropriate choices of technology and by practicing 4Rs (Reuse, Recycle, Reduce and Recover)
2.	**Exclusions and Preferences**	**Exclusions and Preferences** indicate the kinds of substances or technologies that should be or should not be used throughout a life cycle. Exclusion criteria talks

#	Common Core Criteria	Description
		about substances and technologies that should not be used due to their adverse environmental impacts or risks. On the other hand, Preferences should be made for environmentally benign and socially acceptable technologies and substances.
3.	**Conservation of Biodiversity**	**Conservation of Biodiversity** refers to protection and conservation of regional and global ecological resources. The products or services should not pose risk to local, regional or national biodiversity assets.
4.	**Biodegradability and Recyclability**	'**Biodegradability**' means that the product should be easily decomposable by natural agents like microorganisms present in the environment. **Recyclability** indicates the potentials of a finished product to get recycled to a maximum extent possible prior to disposal.
5.	**Reporting and Responsible Disclosure**	Transparency to consumers/customers is very important. **Reporting and Responsible Disclosure** of products and services indicates disclosure of information to the consumers about product-ingredients, safety related precautions during use, environmental impacts and on disposal.
6.	**Compliance to environmental, health and safety regulations**	**Compliance to environmental, health and safety regulations** is one of the basic requirements for certifying products or services. At each stage of life cycle, the product or service needs to conform to the applicable national and international health safety and environmental laws, regulations and standards.
7.	**Presence of Environmental Management Systems(EMS)**	An **Environment Management System, or EMS**, is a comprehensive approach of managing environmental issues, integrating environment-oriented thinking into every aspect of business management. Presence of EMS ensures that greenness of a product or service is consistent and not a chance. It also indicates that a continual process of improvement is in place under the directions of top management.
8.	**Social Inclusions**	**Social inclusion** includes fair trade, pricing, promotion of local sourcing and practicing work related ethics.

7.3 Relevance and Applicability

The Common Core Criteria can be applied to goods to be procured under the SPP mechanism to address the environmental and social impacts caused during its various life cycle stages. Therefore, it can be used as a basic approach in the Sustainable Public Procurement of Mauritius to define technical specifications for products. Out of 8 Common Core Criteria, the three that are applicable to production facilities can be linked to Prequalification Criteria. The remaining five can be mapped to the Sustainability Criteria of SPP process for each product based on the environmental and social impacts caused during each stage of product's life cycle. This harmonized approach of using Common Core Criteria as a basis to develop Sustainability Criteria for product will ensure consistency and completeness of the SPP process in Mauritius.

In line with GPNI's Common Core Criteria, the Sustainability Criteria for SPP of ICT equipment – PCs, Laptops and Printers have been mapped in the following sections.

7.4 Prequalification Criteria

Prequalification Criteria in SPP refers to suppliers' qualification requirements and conformance to social standards. Out of the 8 Common Core Criteria proposed by GPNI, **Table 3** shows the three criteria that can be linked to the Prequalification Criteria for this product:

Table 3: Linking Prequalification Criteria to GPNI's Common Core Criteria

#	GPNI's Common Core Criteria	Prequalification Criteria (examples)
1.	**Compliance to Environmental, Health and Safety Regulations**	Compliance with environmental legislations
2.	**Social Inclusions**	Adherence to national social regulations and standards

7.5 Sustainability Criteria

Besides the three common core criteria mentioned above, the other five common core criteria will have relevance to the Sustainability Criteria being proposed for this product. **Table 4** present it for ICT equipment– PCs & Laptop and **Table 5** present it for ICT equipment- Printers

Table 4: Linking Sustainability Criteria to GPNI's Common Core Criteria - ICT equipment: PCs & Laptops

Sustainability Criteria -ICT equipment: PCs, Laptop and Printers	GPNI's Common Core Criteria				
	Resource Conservation and Efficiency	Exclusions and Preferences	Conservation of Biodiversity	Biodegrad-ability and Recyclability	Reporting and Responsible Disclosure
Energy Consumption: Minimal power consumption during operation and standby mode	✓				
Upgradability Capacity for upgrading and expanding functions in order to make long-term use feasible, and full maintenance service provided by the manufacturer	✓				
Exclusions: Information on harmful substances		✓			✓
Resource Efficiency: Guarantee of availability of parts and components	✓				
Warranty and Durability: Minimum years of warranty and availability of replacement parts for the PCs and laptops	✓				
Packaging: Exclusion of PVC, identification of plastic parts, recycled content, exclusion of heavy metals		✓			
Maintenance PCs and Laptops need to have locally available maintenance support	✓				

Sustainability Criteria -ICT equipment: PCs, Laptop and Printers	GPNI's Common Core Criteria				
	Resource Conservation and Efficiency	Exclusions and Preferences	Conservation of Biodiversity	Biodegrad-ability and Recyclability	Reporting and Responsible Disclosure
End of life, disassembly, recycling and disposal				✔	**1.**

Table 5: Linking Sustainability Criteria to GPNI's Common Core Criteria - ICT Equipment - Printers

Sustainability Criteria - ICT equipment: PCs. Laptop and Printers	GPNI's Common Core Criteria				
	Resource Conservation and Efficiency	Exclusions and Preferences	Conservation of Biodiversity	Biodegrad-ability and Recyclability	Reporting and Responsible Disclosure
Resource Conservation	✔				
Energy Consumption: Minimal power consumption during operation and standby mode	✔				
Exclusions: Information on harmful substances		✔			
Warranty and Durability: Minimum years of warranty and availability of replacement parts for the printers	✔				
Maintenance PCs and laptops need to have locally available maintenance support	✔				

