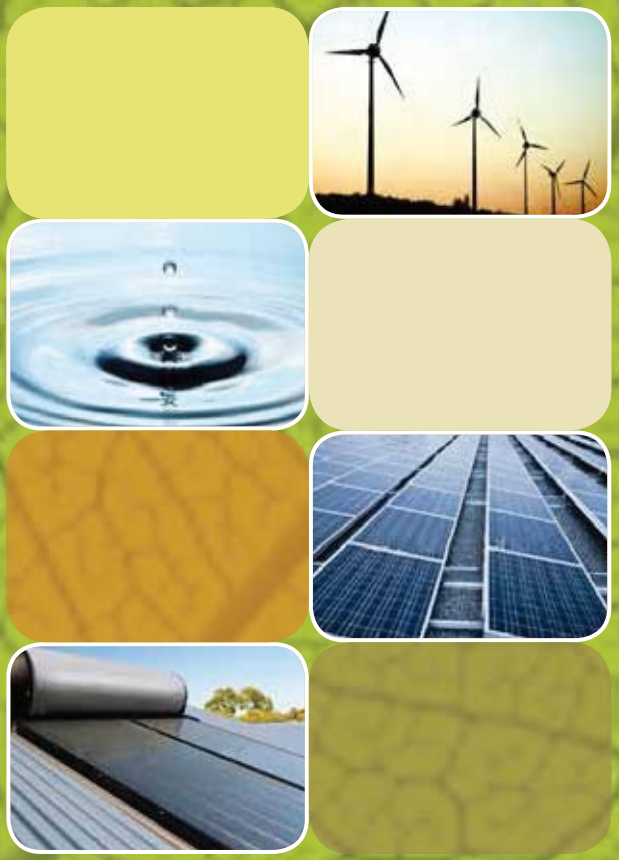
SUSTAINABLE CONSUMPTION AND PRODUCTION
BEST PRACTICES IN MAURITIUS



MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT
IN JOINT COLLABORATION WITH THE
UNITED NATIONS ENVIRONMENT PROGRAMME

UNEP
STOCKHOLM • NAIROBI • RIO • JOHANNESBURG
1972-2012: Serving People and the Planet

Acknowledgements

"The Ministry of Environment and Sustainable Development would like to express its appreciation to the United Nation Environment Programme, The United Nations Department of Economic and Social Affairs and also to all Ministries and Organisations which have contributed to the preparation of this booklet."

Environment - Mauritius

Ministry of Environment and Sustainable Development

Foreword by Minister of Environment and Sustainable Development

I am proud to be associated with the publication of the booklet on Best SCP Practices in Mauritius. This booklet comes at an opportune time. In fact, we will soon be witnessing the coming into operation of the Maurice Ile Durable concept, of which Sustainable Consumption and Production is an important component. The MID Action Plan and Strategic Plan which are forthcoming in the coming months aim at promoting sustainable consumption and production patterns.

It is worth noting that the Ministry of Environment and Sustainable Development had embarked on an SCP Programme even before the coining of the MID idea since we firmly believe that SCP paves the way to accelerating the transition to an eco-efficient economy. In line with the Johannesburg Plan of Implementation, signed at the World Summit on Sustainable Development in 2002, Mauritius is taking appropriate measures to promote resource and energy efficiency and sustainable infrastructure with a view to accelerating the shift from our present consumption and production habits to a more sustainable lifestyle.

In this context, I welcome the 10-Year Framework of Programmes (10 YFP) resulting from the Marrakech Process, the more so as Mauritius was selected as one of the pilot countries for implementing the 10-year framework. The 10 YFP aims at supporting regional and national initiatives to accelerate the shift towards sustainable consumption and production. It is supported and closely monitored by the United Nations Environmental Programme (UNEP) through regular global and regional expert meetings.

It is also a source of pride for the Ministry of Environment and Sustainable Development to have developed a National Programme on SCP which encompasses 44 projects to be implemented within a five year period, from 2008 to 2013, at a cost of Rs 35 million. Out of these 44 projects, some 24 are already being implemented and actions have been taken to initiate ten additional ones. Though most of the projects have taken off quite smoothly, two projects sectors, namely water and waste management, have encountered some difficulties. A local SCP consultant has been recruited to propose solutions for all barriers identified in the implementation course of the National SCP Programme. I have no doubt that these barriers will be overcome with the determination and the cooperation of one and all.

I would like to put on record my appreciation of the financial and technical support of international agencies, namely the United Nations Environment Programme (UNEP) and the UN Department of Economic and Social Affairs. My Ministry will leave no stone unturned to win the battle of Sustainable Consumption and Production. This is why we have set capacity building high on our agenda. In this context, my Ministry has organized a media workshop with a view to enrolling media people as partners so as to arouse consciousness of the Mauritian nation in adopting a new lifestyle with regard to Sustainable Consumption and Production.

Devanand Virahsawmy, GOSK, FCCA

MESSAGE FROM UNEP

The collaboration between the Government of Mauritius and UNEP on Sustainable Consumption and Production (SCP) dates back to 2007, when these partners decided to work together to develop tools for designing and implementing national SCP action plans. While UNEP concentrated on development of the tools and methodologies, Mauritius was the first country in Africa that embarked on this path to develop its own national SCP action plan.

The close collaboration between the Government of Mauritius and UNEP allowed the development of the Mauritian National Programme on Sustainable Consumption and Production, "Achieving more with less", which was approved by Cabinet in August 2008, and covers the period 2008-2013. UNEP has continued its partnership with Mauritius, providing assistance and advisory services in the implementation of the national action plan and during its mid-term revision process. UNEP commends the Mauritian Government for the substantial technical and financial resources that it has committed to this task and the impressive inter-ministerial coordination and new policies that have been developed as a result.

Mainstreaming SCP into national development strategies has become an international process, of which Mauritius is an integral part, together with countries such as Brazil, Vietnam, Burkina Faso, Ghana, Mexico and Croatia. Although significant efforts have been made at the international level it is still essential to present good practices and communicate the lessons learned from implementation at that national level in order to engage additional stakeholders, and more generally promote and guide the design and implementation of SCP policies. UNEP believes that many of the examples of policies and funding mechanisms to promote the transition to SCP embedded in this national action plan of Mauritius, and set out in this booklet, could provide valuable guidance for other countries setting out on the same course.

The good practices presented in this publication also show that SCP is a cross-cutting objective, the achievement of which has a direct positive impact on the environment, on productivity, job creation and poverty alleviation, which contributes directly to improving human welfare and climate change mitigation. UNEP hopes that this publication showcasing the policies and experiences of Mauritius will prove useful as the world prepares for implementing the Rio+20 decisions, a summit where the achievement of SCP, as both a key objective and as a prerequisite for sustainable development, was highlighted. The Summit also formally adopted the Ten Year Framework of Programmes on Sustainable Consumption Patterns (the "10YFP"), which represents one of the most concrete and operational outcomes from Rio+20. UNEP looks forward to working with the Mauritian Government and many others, to realize the full potential of the 10YFP to promote a global shift towards SCP.