Sustainability Criteria - ICT equipment: PCs. Laptop and Printers	GPNI's Common Core Criteria				
	Resource Conservation and Efficiency	Exclusions and Preferences	Conservation of Biodiversity	Biodegrad-ability and Recyclability	Reporting and Responsible Disclosure
Guarantee of availability of consumables	✔				
End of life, disassembly, recycling and disposal					✔

8 ICT equipment: PCs, Laptops and Printers – Key Sustainability Criteria

8.1 Procurement Planning

In case of procurement of ICT equipment, at this stage an analysis should be carried out to identify the need for equipment procurement. The need assessment could include the analysis of the use of the equipment. Such an analysis may evolve the actual needed (some usage may be fulfilled by leasing of equipment instead of procuring it). At this stage the possibility of consolidating the requirement of ICT equipment in various public bodies could also be carried out so that the ICT equipment procurement could be done under the Framework Agreement. Such an approach gives the public bodies possibility of getting better 'value for money' and also provides assurance to the supplier(s) to develop its business in way to meet the requirements of the SPP.

The procurement planning step also should consider the market readiness to deliver. Thus procurement planning may require engagement with ICT equipment suppliers in a transparent dialogue.

8.2 Developing the criteria – Sources and rationale

ICT equipment that can be identified as a sustainable product has been recognised by various organisations / agencies through development of criteria. The criteria included in this sheet are adapted from the Sustainable Procurement Guidelines for IT equipment prepared by UNEP criteria for computers & monitors and imaging equipment, which in turn have been drawn from criteria of three Type I[23]ecolabels–Blue Angel, Nordic Swan and the European

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[23] Type I labels are a voluntary, multiple-criteria based, third party program that awards a license that authorises the use of environmental labels on products indicating overall environmental preferability of a product within a particular product category based on life cycle considerations.

Ecolabel. The reason being that ecolabels are a valuable source of independently developed environmental performance criteria (**Section 11** explains about ecolabels for IT equipment).It may be noted that no ecolabel could be identified in Mauritus or East Africa related to IT equipment

In order to ensure coverage of all IT equipment (particularly PCs, laptops and printers)-related environmental issues, a comparison was made between related criteria of three sources: UNEP, the European Commission, Blue Angel and Eco Mark program (Japan) to establish the most relevant sustainability criteria in use. The application of the criteria to Mauritius was also taken into account.The Section 8.4 presents a combination of criteria from these sources, suitably adapted for application to Mauritius.

8.3 Verification methods

In several world regions, many ICTproduct manufacturing companies have sought to reduce their environmental impacts by establishing environmental management systems in their factories and certifying their products with one or several ecolabels. This is particularly the case in Europe, North America and Japan. The market availability of ICT equipment certified for energy efficiency, restricted hazardous substances, etc. varies between countries but in countries where ecolabel-certified ICT equipment exist, most manufacturers have adopted at least some of the ecolabels

Ecolabel criteria normally comprise, on the one hand, of product specific criteria and, on theother hand, the assessment or verification methods aimed at checking compliance with these criteria. Where procurement criteria are based on ecolabels, the easiest way to prove compliance will be through the possession of the relevant ecolabel (**Section 11** describes Ecolabels in detail). However, even if the product is not ecolabelled, the procurement/contracting authority must allow verification to be done via other means of proof, and this must be made explicit in the tender documents.

Bidders must therefore be given the opportunity to present other means of proof (that the product meets the specifications), such as declarations by the producer or by the supplier, technical and/or product safety sheets; calculationformulas, laboratory tests results, etc.

8.4 Sustainability criteria and verification guidance

This section presents the various possible sustainability criteria which may be considered as part of the SPP.

8.4.1 Prequalification Criteria

The Prequalification sustainability criteria that suppliers should meet for the product are given in **Table 6**.

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http://www.globalecolabelling.net/what_is_ecolabelling/index.htm

Table 6 – Prequalification Sustainability Criteria – PCs, Laptops and Printers

#	Sustainability Criteria - Prequalification	Verification Guidance
1.	**Compliance with environmental legislation** Bidders shall not be permitted to take part in a contract if they: Have been found guilty of grave professional misconduct, including non-compliance with environmental legislation, proven by any means which the contracting authorities can demonstrate; or have not fulfilled obligations relating to the payment of social security contributions in accordance with the legal provisions of the country in which s/he is established or with those of Mauritius	Bidders must provide a declaration that they meet this criterion in the Bid submission form. Upon request, they may be asked to provide documentary proof to support this declaration
2.	**Adherence to national social regulations and standards** Bidders shall not be permitted to take part in a contract if they do not adhere to the national social standards and legislations. The following are the basic requirements: • Employment Relations Act 2008 and Employment Rights Act 2008 • Occupational Safety and Health Act 2005 • Sex discrimination Act 2002	Bidders must provide a declaration that they meet this criterion in the Bid submission form. Upon request, they may be asked to provide documentary proof to support this declaration

8.4.2 Requirement Definition

The sustainability criteria required from suppliers based on which they would be evaluated during bidding are given in **Table 7** (for PCs and Laptops) and **Table 8** (for Printers). The sustainability criteria have been further classified as basic and advanced within each table.

Table 7: Sustainability Criteria Required from Suppliers for PCs and Laptops

#	Sustainability Criteria	Requirement Definition	Verification Guidance
1	**Energy Consumption** Minimal power consumption during operation and standby mode	All products must meet the latest ENERGY STAR® or equivalent criteria for energy performance	All products carrying the ENERGY STAR label will be deemed to comply. Any other appropriate means of proof, such as a technical dossier of the manufacturer along with a test report

#	Sustainability Criteria	Requirement Definition	Verification Guidance
			from a recognized body demonstrating that the criteria are met will also be accepted.
2	**Upgradability** Capacity for upgrading and expanding functions in order to make long-term use feasible, and full maintenance service provided by the manufacturer	PCs and laptops must be designed so that: • The memory is readily accessible and can be changed • The hard disk and, if available, the CD drive and/or DVD drive, can be changed	Bidders must provide a written guarantee that this criterion will be met.
3	**Resource Efficiency** Guarantee of availability of parts and components	For PCs & laptops the availability of compatible batteries and AC adapter and of the keyboard and its parts shall be guaranteed for at least 3 years from the date of delivery.	Bidders must provide a written guarantee that this criterion will be met.
4	**Warranty and Durability** Minimum years of warranty and availability of replacement parts for the PCs and laptops	Bidders must provide a warranty for a period of at least 3 years with on the spot support service. An option to extend the warranty period to 5 years may be given at additional cost.	Bidders must provide a written guarantee that this criterion will be met.
5	**Maintenance** PCs and Laptops need to have locally available maintenance support	Bidders must ensure maintenance support for at least 3 years such that for the PCs and Computers the warranty remains intact	Bidder must provide appropriate documentation to indicate that they have established affiliations with institutions in Mauritius with adequately skilled manpower to provide maintenance support
6	**Exclusions** Information on harmful substances	Does not contain lead, mercury, cadmium, hexavalent chromium compounds, to the utmost extent possible. If present, the maximum permitted concentrations in the PCs / laptops should not	Bidders must clearly specify the part, and clearly list the extent of the following substances: lead, mercury, cadmium, hexavalent chromium and certified by a recognized body.

#	Sustainability Criteria	Requirement Definition	Verification Guidance
		exceed 0.1% or 1000 ppm (except for cadmium, which is limited to 0.01% or 100 ppm) by weight.	Any Type I ecolabel which includes this or equivalent criteria shall be accepted.
7	**Packaging** Exclusion of PVC	The packaging of the product shall not contain PVC	Any appropriate means of proof demonstrating that the criteria are met will be accepted, such as a technical dossier from the packaging manufacturer or a declaration from the PC or laptop manufacturer along with a certificate from a recognized body stating explicitly the absence of PVC in the material.
8	**End of life, disassembly, recycling and disposal**	The vendor must provide an end-of-life take-back guarantee	Bidders must provide appropriate proof of its capacity to secure the environmentally-friendly and social-responsible re-use, recycling and/or disposal of end-of-life PCs / laptops

Table 8: Sustainability Criteria Required from Suppliers for Printers

#	Sustainability Criteria	Requirement Definition	Verification Guidance
1	**Resource Conservation**	Printers with a maximum operating speed of more than 45 sheets per minute for A4 size paper must be equipped with automatic double-sided copying (a duplex-unit). All other devices with a lower maximum operating speed must at least offer an extra software-based option for double-sided printing on A4 size paper.	Any appropriate means of proof, such as a technical dossier of the manufacturer or a test report from a recognized body demonstrating that the criteria are met will be accepted

#	Sustainability Criteria	Requirement Definition	Verification Guidance
2	**Energy Consumption** Minimal power consumption during operation and standby mode	All products must meet the latest ENERGY STAR® or equivalent criteria for energy performance	All products carrying the ENERGY STAR label will be deemed to comply. Any other appropriate means of proof, such as a technical dossier of the manufacturer along with a test report from a recognized body demonstrating that the criteria are met will also be accepted.
3	**Warranty and Durability** Minimum 3 years of warranty and availability of replacement parts for the printers	Bidders must provide a guarantee for a period of at least 3 years or [x] pages, whichever occurs first. An option to extend the warranty period to 5 years may be given at additional cost.	Bidders must provide a written guarantee that this criterion will be met.
4	**Maintenance** Printers need to have locally available maintenance support	Bidders must ensure maintenance support for at least 3 years such that the printers warranty remains intact	Bidder must provide appropriate documentation to indicate that they have established affiliations with institutions in Mauritius with adequately skilled manpower to provide maintenance support
5	**Guarantee of availability of consumables**	Consumables should be available for at least 3 years from the time the printer is delivered	Bidders must provide a written guarantee that this criterion will be met.
6	**Exclusions** Information on harmful substances	Does not contain lead, mercury, cadmium, hexavalent chromium compounds, to the utmost extent possible. If present, the maximum permitted concentrations in the printers should not exceed 0.1% or 1000 ppm (except for cadmium, which is limited to 0.01% or 100 ppm) by weight.	Bidders must clearly specify the part, and clearly list the extent of the following substances: lead, mercury, cadmium, hexavalent chromium and certified by a recognized body. Any Type I ecolabel which includes this or equivalent criteria shall be accepted.

#	Sustainability Criteria	Requirement Definition	Verification Guidance
7	**Packaging** Exclusion of PVC	The packaging of the product shall not contain PVC	Any appropriate means of proof demonstrating that the criteria are met will be accepted, such as a technical dossier from the packaging manufacturer or a declaration from the printer manufacturer along with a certificate from a recognized body stating explicitly the absence of PVC in the material.
8	**End of life, disassembly, recycling and disposal**	The vendor must provide an end-of-life take-back guarantee	Bidders must provide appropriate proof of its capacity to secure the environmentally-friendly and social-responsible re-use, recycling and/or disposal of end-of-life printers

8.5 Implementation notes

8.5.1 On Prequalification

Compliance with environmental legislation

Where appropriate, the contracting authorities should ask bidders to supply relevant documents and, where they have doubts concerning the status of the bidder, they may seek the co-operation of the competent authorities.