Sylvie Lemmet, Director
Division of Technology, Industry and Economics
United Nations Environment Programme

table of content

introduction

Preamble

The world is facing deeply interlinked economic, social and environmental crises which result mainly from current unsustainable patterns of production and consumption. There is need to change the way goods and services are produced and consumed so as not to further aggravate the state of the environment, more specifically the disruption of the climate and the depletion of natural resources. The challenges lying ahead should spur us to innovation and creative solutions while encouraging us to scale up our efforts towards more sustainable lifestyles and policies. This shift to sustainable consumption and production patterns will be achieved through the full involvement of all stakeholders, namely Government, the business community, consumers, educators and the media. Each and every one of us is called upon to play an important role in this process of changing our mindset.

Mauritius has slowly but surely started to move in that direction. The aim of this booklet is to present some promising examples and to share information with all those who want to up-scale the effort and support this shift to SCP. The focus is on projects which have already been implemented .This list is far from exhaustive and you can contribute to the next update of this booklet by reporting your own initiative to the Ministry of Environment and Sustainable Development.

What is SCP?

Sustainable consumption and production (SCP) is a holistic approach to minimizing the negative environmental impacts resulting from uncontrolled consumption and production systems while promoting quality of life for all. Through a life-cycle perspective, SCP increases the sustainable and efficient management of resources at all stages of the supply-chain of goods and services (see Figure 1).

SCP offers opportunities such as the creation of new markets, green and decent jobs (e.g. markets for organic food, fair trade, sustainable housing, renewable energy, sustainable transport and tourism) as well as more efficient, equitable, and welfare-generating natural resources management. SCP encourages also the capture, the re-use and the recycling of valuable resources within waste streams. SCP aims at doing more with less by reducing resource use, environmental degradation, waste and pollution along the whole life cycle of goods and services, thus improving quality of life for all.

Achieving SCP requires a significant paradigm shift within the entire society. This means across-the board cooperation and involvement of all including policy makers, businessmen, traders, consumers, workers, researchers, scientists, media, civil society organizations and development cooperation agencies. SCP are the two legs on which sustainable development rests and offers the possibility for developing countries like Mauritius to "leapfrog" to more resource-efficient, environmentally sound and competitive technologies, bypassing inefficient and polluting phases of development.

The key principles of SCP are as follows:

1. Improving quality of life without increasing environmental degradation and without compromising the resource needs of future generations.
2. Decoupling economic growth from environmental degradation by reducing material/energy intensity of current economic activities; reducing emissions and waste from extraction, production, consumption and disposal; and promoting a shift of consumption patterns towards groups of services with lower energy and material intensity without compromising quality of life
3. Applying life cycle thinking, which considers the impacts from all life cycle stages of the production and consumption process;
4. Guarding against the rebound effect, where efficiency gains are cancelled out by resulting increases in consumption.

Figure 1: The life cycle of products and influencing factors. Policies, innovation, market forces and our values and lifestyles are factors that can all influence various stages of the life cycle.

Best Practices

Figure 2 shows the potential application of SCP policies and tools from a life cycle perspective.

Figure 2: Application of SCP policies and tools from a life cycle perspective

This booklet presents 30 case-studies on SCP. The first six case-studies present initiatives that create an enabling policy framework for SCP and the other case studies are presented from the life cycle perspective presented in Figures 1 and 2.


policies

The Maurice Ile Durable(MID) Fund

MIDF
Maurice Ile Durable Fund

For the past five years the National Budget has laid much emphasis on the greening of the economy and has made substantial provision for sustainable development projects, including energy efficiency, renewable energy, poverty alleviation and other social development projects. Thus, illustratively, to implement the Maurice Ile Durable (MID) vision, the 2008-2009 budget made provision for a MID Fund which supports efforts to protect the environment through recycling, encourages more efficient use of energy and increases the reliance on renewable energy.

The MID Fund was set up in June 2008 with a provision of Rs 1.3 billion ($40 million) with resources mobilized through taxes, government subsidies, development partners, carbon taxes and the private sector, including airlines offsetting their carbon emissions. Government introduced a token MID levy of 15 cents per litre on all petroleum products, 15 cents per kilo on LPG and 15 cents per kilo of coal. This levy was intended to partially finance the various grants to be provided by the MID Fund. In the 2011 budget, the MID levy on these products was increased to 30 cents. Government is replenishing the fund annually. The Fund was set up particularly to finance, among others:

- Projects to explore and harness all potential for local sources of renewable energy and to reduce dependency on imported fossil fuels.
- Programmes to reduce consumption of fossil fuels and achieve greater efficiency in the use of energy
- Projects and programmes to support efforts to protect the environment through waste recycling, to encourage more efficient use of energy and to increase reliance on renewable energy