The exclusion of such economic operators should take place as soon as the contracting authority has knowledge of a judgement concerning such offences. If national law contains provisions to this effect, non-compliance with environmental legislation or legislation on unlawful agreements in public contracts which has been the subject of a final judgement or a decision having equivalent effect may be considered an offence concerning the professional conduct of the economic operator concerned or grave misconduct.

8.5.2 On Requirement definitions

Recognised Body

Testing laboratories and certification bodies that are recognised by the National Accreditation Agency of the country of origin or an International Accreditation Agency which is member of International Laboratory Accreditation Cooperation (ILAC) or International Accreditation Forum (IAF) shall be treated as Recognised Body. In case of ambiguity, the opinion of Mauritius Accreditation Service (MAURITAS) may be obtained.

Requirement or evaluation criteria

If the purchasing/contracting authority is unsure about the price and availability of products meeting the requirement definitions in the local market, the above Specifications can be used instead as Award/Evaluation criteria. Where a points based evaluation system is used, these criteria could, for example, be given a 15% weighting in the final evaluation.

9   Life Cycle Costing

A growing number of authorities are using LCC and best value assessments to help ensure the products they are purchasing are making the best use of public budgets, or in the case of the United Kingdom representing the highest value for money (VFM). LCC is used at various points in the standard-setting, tender development, and bid evaluation process[24].

At the award stage (bid evaluation stage) of procurement, cost of a tender is generally one of the most important factors. However, "cost" includes much more than the purchase price quoted in regular procurement tenders. Costs which will be incurred during the lifetime of the product or service are equally important and are taken into consideration when doing "Life cycle costing". These life cycle costs comprise:

- Purchase price and associated costs – delivery, installation, commissioning etc

- Operating costs – energy/ fuel/ water consumption, spares, and maintenance

- End-of-life costs – like decommissioning or disposal

LCC may also include the cost of negative externalities (E.g. Greenhouse gas emissions).

9.1   LCC and environmental considerations

Using LCC in evaluating tenders will ensure that costs of resource use, maintenance and disposal are taken into account, as these are additional to the purchase price. This will be a winning proposition for the procurer as such an evaluation more often finds that the greener product is cheaper on the whole. A brief on the areas of life-cycle cost savings are given below:

Energy and water savings

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[24]The LCC section in these Guidelines have been drawn from UNEP Guidelines, EC Europa Buying Green handbook and ESMAP's Public Procurement of Energy Efficient Products: Lessons FromAround the world (2012)

Costs of energy and water consumption during the use phase, account for a large share of product lifecycle costs as well as a large share of life cycle environmental impacts.[25] Consequently, it is a win-win situation on both monetary and environmental fronts if this consumption is reduced.

<u>Savings on maintenance and replacement</u>

Sometimes the greenest alternative is one where the period until replacement is longer and maintenance requirements are lesser. In other words, the lifespan of the product must be comparatively longer and durability or assembly of the product designed for less maintenance. This would translate into lower total lifecycle costs.

<u>Disposal cost savings</u>

Disposal costs are tend be left out when regular procurement tendering is done. This may cause a good bargain to turn into an expensive buy. Costs of disposal comprise physical removal and secure disposal, especially if there exist stringent government regulations on disposal of certain kinds of materials in products. If recycling options are available, then there may be an opportunity to make profits from using recycled material.

9.2 Assessing external environmental costs

Apart from the above monetary costs directly borne by the procurer, there are environmental externalities which could be taken into account. Externalities are the costs borne by society for environmental damage like pollution of a water body or acidification. The difficulty with accounting for externalities is monetizing them i.e. assigning them a financial value. Only then can they be evaluated along with other costs to determine the best offer.

9.3 Applying LCC in procurement

Many public authorities in Europe have begun using LCC in determining the lowest lifetime cost when evaluating offers. In order to conduct LCC in procurement, certain issues require consideration:

- <u>Product lifespan</u>: A cheaper product that requires frequent replacement might cost more in the long run than an expensive but long lasting product. Therefore, when deciding the number of years over which life cycle cost comparisons are done, this point must be kept in mind.

- <u>Discount rate:</u> Takes into account the time value of money i.e. an amount of money available today is worth more than the same amount of money available in future as it can earn interest over time. The discount rate is usually taken to be the national interest rate[26]. By applying it to future costs, it helps determine the present value of those future

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[25]Can vary depending on the kind of product. For e.g. Furniture is not an energy or water consumptive product during use phase unlike IT equipment.

[26] Adapted from Investopedia – Definition of Discount Rate

costs – Net Present Value (NPV). In this way, a comparison of present and future costs can be done which is important in life cycle cost comparisons.

- <u>Data availability and reliability</u>: As lifecycle costing needs inputs on costs to be incurred in future (E.g. for maintenance, energy consumption, the product's actual lifespan), there exists an aspect of unpredictability. Hence, bidders must be asked to produce detailed information on cost estimations. For those future costs within control of the supplier (E.g. if they handle maintenance or disposal), maximum limits of the future prices can be laid out. By this, greater certainty can be factored into LCC calculations.

9.4 Using LCC for ICT equipment procurement

For ICT equipment procurement in Mauritius, the main elements of life cycle costs to be considered are – (i) the purchase price, (ii) energy consumption cost during use, (iii) materials / consumable consumption cost during use and (iv) cost of the disposal of the equipment.As with any electricity-using product, purchasing energy efficient models is generally a win-winoption – reducing running costs, and also reducing environmental impacts. Generally, theenergy efficiency of the product also has relatively little impact on the purchase price.

The LCC tools publicly available are:

— The DEEP Toolkit – Supporting Public Authorities in Energy Efficient Procurement - Developed by **ICLEI** – Local Governments for Sustainability, this toolkit includes an LCC analysis tool (excel based spreadsheet) and covers issues such as: energy and water consumption, maintenance and replacements. For more information or to download the tool visit: http://www.iclei-europe.org/index.php?id=4650

— A tool for assessing both LCC andCO2emissions in procurement,developed within the SMART-SPP project:http://tool.smart-spp.eu/smartspp-tool/registration/login.php

— An LCC tool developed within the BUY SMART project:http://www.buy-smart.info

9.5 Life Cycle Costing for ICT in Mauritius

The method for computing life cycle cost (LCC) of a PC/ Laptop and printer described in the subsequent sections shall be used by the Purchaser for evaluating bids. This method has been developed considering the phases of the life cycle during the ownership of the PCs/ Laptops and printers with the Purchaser.

The method for evaluation of LCC of a PC/ Laptop and goods described below shall be applied to these goods with identical specifications. For PCs/ Laptops and printers with different specification, the method shall be applied for each different type and added to derive the total LCC of the lot to be purchased.

9.5.1 LCC for PCs and Laptops

1.	**Acquisition Cost** *(as submitted by Bidder)*	_____MUR per PC or Laptop ------------------**(I)**
2.	**Life of PC/Laptop** *(as defined by Purchaser for LCC purpose)*	5 years
3.	**Average electricity price increase in % (i)**	*10% or [insert rate as defined for Mauritius]*

4. Warranty Extension *(beyond 3 years)*

Cost for Year 4=_____MUR per PC or Laptop

Cost for Year 5=_____MUR per PC or Laptop

For Bidders which do not provide additional warranty upto 5 years, one and a half times of the highest warranty cost submitted by any Bidder shall be added to the price bid for evaluation purposes only

Total Cost of warranty extension = _____MUR per PC or Laptop *(as quoted)* ---**(II)**

Or

Penalty Cost of Warranty = highest cost of warranty submitted amongst the Bidders x 1.5

5. Cost of Energy Consumption

The cost of energy consumption over a period of 5 years of operating the PC/ laptop for 6 hours a day and 22 days a month shall be computed.

Energy Consumption of the PC or Laptop (as submitted by the Bidder) = *[Y]* kW/hour

Energy consumed by a PC/ Laptop in a year	= 5 years x 12 months x 22 days x 6 hours x 'Y' = 7920 Y kW

Items	Year 1	Year 2	Year 3	Year 4	Year 5
Cost of 1 kW/hour of energy	C_1	$C_2=C_1(1+i)$	$C_3=C_2(1+i)$	$C_4=C_3(1+i)$	$C_5=C_4(1+i)$
Cost of energy consumed per year	$7920\ Y\ C_1$	$7920\ Y\ C_2$	$7920\ Y\ C_3$	$7920\ Y\ C_4$	$7920\ Y\ C_5$

Total Cost of Energy Consumed = $\sum 7920\ Y\ C_n$--**(III)**

6.	**Cost of end-of-life disassembly,**	The disposal cost of a PC (including monitor, keyboard, CPU and mouse) at the end-of-life =_____MUR

recycling and disposal	The disposal cost of a Laptop (including laptop, battery, AC adapter and mouse) at the end-of-life =_____MUR --------(IV)
7. Life Cycle Cost (of a PC/ Laptop for 5 years)	**I + II + III + IV**

9.5.2 LCC for Printers

1. Acquisition Cost *(as submitted by Bidder)*	_____MUR per printer ------------------**(I)**
2. Life of Printer *(as defined by Purchaser for LCC purpose)*	5 years
3. Average electricity price increase in % (i)	*10% or [insert rate as defined for Mauritius]*
4. Inflation rate (r)	*[insert rate as defined for Mauritius]*

5. **Warranty Extension** *(beyond 3 years)*
Cost for Year 4=_____MUR per printer *(as quoted)*
Cost for Year 5=_____MUR per printer *(as quoted)*
For Bidders which do not provide additional warranty upto 5 years, one and a half times of the highest warranty cost submitted by any Bidder shall be added to the price bid for evaluation purposes only
Total Cost of warranty extension = _____MUR per printer *(as quoted)* ---**(II)**
Or
Penalty Cost of Warranty = highest cost of warranty submitted by any Bidder x 1.5

6. Cost of Energy Consumption
The cost of energy consumption over a period of 5 years of operating the printer for 1 hour a day and 22 days a month shall be computed.
Energy Consumption of the Printer (as submitted by the Bidder) = *[Y]* kW/hour

Energy consumed by a printer in a year	= 5 years x 12 months x 22 days x 1 hour x 'Y' = 1320 Y kW

Items	Year 1	Year 2	Year 3	Year 4	Year 5
Cost of 1 kW/hour of energy	C_1	$C_2=C_1(1+i)$	$C_3=C_2(1+i)$	$C_4=C_3(1+i)$	$C_5=C_4(1+i)$

Cost of energy consumed per year	1320 Y C_1	1320 Y C_2	1320 Y C_3	1320 Y C_4	1320 Y C_5

Total Cost of Energy Consumed = $\sum$ 1320 Y C_n--**(III)**

Cost of end-of-life disassembly, recycling and disposal	The disposal cost of a Printer at the end-of-life *(as quoted)* =_____MUR--------**(IV)**

7. Cost of Consumables (cartridge/toner)

The cost of cartridges consumption over a period of 5 years for printing 500 pages a day and 22 days a month shall be computed.