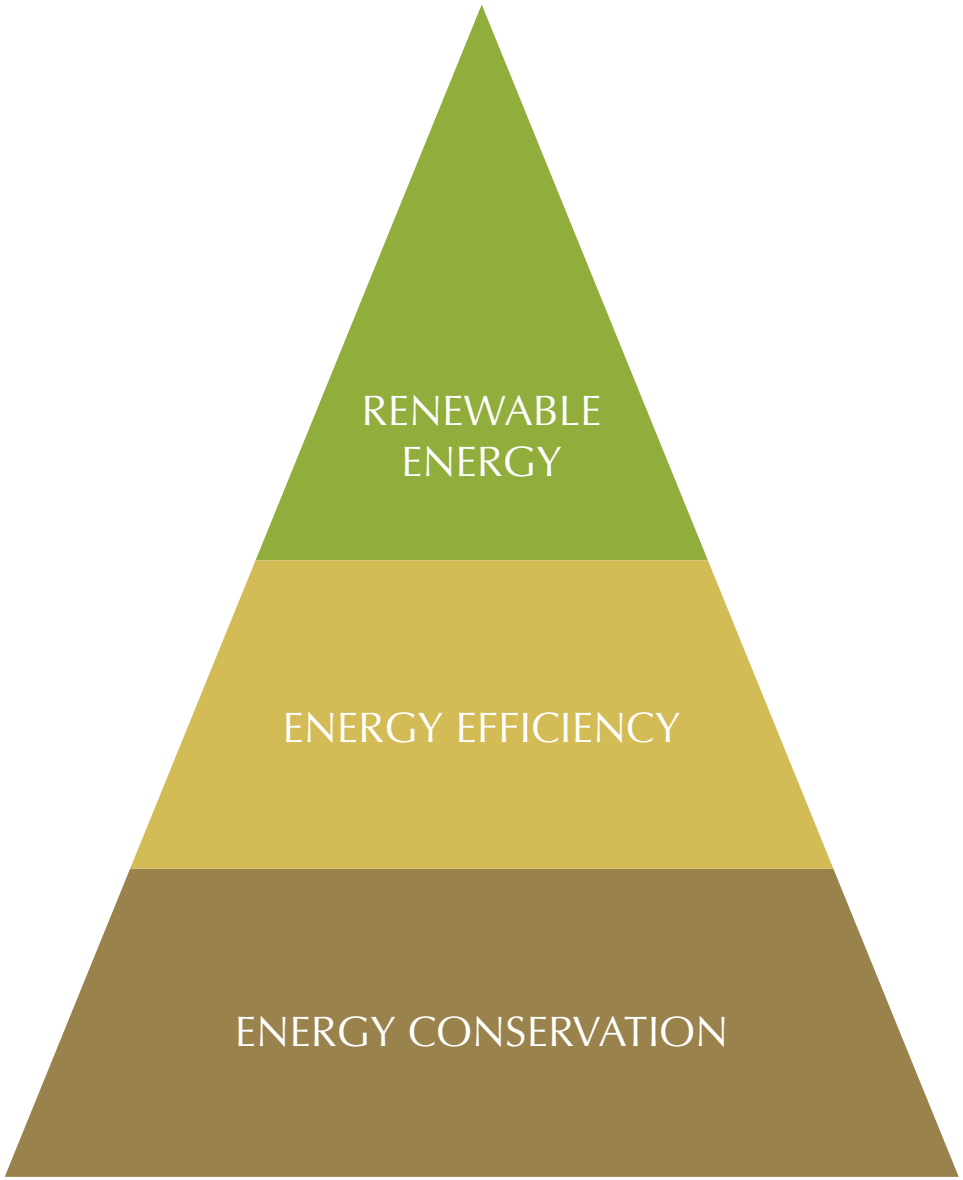
The MID Fund is therefore helping in changing unsustainable patterns of production and consumption. It is being replenished through the taxation of unsustainable practices such as the use of fossil fuels and is being used to provide incentives for the promotion of renewable energy (e.g. the solar water scheme) or energy efficiency measures such as the subsidisation of CFL lamps and installation of energy efficient lighting in public institutions.

The Energy Efficiency Act

With its high dependency on imported energy carriers (about 80% of the energy requirement is imported), Mauritius is very vulnerable to energy crises. Reliable and affordable energy has never been as important as it is today. Energy efficiency and the expansion in the share of renewable energy are high on the Government's agenda given the high importation costs of fossil fuels.

The share of fossil fuels in the total energy requirement increased from 62% in 1992 to 82.2% in 2007. Programmes for increasing efficiency and expanding renewable energy are thus not keeping pace with increasing demand and economic growth. The Energy Efficiency Bill which aims at reducing energy demand and improving the country's energy security, was voted in Parliament in April 2011. This Bill provides for the setting up of the Energy Efficiency Management Office (EEMO) for optimum use of energy in Mauritius. The EEMO is responsible for the formulation and implementation strategies and innovative financing schemes with respect to carbon credits, education and awareness raising on energy efficiency, regional and international cooperation and regulation of import of equipment on the basis of their energy efficiency level. Standards targeting appliances such as freezers, air conditioners, electric and microwave ovens, dryers, dish washers and electric water heaters will be developed by the office.

The implementation of the Energy Efficiency Act forms part of the National Energy Strategy which targets the reduction of energy consumption by 10 per cent by 2015. Besides enhancing energy security, decreasing importation costs of fossil fuels and reducing greenhouse gas emissions, energy efficiency measures will help in meeting the target of 35% of the electricity generation from renewable energy sources by 2025.



The Grid Code and Small Scale Distributed Generation Scheme (SSDG)

The SSDG project was launched in 2010 by the Ministry of Public Utilities and Renewable Energy and the CEB with a view to promoting clean energy in line with the vision of the Government to democratise the electricity grid. Through this initiative, Small Independent Power Producers (SIPPs) are given the opportunity to produce their own electricity from renewable energy sources such as solar photovoltaic cells, wind turbines and micro hydro power and export any excess to the CEB grid.

For the project to be technically feasible, the Government, with the collaboration of the United Nations Development Programme and the Central Electricity Board, formulated in April 2009 a Grid Code aimed at simplifying regulations governing grid-connected distributed generation. The Grid Code was developed so as to provide the technical framework for SIPPs with capacity below 50 kW to generate electricity for their own consumption and feed any surplus to the national grid.

The Grid Code allows for the integration of renewable energy generating technologies (limited to Hydro, PV and Wind) on the low voltage grid (230/410V). In addition, it puts in place a formal, transparent and non-discriminatory framework for the operation of the power sector. It also defines the rights and obligations of each party as regards to the planning, operation and management of the grid while establishing the standards of performance, safety and reliability required for the operation of the power system. A feed-in tariff/net metering has been developed to allow SIPPs sell any excess electricity to the grid at a premium rate. As at December 2011, about 250 SIPPs have registered on the scheme.

The SSDG project is in line with the Outline Energy Policy of Mauritius which favours the development of decentralized renewable energy generation systems by Small Independent Power Producers (SIPPs) such as households, businesses and schools. This initiative helps in reducing the nation's dependency on fossil fuels, thereby decreasing greenhouse gas emissions and enhancing energy resilience.

Carbon taxation for vehicles

A carbon tax is an environmental tax levied on the carbon content of fuels. Carbon is present in every hydrocarbon fuel (coal, petroleum, and natural gas) and is released as carbon dioxide (CO2) when they are burnt - which contributes to global warming. Since the greenhouse gas emissions caused by the combustion of fossil fuels are closely related to the carbon content of the respective fuels, a tax on these emissions can be levied by taxing the carbon content of fossil fuels at any point in the product cycle of the fuel.

Mauritius has now put in place a "CO2 tax" in addition to the excise duty chargeable on motor cars. A CO2 levy or CO2 rebate has been introduced around a dynamic CO2 threshold currently set at 158 gramme per km, which is the average CO2 emission of new motor vehicles classified as motor cars imported into Mauritius in 2010. The CO2 threshold will be reviewed in subsequent years to reflect the average pattern of import of new motor cars. The CO2 levy will be payable if the CO2 gramme per Km of a motor car exceeds the CO2 threshold of 158 CO2 gramme per Km.

The graduated CO2 levy is as follows:
+Rs 2,000 per gramme/km, for Cars from 159 to 190 CO2 grammes/km;
+Rs 3,000 per gramme/km, for Cars from 191 to 225 CO2 grammes/km;
+Rs 4,000 per gramme/km, for Cars from 226 to 290 CO2 grammes/km; and
+Rs 5,000 per gramme/km, for Cars above 290 CO2 grammes/km

The amount of CO2 levy payable is the difference between theCO2 gramme per Km of the motor car and the CO2 threshold of 158 CO2 gramme per Km, multiplied by the CO2 rate. On the other hand, a CO2 rebate is granted when the the CO2 gramme per Km of a motor car is below the CO2 threshold of 158 CO2 gramme per Km. In this case also a graduated rupee rates for CO2 Rebate is proposed as follows-
- Rs 3,000 per gramme/km, for Cars with up to 90 CO2 grammes/km; and
- Rs 1,000 per gramme/km, for Cars from 91 to 158 CO2 grammes/km.