Number of pages printed in one cartridge/toner (n) = _____ nos. *(as quoted)*

Items	Year 1	Year 2	Year 3	Year 4	Year 5
No. of cartridges/ toners consumed annually	$N_1=N_2=N_3=N_4=N_5$ = $\underline{(500 \text{ pages} \times 22 \text{ days} \times 12 \text{ months})}$ $\qquad\qquad n$ = $\underline{13200}$ $\quad n$				
Cost of cartridge/ toner	C_1	$C_2=C_1(1+r)$	$C_3=C_2(1+r)$	$C_4=C_3(1+r)$	$C_5=C_4(1+r)$
Cost of cartridges/ toners consumed annually	$N_1 C_1$	$N_2 C_2$	$N_3 C_3$	$N_4 C_4$	$N_5 C_5$

Total Cost of Energy Consumed = $\sum N_n C_n$ --**(V)**

8. Life Cycle Cost (of a Printer for 5 years)	**I + II + III + IV +V**

10 Relevant Ecolabels

There are a wide variety of labels available and also several classification schemes for labels defined by the International Standards Organisation (ISO)- Type I, Type II[27] and Type III[28]

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[27] Type II labels are self-declared environmental claims. They are not independently verified, do not use pre-determined and accepted criteria for reference http://www.globalecolabelling.net/what_is_ecolabelling/index.htm Accessed on 20 June 2013

[28] Type III labels are voluntary programs that provide more detailed quantitative information of products. It takes the form of a matrix and similar to declarations of nutritional characteristics of products. A "score" is given for the product for certain environmental impacts, based on LCA methods and by a third party certification agency. http://www.globalecolabelling.net/what_is_ecolabelling/index.htm Accessed on 20 June 2013

labels. **Type I labels**[29]are the most useful group for procurers because they are based on life-cycle environmental impacts and the criteria are set by an independent body and monitored through a certification or auditing process. Transparency and credibility is thus ensured by third-party certification.

Some of the Type I labels applicable to ICT equipment areENERGY STAR®, the German Blue Angel, Nordic Swan, Eco Mark Japan, EPEAT, the European Ecolabel, TCO, NIL, Terrachoice Ecológico, Environmental Choice Canada and the ECO IT declaration.For assessing compliance to a particular sustainability criterion, other Type I ecolabels that meet the criteria can also beaccepted as proof of compliance.

Following the recent revision of the ENERGY STAR® criteria for computers and imaging devices, which are aimed at the top 20-25% of products on the market, these standards are now being recognized as the international norm for highly efficient IT products. Many ecolabels adapt their criteria on energy efficiency in line with the ENERGY STAR® criteria. A comparison of the ecolabeling criteria for some of the PCs is presented in **Table 13**.

Table 9: Comparison of the key ecolabeling criteria for PCs

Energy Criteria	Energy Star 2007	Nordic Swan 2007	EU Ecolabel April 2005	TCO'05 Jul 2005	Blue Angel 2006	EPEAT
Sleep	4W	4W	4W	5W	4.5W	*
Off	2W	2W	2W	2W	2.5W	*
On/Idle	50-95W**	-	-	-	-	*

* *Same requirement as ENERGY STAR®*

** *Depending on category of PC*

For hazardous substances there is no direct way of comparing the ecolabels, especially for PCs/laptops. This is mainly because of the complexity of the criteria and because they are presented in different ways. For example, the ecolabels go into detail on different aspects of hazardous substances and for different components of a computer. However, the designated substances under the RoHS Directive[30] find common application across ecolabels. However, the ecolabel criteria (in many instances) tend to be slightly stricter than the values in the RoHS Directive. Additionally, other potentially harmful substances have been included in IT equipment which are not covered by the RoHS Directive such as beryllium, arsenic, phthalate esters and organotins.

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[29]They are according to ISO 14024 standard. Type I labels are a voluntary, multiple-criteria based, third party program that awards a license that authorises the use of environmental labels on products indicating overall environmental preferability of a product within a particular product category based on life cycle considerations. http://www.globalecolabelling.net/what_is_ecolabelling/index.htm Accessed on 20 June 2013.

[30]European directions on the Restriction of Hazardous Substances (RoHS Directive) 2002/95/EC

An element of commonality identified between various ecolabelsis in limiting the use of mercury in the background lighting of LCD monitors, which go beyond the restrictions set in the RoHS Directive, defining limits of 3 mg (Blue Angel & European Ecolabel) or 3.5 mg (Nordic Swan). All five labels included in the table above also prohibit the use of flame retardant substances and preparations in plastic parts above 25g assigned with certain risk phrases (carcinogenic, mutagenic or harmful to reproduction). The European Ecolabel goes further than the other labels as it also restricts flame retardant substances and preparations that are harmful to the environment.

The end of life behavior regarding ICT equipment in Europe and Japan is very much influenced by theirrespective WEEE Directives. The WEEE Directives puts the responsibility for the disposal of electrical and electronic equipment on the producer rather than the purchaser; however owners are responsible for bringing equipment to collection points.

The majority of the ecolabels also specify that the manufacturer shall offer, without any extra fee, the take-back for refurbishment or recycling of the product and for any component being replaced. Criteria are also specified for the easy disassembly and recyclability of equipment.

Office IT equipment is one of the product groups where there are rapid advances in technology and products and spare parts for products can quickly become obsolete.the issue of upgradability is relevant for ICT equipment. While processors, hard disk drives, graphics cards and other parts can be upgraded in PCs and laptops; monitors of these devises and printers can hardly be upgraded. The majority of ecolabels applicable to ICT equipment, including the Nordic Swan, Blue Angel, Eco Mark, Japan, EPEAT and the European Ecolabel, specify criteria for upgradability. These criteria are rather similar and concentrate on working memory expansion, installation, exchange and expansion of mass storage, installation and/or exchange of CD-ROM, DVD and hard disk drive and that the graphic cards are easily accessible.

Additionally the Blue Angel and Nordic Swan, for both computers and imaging equipment specify a five-year availability of spare parts to extend the life-time of products by limiting the need to have them replaced. This also applies to the EPEAT gold ecolabel.

11 Information Sources

- UNEP Sustainable Procurement Guidelines for Office IT equipments – Background Report; Product Sheets for Computers and Monitors and Office Imaging Equipments.

- European Commission GPP Training Toolkit –Office IT Equipments - Background Product Report and Product Sheet

- Agreement between the Government of the United States of America and the European Community on the co-ordination of energy-efficiency labelling programs for office annual

- Manual on 'Development of Framework Towards Standardized Assessment Criteria for Eco-Products and Eco-Services'; Green Purchasing Network India; 2012

- Blue Angel - Computers RAL-UZ 78, www.blauerengel.de/englisch/navigation/body_blauer_engel.htm

- Blue Angel - Office Printing Devices RAL-UZ 122,
  www.blauerengel.de/englisch/navigation/body_blauer_engel.htm

- Blue Angel - Reprocessed Toner Modules RAL-UZ 55,
  www.blauerengel.de/englisch/navigation/body_blauer_engel.htm

- Preparatory studies for Eco-design Requirements of EuPs (Contract
  TREN/D1/402005/LOT3/S07.56313): Lot 3 - Personal Computers (desktops and laptops)
  and Computer Monitors. Final Report (Task 1-8). IVF Industrial Research and
  Development Corporation,
  http://extra.ivf.se/ecocomputer/downloads/Eup%20Lot%203%20Final%20Report%20070
  913%20published.pdf

- EcoDesign of EuP Products: Preparatory Studies LOT 4: Imaging Equipment: Copiers,
  Faxes, Printers, Scanners, MFD, www.ecoimaging.org

- EPEAT, www.epeat.ne

- Nordic Swan – Personal Computers, version 5.0,
  www.svanen.nu/SISMABDesktopDefault.aspx?tabName=CriteriaDetailEng&menuItemID
  =7056&pgr=48

- Nordic Swan – Imaging Equipment, version 5.0,
  www.svanen.nu/SISMABDesktopDefault.aspx?tabName=CriteriaDetailEng&menuItemID
  =7056&pgr=15

- Eco Mark, Japan - Printers Version2.8; http://www.ecomark.jp/english/pdf/119eC2.pdf

- Eco Mark, Japan - Personal Computers
  Version2.11;http://www.ecomark.jp/english/pdf/122eC2_A.pdf and
  http://www.ecomark.jp/english/pdf/122eC2_B.pdf

- Green Purchasing Network Japan – Purchasing guidelines for Personal Computers;
  http://www.gpn.jp/English/guidlines/GL04.html

- Green Purchasing Network Japan – Purchasing guidelines for Copiers, Printers,
  Facsimile Machines; http://www.gpn.jp/English/guidlines/GL02.html

- TCO '05 – Desktops,
  www.tcodevelopment.com/tcodevelopment1200/Datorer/TCO05/TCO05_Desktopversion
  _1.0.pdf

- TCO '05 – Notebooks,
  www.tcodevelopment.com/tcodevelopment1200/Datorer/TCO05/TCO05_Notebook_com
  puters_version_2.0.pdf

- TCO '03 – Displays,
  www.tcodevelopment.se/tcodevelopment1200/Datorer/TCO03_Displays/TCO03_FPD_v
  ersion_3_0.pdf

- TCO '99 – Printers
  www.tcodevelopment.com/tcodevelopment1200/Datorer/TCO99/TCO99_Printers_2_1.p
  df

- Legal review for the implementation of Sustainable Public Procurement in Mauritius

- Mauritius Environment Protection (Industrial Waste Audit) Regulations 2008
  http://www.gov.mu/portal/sites/legaldb/files/IWA_reg08.pdf

- Mauritius Environment Protection (Standards for Hazardous Waste) Regulations 2001
  http://localgovernment.gov.mu/English/Legislations/Pages/Standards-for-Hazardous-waste-Regulations-2001.aspx

- Mauritius Dangerous Chemicals Control Act 2004
  http://ecolex.org/ecolex/ledge/view/RecordDetails;DIDPFDSIjsessionid=28F13A2A4D954B5F55140792288DF2AC?id=LEX-FAOC062529&index=documents

- Mauritius Employment Relations Act 2008

- Mauritius Employment Rights Act 2008
  http://labour.gov.mu/English/Documents/Legislations/Employment%20rights%20acts%202008/employment%20rights%20act%202008.pdf

12 Additional Guidance

- For more information on environmental labels and the use of environmental labels in the UN procurement process, please consult: "A Guide to Environmental Labels for procurement Practitioners of the United Nations system" published by UNOPS and UNEP (as part of the HLCM/SUN sustainable procurement initiative) (July 2009).

- United Nations Environment Programme (UNEP) (2006): EMG report on Sustainable Procurement in the UN System. Available at
  www.unemg.org/download_pdf/EMG11/SustProcurement.pdf

- The Procura[+] Manual 2nd edition: A Guide to Cost-effective Sustainable Public Procurement. ICLEI- Local Governments for Sustainability, Freiburg, Germany. 2007.