This amount will be deducted from the excise duty payable. The amount of rebate that can be deducted is limited only up to the amount of excise duty that is payable. The CO2 levy or CO2 rebate system applies only to motor cars at this stage.

The introduction of the carbon tax will lead to a change in the consumption pattern promoting the use of more energy-efficient vehicles. This will help in enhancing energy security, decreasing greenhouse gas emissions and reducing importation costs of fossil fuels.

The Agence Francaise de Developpement (AFD)Green Lending Program

The implementation of the "Maurice Ile Durable" initiative necessitates increased private investments in the fields of sustainable energy and environmental performance. In that context, the Agence Française de Développement (AFD) has partnered with four commercial banks (the Mauritius Commercial Bank, the State Bank of Mauritius, the Mauritius Standard Bank and the "Banque des Mascareignes"), building on their capacity to drive and catalyze "green" investment decisions. The approach is to mobilize financial institutions for the funding of environmental performance investments.

The partnership sealed between AFD and those four banks materialized in 2009 with the implementation of a 40M EUR green credit line. Under this scheme, partner banks have been able to develop their environmental lending initiatives. These include customized loans, advisory services for clients and a grant (equal to 12% of the loan). Anyone (companies, individuals, association) having a green investment project which can be related to: (i) Renewable Energies ; (ii) Energy Efficiency ; (iii) Environmental Performance ; (iv) Eco businesses; can apply. In September 2011, nearly 40% of the credit line has been engaged (18 projects), and several projects are under consideration.

Since their inception, the Green Loan schemes of the various banks have attracted much interest and have the merit of encouraging companies to think about the introduction of cleaner technologies to reduce production costs, as well as CO2 emissions.

Levy on Plastic Bag

Each year, millions of discarded plastic shopping bags end up as litter in the environment when improperly disposed of. The same properties that have made plastic bags so commercially successful and ubiquitous — namely their low weight and resistance to degradation — have also contributed to their proliferation in the environment. Due to their durability, plastic bags can take centuries to decompose.

A major policy response taken to minimize the use of plastic bags has been the introduction of an economic instrument in the form of an excise duty on all plastic carry bags (local and imported). This was announced in the 2006-2007 budget speech. Plastic carry bags have thus been subject to a Rs. 1 excise duty as from July 2006 and Rs. 2 as from November 2010. In 2006, surveys following the introduction of the tax showed a drastic reduction in plastic carry bags consumption of the order of 75 to 80 % in supermarkets. The Ministry of Environment and Sustainable development is working on measures to further curb the use of plastic carry bags.

The primary purpose of the introduction of the levy is to reduce the consumption of disposable plastic bags by influencing consumer behaviour. Alternatives to disposable plastic shopping bags, such as reusable bags are now available in shops and the consumer attitude is gradually changing with an increasing willingness to adopt these alternatives.


sustainable production

The Saint Aubin Artisanal and Biological Integrated Operations “SABIO” Project

The Saint Aubin Group has launched an innovative initiative - the Saint Aubin Artisanal and Biological Integrated Operations (SABIO) project - aimed at providing maximum value to sugar cane through the development of a diversity of organic products.

Organic products such as bio-ethanol, bio-fertilisers, rum, molasses, sugarcane honey, industrial alcohol and jaggery and khandasary (special sugars considered better than refined sugar) form part of the project. SABIO also has a dimension that combines energy and agriculture. A bio-fertilizer can now be produced with the stillage from the distillation of cane juice and spread on the fields of the property. The use of bio-ethanol will eventually save between 20 and 40% of the diesel consumption and there is also a plan to produce biogas from stillage. The project includes an educational as well as a tourism component with the "Tea Road" tour already proposed by the group. A small factory and a museum have been recreated around the old chimney where visitors can follow all stages of cane processing. This project has significantly increased the tourism potential of the region has been developed, creating additional jobs while contributing to socio-economic development.

For the competitiveness of our sugar industry it is vital to make maximum economic use of the diversity of yield components of sugar cane including maximum use of by-products and the production of derivatives of high value such as organic products

Carbon Footprinting-MEXA Blue Carbon Label and Awards

The Blue Carbon Award is the natural extension of the Mauritius Blue Carbon Label recently developed by Mauritius Export Association (MEXA) in its endeavour to implement a carbon emission reduction project (CERP), to help its members understand the carbon footprints of the products, the sites and services they use.

MEXA has over the last two years hosted a series of workshops and seminars to guide export companies in their quest for carbon footprint reduction. MEXA has initiated the first ever Blue Carbon Award in 2010 to reward companies that have initiated actions towards carbon mitigation in their business practice. The first edition of the MEXA Blue Carbon Award Ceremony was held on 18 April 2011. Having demonstrated an absolute reduction of their footprint or equivalent relative efficiency improvement of more than 40 percent, the seven participating companies namely Consolidated Dyeing & Fabric Ltd, Ferme Marine de Mahebourg, FM Denim Ltd, RT Knits Ltd, T&T International Ltd, Tamak Textile and Poster Graphics received their blue carbon certification on that day for having significantly reduced their carbon footprint. Each company was independently assessed by an official assessor, Rexizon C.E. Ltd, a third party, for its carbon footprint at the end of each financial year, taking into account the Greenhouse Gas (GHG) Protocol.

The Blue carbon Award from MEXA serves as an important acknowledgment for companies that make sustainability work and carbon mitigation anchored business practice in Mauritius. The promotion of carbon footprint through a recognized Carbon Reduction Label will enhance brand reputation and sales appeal. Being a Blue Carbon awardee will help to put a business in-step with future policies that will have a significant impact on the domestic and the wider marketplace.

Energy Audits in Manufacturing Companies by Enterprise Mauritius

There is need for an efficient energy use in manufacturing enterprises which can constitute the foundation for energy management initiatives and investment decisions in more energy efficient equipment and renewable energy options. Enterprise Mauritius (EM) has funded consultancies for energy audits of manufacturing companies, promoting further investment in expertise and equipment and leading to more efficient operations and green productivity.

The audit reports highlight modifications in the present set up of the processes with investment in possible equipment wherever applicable. The recommendations for all the manufacturing companies audited have been geared towards water savings, electrical energy savings, energy savings from boiler operation and general investment measures, including energy efficient equipment as well as renewable energy utilization such as solar and wind energy. After taking stock of the energy reports, enterprises are developing an implementation plan, which includes restructuring as well as investment in machinery and equipment, in consultation with EM. Some of the proposed measures, notably the quick wins with negligible investment, have already been implemented in most of the companies audited.

The enterprises have found this exercise fruitful since, in some cases, there is no dedicated engineer for energy or environment management as it adds to their overhead cost. Based on the energy audits carried out through this project, these organisations may now work on the implementation of best energy practices. Enterprise Mauritius is seeking assistance from Development Partners to financially support the local SMEs in opting for renewable energy technologies as well as energy efficient processes.

Adoption of Green Productivity measures in industry, particularly in SMEs, will lead to immediate improvements in productivity as a result of increased efficiency gains in resource use, lower cost of production and lower environmental compliance costs. Other benefits include competitive advantage, a better working environment, better employee participation and team work and greater job satisfaction.

Cogeneration from Bagasse

The sugar cane plant is an agricultural crop with a high bioconversion efficiency to capture sunlight as a result of which a high amount of atmospheric carbon is fixed into biomass. Though the main interest of the plant until recently was to recover sugar from this biomass, it is now considered as a major renewable energy resource in many sugar cane producing countries. Cogeneration is the simultaneous production of electricity and process heat from a single dynamic power plant. A cogeneration power plant burns bagasse (the fibrous residue remaining after sugarcane stalks are crushed to extract their juice) to generate steam for process heat, and for driving a turbine to produce electricity. Mauritius is a leader in bagasse cogeneration and the country's sugar industry is self-sufficient in electricity and is able to sell the excess to the national grid.

Policy measures pertaining to energy generation from bagasse have led to the implementation of a number of projects on firm power (using bagasse during the crop season and coal during the intercrop season) generation as well as continuous power (using bagasse during the crop season only) generation. In response to these incentives and policies, the sugar industry has implemented a number of measures to efficiently use energy in sugar cane processing. Such measures include the enhancement of the calorific value of bagasse, reduction in power consumption in the prime movers of sugar manufacturing equipment, reduction in process heat consumption in juice heating and evaporation, adoption of continuous processes, factory computerisation and process automation.

Bagasse is a valuable energy asset for Mauritius and, since 1990, the contribution of bagasse in electricity production has increased from 52.5 GWh in 1990 to 353.6 GWh in 2009. It contributes to about 20% of the electricity generated on the island. It is to be noted that cane-processing companies such as Omnicane Ltd have now been designed to operate as flexi-factories, producing not only sugar but also electricity and bio-ethanol.

The implementation of cogeneration projects from bagasse in Mauritius has enabled the country to diversify its energy base, rehabilitate, modernise and centralise cane milling activities, save on the fossil fuel import and reduce the emission of greenhouse gases, mainly CO2.

Fair Trade Certification

The Fair Trade label is a scheme proposed by the Fair Trade Labelling Organization (FLO), an international NGO based in Bonn, Germany, so as to enable small producers to benefit from fairer and more equitable prices for their products. This is achieved through payment of a minimum price and/or a Fairtrade Premium by buyers of Fairtrade products.

The Mauritius Sugar Syndicate (MSS) has launched an initiative to encourage small and medium sugar cane planters to obtain the Fair Trade (FT) Label for the sugar they produce. The FT Premium is paid to the Mauritius Sugar Syndicate who acts as a paying agent and remits the FT premium to the grower cooperative in toto and for its exclusive benefit. The FT Label provides accredited cane planters with a Fairtrade Premium currently set at USD 60 or about Rs. 2,000 per tonne of sugar sold, which can be used to finance socio-economic projects aimed at enhancing the living and working conditions of these producers. Compliance with Fair Trade principles also ensures that planters adopt the best agricultural practices and as such promote sustainable development. The Mauritius Sugar Authority is assisting the Cooperative Credit Societies and other small planter entities engaged in sugar cane cultivation to acquire Fairtrade accreditation through payment of application fees, initial certification fees, consultancy fees and training fees. To date, five Cooperative Credit Societies have obtained the Fairtrade accreditation.

The Fair Trade certified labels guarantee that products are produced and traded in an economically, socially and environmentally responsible way. A fair trade label would clearly signify that a producer is committed to fair trade principles, including fair pay and working conditions, fair purchasing and sharing of benefits, and respect for human rights and the environment.

FORENA (Fondation Ressources et Nature) project for the production and certification of organic agricultural products

A product can be labelled "organic" when it has followed and complied with the specific rules for organic farming as set down in one of the sets of regulations recognised by the international community. To achieve this, all operators must undertake to be inspected by an independent accredited third party in accordance with the ISO 65 guide standards, such as Ecocert.

FORENA is a Foundation registered in August 2008 to promote sustainable development, sustainable livelihood practices, conservation and re-introduction of terrestrial and marine endemic and native biodiversity and mitigation of climate change. FORENA has implemented a project through Global Environment Fund - Small Grants Programme (GEF SGP) funding to assist four associations (Association de Parents d'Enfants Inadaptés de l'Ile Maurice (APEIM), Maison Familiale Rurale du Nord, Union Park Women Association and Association Nouvelle Découverte de Rodrigues) in cultivating organic fruits and vegetables, including medicinal plants certified by Ecocert. There are huge prospects for the production of organic foods in Mauritius with the increasing concern for fresh food among consumers and with the growing number of tourists visiting the country every year. The production of fresh organic cultivation can be envisaged as an agribusiness opportunity for unemployed women, young school drop-outs and professional farmers, thus reducing, at the same time, the volume of chemicals used in traditional cultivation practice, not to mention the resulting contamination of fresh water resources as well as the lagoon.

The project tends toward the review of the traditional way of vegetable and fruit cultivation, which uses quite a large amount of chemicals (fertilizers, pesticides, herbicides, etc) and to opt for a much more environment friendly technique which is organic farming and thus embark into sustainable agriculture for Mauritius. This project also helps in building capacity in sustainable agricultural techniques.

Wind Farm Project at Grenades, Rodrigues

Harnessing renewable sources of energy for power generation is one of the main concerns of Government in the quest to, as far as possible, substitute imported oil to meet the rising demand in electricity. In line with Government's commitment to foster the development of wind energy in Mauritius and Rodrigues, through the Maurice Ile Durable project, the Central Electricity Board has installed a wind park at Grenade in Rodrigues.

Grenade village was selected for the installation of four 275kW wind turbine generators because of its topology and as a result of wind measurement studies. The successful experience of the neighbouring Trèfles wind farm, where three 60 KW wind turbines equipped with tilting ability have been installed in December 2003, also prompted the choice of Grenade for the second wind farm project.

This project was divided into two phases with the commissioning of first two wind turbines in July 2009 and the remaining two in August 2010. The design of the wind turbines allows for the protection of turbine components during cyclonic winds. It also features 32m wide blades and 55m high tower and state of the art technologies such as hydraulic pitch system for speed and power control. The existing park has produced 2.3 GWh of electricity in 2011, which represents nearly 8% of the total electricity generation in the island. The CEB hopes to increase production by 10 to 12% shortly.