- Öko-Institut& ICLEI (2007): Study on costs/benefits of Green public procurement in Europe. Available at -

  http://ec.europa.eu/environment/gpp/pdf/eu_recommendations_1.pdf

- Kuehr, R.; and Williams, E. (2003): Computers and the Environment: Understanding and Managing their Impacts, Springer.

Annexure 1:
A Generic Comparison of Contents between Mauritian SPP Guidelines and UNEP SPP Guidelines

SPP Guidelines for Mauritius		UNEP SPP Guidelines		Remarks
Sec. Nos.	**Title**	**Sec. Nos.**	**Title**	
1. 1.1. 1.2. 1.3.	**Introduction, Scope and Methodology** Scope Methodology for Developing SPP Guidelines for Mauritius Structure	1.	Introduction and Scope	Sections 1.2. and 1.3. of Mauritian SPP guidelines do not have equivalent sections in the UNEP guidelines. Section 1.2. talks about the methodology that has been used in developing SPP Guidelines for Mauritius. Section 1.3. provides the differences in structure of Sustainability Criteria on SPP of each product category
2. 2.1. 2.2. 2.3	**Incorporating Sustainability in the Mauritian Procurement System** Public Procurement Act (PPA) 2006 Mode of Integrating Sustainability in the Procurement Process *Procurement Planning* *Requirement definitions* *Sustainability Evaluation Criteria* *Contract Management* Framework Agreements	2.	Incorporating Sustainability in the UN Procurement System Relevant UN Procurement Procedures Procurement Planning – Subject matter Requirement Definition – Specifications Sourcing – selecting environmentally and socially responsible suppliers and manufacturers Evaluation – using Life Cycle Costing and Bonus System Contract Review and Award – contract clauses	The section has been contextualised to the Mauritian Procurement System. The Section on Contract Review from UNEP guidelines has not been included in the Mauritian Guidelines. This will be taken up as a subsequent deliverable for the project where detailed analysis of the Standard Bidding Documents for each of the Product Categories will be conducted.
3.	**Institutional Enablers for Sustainable Public Procurement in Mauritius**	-	-	This section presents a review of the existing and proposed Policies, Strategies

SPP Guidelines for Mauritius		UNEP SPP Guidelines		Remarks
Sec. Nos.	Title	Sec. Nos.	Title	
3.1.	"Maurice Ile Durable" (MID) Policy, Strategy and Action Plan			and Programs that can stimulate SPP in Mauritius.
3.2.	National Programme on Sustainable Consumption and Production (2008 - 2013)			
3.3.	National Action Plan on Sustainable Public Procurement (SPP) for Mauritius (2011-2015)			
3.4.	Solid Waste Management			
3.5.	Facilitation of End-of-Life Disposal of Procured Items in Public Bodies			
4.	**Key Environmental Impacts**	3.	Key Environmental Impacts	The SPP Approach for Reducing Key Environmental Impacts has been reviewed and expanded from that included by UNEP.
4.1.	Elements and Potential Environmental Impacts(*specific to each product category*)	3.1.	Potential Environmental Impacts(*specific to each product category*)	
4.2.	Reducing the Key Environmental Impacts			
5.	**Key Social Considerations**	4.	Key Social Considerations	-
6.	**Legislations Impacting Procurement** (*specific to each product category*)	5.	Legislations Impacting Procurement(*specific to each product category*)	-
7.	**Framework for developing Sustainability Criteria**	-	-	This section has been specially included in the Mauritian SPP Guidelines. It describes how the Common Core Criteria developed by the Green Purchasing Network of India can be used as a framework to develop Sustainability Criteria for products towards public procurement.
7.1.	Background			
7.2.	GPNI's Common Core Criteria			
7.3.	Relevance and Applicability			
7.4.	Linking GPNI's Common Core Criteria to Prequalification Criteria			
7.5.	Linking GPNI's Common Core Criteria to Sustainability Criteria(*specific for each of the product categories*)			

SPP Guidelines for Mauritius		UNEP SPP Guidelines		Remarks
Sec. Nos.	**Title**	**Sec. Nos.**	**Title**	
8.	**Key Sustainability Criteria** *(specific to each product category)*	6.	Sustainable Procurement Criteria – Sources and Rationale	Section 8.2. of Mauritian SPP Guidelines matches Section 6. of the UNEP Guidelines.
8.1.	Procurement Planning			
8.2.	Developing the Criteria – Sources and Rationale			
8.3.	Verification Methods	7.2.	Verification methods	Section 8.3. of Mauritian SPP Guidelines matches Section 7.2. of the UNEP Guidelines.
8.4.	Sustainability Criteria and Verification Guidance *Prequalification Criteria Requirement Definition*			
8.5.	Implementation Notes *On Prequalification On Requirement Definitions*			All the other sections on Sustainability Criteria (8.1 – 8.5. of Mauritian Guidelines) matches the section heading given in the product sheets of UNEP. Key Sustainability Criteria have been contextualised to the Mauritian context.
9.	**Life Cycle Costing** *(specific to each product category)*	7.	Implementing the sustainable procurement criteria	Section 9 in Mauritian SPP Guidelines elaborates in detail on LCC as a concept and then talks about how it can be used for procurement.
9.1.	LCC and environmental considerations	7.1.	Using a lifecycle approach	
9.2.	Applying LCC in procurement			
9.3.	LCC for Passenger Cars in Mauritius			
10.	**Relevant Ecolabels** *(specific to each product category)*	6.1.	Environmental Labels *(specific to each product category)*	
11.	**Information Sources**	8.	Information Sources	-
12.	**Additional Guidance**	6.2.	Other Guidance	-