Wind energy is clean and renewable and is cost competitive compared to other fuel sources and it is the least expensive of all renewable energy sources. The cost is expected to continue to decline as the technology improves and the market for this source develops. Wind turbines also take up less space than the average power station and allow the land around the turbine to be used for many purposes, for example, agriculture.

Use of Coconut Oil and Used Oil for Energy purposes

The Mauritius Research Council (MRC) conducted a feasibility study in 2009, followed by a pilot project on using coconut oil and waste vegetable oil as substitutes to diesel for transportation.

The results were conclusive with one tractor presently running on coconut oil in Agalega and several 4x4 vehicles from hotels in Mauritius using waste vegetable oil as fuel. In line with the Maurice Ile Durable (MID) Project, the MRC, in collaboration with the Outer Islands Development Corporation (OIDC), initiated a project on the use of coconut oil as a substitute to Diesel. The ultimate goal of this initiative was to reduce the dependency of Agalega on Diesel by substituting the latter fuel with locally produced Coconut Oil to generate electricity. The study was carried out in collaboration with the Central Water Authority, the University of Mauritius, the Ministry of Public Infrastructure, NDU, Land and Shipping, and the Mauritius Standards Bureau, to name but a few. Indian Oil (Mauritius) Ltd sponsored the project by providing Diesel while OIDC provided Coconut Oil. The study entailed converting Central Water Authority's 60 kVA generator, situated at Ebène Pumping Station, to run on coconut oil and Diesel, filtering/cleaning of coconut oil and running the generator on full load with coconut oil and/or Diesel. It was found that coconut oil is a better fuel substitute than Diesel in terms of smoke emission, opacity and wear and tear. Coconut oil being suitable for electricity generation, it is now envisaged to transfer this technology to the Outer Islands.

Outer islands can rely on coconut oil as a renewable fuel source that is locally-produced, high-yielding, straightforward to process, and can be accommodated to a certain extent by existing diesel-based energy infrastructure. It is also environmentally friendly: not only is the burning of coconut oil carbon neutral, but its production and distribution can be done without significant emissions. On the other hand, recycling used oil not only conserves a valuable resource, but it also keeps our surface waters and groundwater supplies safe from potential contamination from improperly disposed used oil.

Cultivation and Propagation of Medicinal Plants by Association Pour L'Education des Enfants Defavorisés (Association for Education of Vulnerable Children, APEDED)

"Secret Grand-Mère" ('Grandma's Secrets) are some 15 copyrighted herbal teas prepared from medicinal plants by a group of twenty mothers of underprivileged children who are given free pre-primary education by the Non-Governmental Organisation, APEDED. The project has enabled these mothers to earn a living, thus contributing to the overall household budget while allowing them to provide their children with school materials.

These mothers have also received support from the UNDP GEF Small Grants Programme to cultivate, dehydrate, pack, and market a Mauritian brand of different medicinal and herbal teas which are sold in supermarkets and fairs at Rs 49 each. The income derived from this small scale business is shared amongst them. This project was also co-financed by the British High Commission, and received technical support from the Agricultural Research and Extension Unit of the Ministry of Agro-Industry.

The project was initiated in order to help poor women from low-income families overcome financial challenges. The beneficiaries were trained in understanding, cultivating and caring of medicinal plants in a small nursery that was set up on the roof of the pre-primary school. Additionally they were provided training in picking and dehydration techniques as well as packaging and marketing. Apart from the medicinal and herbal teas, these women now sell seedlings and plants as well.

Through this project, these women have thus been empowered in several ways. Another objective of the project was to revive the use of medicinal plants and motivate people to use traditional medicinal plants for relief from certain illnesses. This project contributes to people becoming more health conscious while helping in preserving the very sensitive biodiversity of the island.

Cleaner Production at Richfield Tang Knits Ltd (RT Knits)

Richfield Tang Knits Ltd (RT Knits) is a textile manufacturing company employing about 1600 employees with an annual production capacity of 16 million units of jersey wear. It has taken a whole set of positive measures to move towards "sustainable textile production," incorporating "Green Productivity Techniques" into a new factory situated at La Tour Koenig, near Port Louis. Using wind and solar energy, collecting rain water, and changing the company's perspective, RT Knits is an example and trend-setter for the local textile industry.

In building the La Tour Koenig facility (which includes an 800,000 sq. ft. factory built on 30 acres of land), RT Knits spent approximately 25 million USD on green features, including using solar and wind power in creative ways and collecting and reusing rain water. These innovations have resulted in a 30 percent reduction of the company's overall fuel consumption.

Buildings have been designed in such a way as to make use of renewable energies, e.g. make up building facing the north to exploit indirect soft sunlight instead of using tube lights and knitting block facing the South East Trade Winds for natural ventilation, thereby substituting the use of electricity to provide a comfortable and clean work environment. RT Knits has also installed on the main factory building more than 150 solar panels to heat water used in the dyeing process--reducing the use of fossil fuels for heating by 80 percent- and generation of hot water for dormitories which accommodate some 600 workers in instead of using LPG. Wind power is also being used directly in the factory through special vents installed in the wall facing the wind and that are manually opened and closed. The wind can be used to remove excess cotton that is produced during fabric processing--something usually done by electric fans or vacuums. LED lights (4 W) are placed on machines so that tube lights are not required during the day. Efficient T5 and CFL tubes replacing conventional tubes (56 kW) and LED Emergency lights are placed on the whole site.

Rain water is collected on the roof of the building and then converged to infiltration ponds connected to boreholes. The groundwater is replenished and avoids surface runoff and flooding to surrounding houses. The storage warehouse on the La Tour Koenig property is completely unplugged, using only natural lighting during the day and stored solar power at night. The on-site cafeteria, dormitory, and offices have all been constructed with windows that provide maximum natural lighting during daylight hours. Other environmental initiatives include constant monitoring of all dyeing processes to optimize the lowest possible use of chemicals, water, heavy fuel oil and LPG and using eco-friendly chemicals and dyes. Awareness raising sessions on energy conservation and protection of the environment are organized for employees, including distribution of solar water heaters and CFL.

What RT Knits gains through the implementation of these cleaner production measures are lower production costs, compliance with regulations, improved work environment, and positive press coverage of their environmental-friendly initiatives.


sustainable consumption &
lifestyles

Sustainable Public Procurement (SPP)

Sustainable public procurement (SPP) is a tool which allows Government to leverage public spending in order to promote the country's social, environmental and economic policies. Public procurement expenditure in Mauritius amounts to 20 percent of GDP. Government recognizes that procurement decisions by public bodies have inherent long lasting social, health, environmental and economic impacts. Several Ministries have initiated a few green procurement initiatives through the installation of CFL lamps in government buildings and in street lighting, the replacement of traffic lights by LED and the provision of solar water heater systems for some hospitals.

Since 2009, the United Nations Environment Programme (UNEP) has initiated a project aimed at supporting the development of SPP policies and the implementation of SPP in pilot countries including Mauritius. Government has agreed that Mauritius be one of the pilot countries for this SPP capacity-building project at the request of the Marrakech Task Force on SPP, led by Switzerland. The Procurement Policy Office (PPO), which operates under the aegis Ministry of Finance and Economic Development, has been identified as the enabler for implementation of the SPP project. Cabinet approved in November 2011 the Policy and Action Plan for the implementation of the Sustainable Public Procurement Project. The National Action Plan for Mauritius promotes and achieves sustainable public procurement in line with the Maurice Ile Durable vision and in accordance with Government's policy statement on the following themes: People; Policy, Strategy and Communication; Procurement Process; Supplier Engagement; and Monitoring and Reporting.

The following seven products/services that the action plan will focus on in the next five years have been selected: 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.

Government has to lead by example and, through SPP, commits to integrating sustainable criteria in the procurement process, to ensure all goods, works and services purchased deliver value for money, minimize environmental damage and maximize social benefits.

The Mauritius Commercial Bank (MCB) building at Ebene

A sustainable building is a structure that is designed, built, renovated, operated, or reused in an ecological and resource-efficient manner. Sustainable buildings are designed to meet certain objectives such as protecting occupant health, improving employee productivity, using energy, water, and other resources more efficiently, and reducing the overall impact to the environment.

The elliptical shaped nine-storey building of the Mauritius Commercial Bank is an iconic landmark in the Ebene business hub. This unique looking building was implemented according to a sustainability concept based on the principles of the British Research Establishment Environmental Assessment (BREEAM) method which is a rating system for buildings. Fundamentally, the latter addresses wide-ranging environmental and sustainability issues under the following headings: Management, Health & Wellbeing, Energy, Transport, Water, Materials & Waste, Land use & Ecology, and Pollution. The building is designed to accommodate 750 staff members and rests within a 6-acre landscaped garden. Creating a sustainable building has been one of the main drivers throughout the design process. It is expected to save as much as 32% energy compared to an ordinary building. The gross floor area is 12 710 m2 and the electrical energy consumption is estimated at 922 MWh per year, out of which 363 MWh will be from renewable energy sources. The per capita water consumption is 7.6 cubic metres per year and 35% of this water consumption will be from rainwater. Key sustainability aspects include:

- The building being oriented East and West with the low thermal transmission glazing facades facing North and South.
- A Thermal Energy Storage system (TES) provided to reduce the size of the chiller. The TES serves to absorb the peak cooling demands and to provide back-up cooling power for five hours.
- The air conditioning system as an All Air system providing excellent air quality and 'free cooling' during winter months when outside air temperatures are low enough. It allows the chiller to be switched off while maintaining comfortable conditions for the occupants.
- Natural light entering the building through the full height floor to floor of the vertical double glazing North and South facades and through five glass rings over portholes in the elliptical shell. Photometric sensors switch the lights on and off in the workspaces depending on the intensity of the natural light available. Both up lighting and task lighting are equipped with electronic ballasts on energy saving fluorescent lamps and LED lights.
- Rainwater drainage systems are hidden within the building cladding – this water is collected for use in toilets and for irrigation. The supply of potable water is restricted to the kitchen, wash hand basins and showers. The used water is recycled and stored with the rain water that is harvested from the building roof. This grey water is reserved for non-potable purposes such as landscape irrigation as well as the washing of the building and cars. It is estimated that 3 m3 of water will be recycled daily.
- Provision has been made to install a photovoltaic (PV) farm that will cover some 3000 m2 facing North and will generate on average 300 kW of electrical power which can be used to compensate for the electrical power consumed by the chiller (265 kW).
- From a general perspective, the elliptical shape of the building maximizes free floor space, with a remarkable floor plate efficiency of 91% being expected, and achieves visual connection between spaces to support a work-style that is more interactive and open, which can thus significantly contribute to the effectiveness of the office environment and amenity. Departments can also grow or shrink during the lifetime of the building without usual costs associated with change. All furniture and partitions are fully demountable.

By adopting sustainable building strategies, we can maximize both economic and environmental performance. Potential benefits of sustainable buildings include environmental benefits(enhanced and protected biodiversity and ecosystems ,improved air and water quality, reduced waste streams , conserved and restored natural resources), economic benefits (reduced operating costs , improved occupant productivity and optimized life-cycle economic performance) and social benefits (enhanced occupant comfort and health, heightened aesthetic qualities, minimized strain on local infrastructure and improved overall quality of life)

Long Beach Hotel

The Long Beach Hotel, member of the Sun Resorts Group, has been built on the site formerly occupied by Coco Beach Hotel. This new 255 room complex was viewed as an opportunity for the management to build a hotel that could use sustainable design and construction principles as well as incorporate sustainability principles.

Long Beach Hotel occupies a 59-acre site on the Belle Mare Peninsula, situated on the east coast. During Coco Beach's demolition, concrete, metal, cabling and plastic were sorted to avoid risks of pollution. Some items were sold off or recycled. About 20 000 m^3 of demolition waste were reused as infill on the site.

Considerable thought was given to efficient lighting. Before embarking on equipment purchases, designs were drawn up for the whole premises to produce a lighting plan adapted to genuine needs, for the most effective use of lighting to minimise electricity consumption. With its 6 000 energy-efficient light bulbs, compact fluorescent light bulbs and spots or LED lighting, the hotel has heavily invested in energy-saving measures. The saving in electricity usage at Long Beach is equivalent to the annual consumption of 500 households.

The roofs are covered with plants, pebbles and special materials to reduce the impact of sun exposure. This means cooler rooms needing less air-conditioning. The heat produced by the air conditioning system is captured and then used to heat water. The oil in the kitchen is recycled for reuse as fuel in vehicles. Ozone is used for laundry, which allows the use of water at room temperature instead of heated water, thus achieving significant energy savings. In the laundry unit, an ozonation process is used on the water, which means that lower washing temperatures can be used - 350°C instead of 600°C or 800°C.

A Building Management System (BMS) maintains the temperature of the rooms wisely. Photovoltaic panels produce electricity while rainwater is collected for irrigation and toilets. Waste water is also recycled to irrigate the gardens of the hotel. All washrooms at Long Beach are equipped with flow controls to optimise the water use without affecting the comfort of guests. The Hotel is expected to produce 150m^3 of green waste daily, some from the 59-acre site and some compostable waste from the kitchens, which is converted into fertiliser for the gardens. Refuse is also sorted, using bins with sections for plastic, paper and glass that can be recycled. To make the Long Beach construction project truly sustainable, the human dimension was also considered. An effective network of contacts was therefore built up with local small businesses and vegetable, seafood and other fresh produce suppliers.

Sustainable tourism is defined as tourism development that avoids damage to the environment, economy and cultures of the locations where it takes place. As this project has shown, environmentally friendly planning can produce considerable savings when thought of in terms of quality and durability.

Backyard and Roof Top Gardening

Mauritius is a net-food importing country with limited arable land. Food security is becoming a critical issue and innovative methods are needed to tackle food challenges in order to respond to future supply and demand.

"Back to Earth" is an initiative of the K-Force Foundation in close collaboration with the Movement for food self-sufficiency (MAM). Through this initiative, vegetable production at family level has taken off, sparking interest among young participants of Cité Barkly and Cité Chebel, Beau Bassin and their parents. Based on the concept of reducing the risk of food insecurity at family level, the project aims at making young people aware of the importance of environment as well as the potential of biodiversity in making one self-sufficient in agricultural foodstuff, thus becoming economically independent. The main challenge was to arouse among some 100 young people, living in town, a positive perception of working the land. Training sessions were organised followed by a distribution of seeds, compost, plant containers as well as agricultural kits including shovels, picks, rakes and watering cans. Young participants were grouped in teams for training, and regular visits allowed supervisors to monitor the progress of each participant. The backyard gardens allowed families, especially children, to eat healthily.

It is hoped that over time, the project will instill in the participants a harmonious relationship with nature and encourage them to adopt a new healthy lifestyle through a well-balanced diet.

Backyard and roof top gardening offers several benefits such as improving the family's health, saving money, reducing environmental impact, having outdoor exercise, building a sense of pride, ensuring food safety and security and reducing food waste. Moreover roof-top gardens can reduce energy demand on space conditioning, and hence reduce Greenhouse Gas emissions, through direct shading of the roof, evapo-transpiration and improved insulation values. They also help to improve storm water management, if sufficiently implemented in urban areas.

Environmental Programme in Schools

The Green Schools Project helps school children to know more about sustainability through living examples which they witness at school every day, so that they might adopt sustainable lifestyle and become eco-citizens when they leave school.

Sustained sensitisation campaigns in schools are being carried out on issues like water and energy conservation, composting, biodiversity conservation whereby primary and secondary school students are taught the basics of responsible behaviour. For example a major awareness raising campaign is being carried out in primary schools under the Green School Project of the Ministry of Environment and Sustainable Development (MoESD). School children are called upon to segregate their waste which is collected for recycling and composting purposes. To encourage the nurturing of endemic plants amongst the younger generations, the Ministry of Environment has also launched the School Endemic Garden on a national scale in all primary and secondary schools. The primary school Year 5 (Standard V) curriculum is being reviewed to integrate concepts related to Education for Sustainable Development and & Sustainable lifestyles.

The Green School Project of the National Productivity and Competitiveness Council (NPCC) known as the Green Productivity Programme is a learning-by-doing project which inculcates to secondary school students the notion of how to care about natural resources in the best possible way. The project involves not only students at school, but also the school staff, Parent Teachers Associations and, ultimately, the community. The objectives of the project are to improve resource use efficiency, facilitate the conversion of schools to green institutions and provide a platform for interaction and sharing of experience. A Green School Team comprising students, teachers, parents and administrative staff is established to co-ordinate the programme at school level. A Green School Champion is identified to lead the project and training is provided for the facilitators. The best projects are assessed and rewarded.

Achieving sustainable development requires individuals to adopt a more responsible approach – and education is the key starting point. Green schools programs help to develop responsible and green habits in our youth which will be with them for life.

Paperless Senate Meetings at the University of Mauritius

A paperless meeting is characterized by the absence of paper copies of the agenda, minutes, presentations or other documents. The goal is to decrease paper use by eliminating the practice of printing documents to hand out at meetings.

Paperless Senate meetings are currently being organized at the University of Mauritius: printed copies of agenda & supporting documents are no longer forwarded. Committee members are convened via email and supporting documents are uploaded on a Document Management System (DMS). The DMS is securely accessed by Senate Members for consultation/download of the documents. With a view to conducting paperless meeting in the Council and Senate committee room, the Centre for Information Technology & Systems installed the following equipment:

· one high end ceiling mount network video projector,
· one Wireless Presentation Gateway,
· a projector screen and
· a Wireless Access Point

Committee Members are encouraged to bring their laptop for Senate Meeting to consult documents pertaining to items to be discussed. However the University provides a few laptops on a 'first come first serve' basis. During the meeting, the item under discussion is projected on the screen. An audio system with recording capabilities and feedback has also been implemented in the Council and Senate room. According to the administration of the University, based on the number of meetings and committee members, this initiative has enabled the savings of about 140 000 A4 pages yearly.

The benefits of paperless meetings are as follows:
Saving paper = saving money and saving the environment.
Less paper = less chance that confidential information is left lying around after a meeting.
People can spend more time discussing or listening to a presentation instead of reading.
Less paper = more space in the work area and less clutter.
Less paper = reduced fire hazard and easier cleaning.

Energy Efficient Lighting

Lighting contributes significantly to energy consumption mainly during peak time hours. It is therefore considered as a good target for demand-side energy efficiency initiatives because of the prevalent use of inefficient lighting technologies, especially in the housing sector.

In 2008, the Central Electricity Board (CEB), with the financial assistance of the Maurice Ile Durable Fund (MIDF), embarked on the sale of one million compact fluorescent lamps (CFLs) to all its customers at heavily discounted prices. This initiative reduced evening peak demand by about 15 MW and enabled customers to save some Rs 5.59 per kWh, thus recovering their investment within one year. It is estimated that, through this initiative, energy demand decreased by about 12 million KWh per year. It is also estimated that some Rs 52 million per year were saved by reducing the importation of fossil fuels. CO2 emissions also reduced by about 14 000 tonnes annually. A sustained reduction of 15MW of the peak demand enabled the CEB to defer investment in additional peak generating capacity, which otherwise would have cost around Rs 400 million at current market price.

The MIDF is funding the replacement of street lighting in rural and urban roads as well as replacing all conventional lightings in public buildings, schools, hospitals. It has also replaced traffic lights by Light Emitting Diodes (LED) signal lights to the tune of about Rs. 13 M.Conventional traffic heads consume 70 W of power whereas the LED version consumes only 12 W on average. Moreover, LED lights have numerous advantages such as low maintenance cost, prolonged design life (11 years), better visibility and high light intensity. Total yearly financial savings amount to Rs. 4.6 M as a result of the reduction in electrical consumption for all newly converted traffic lights. The expected energy savings amount to about 636,000 kWh per annum, which represents about 80 % of the previous electricity consumption. The project has led to a payback period not exceeding 3 years.

At the end of the day, these energy-efficient lighting projects have been a win-win situation for all parties concerned. For consumers, it has been an opportunity to procure CFLs at heavily discounted prices while bringing about a reduction in their electricity bills. For the CEB, it resulted in important energy savings as well as deferred investment in peaking generating capacity. At national level, the CFL campaign has significantly helped in arousing the consciousness of the population in adopting a new mindset towards energy savings.

Solar Water Heater Loan scheme

According to available data from the Mauritius Meteorological Services (MMS), Mauritius, Rodrigues and Agalega enjoy a favourable solar climate with some 2 000 to 2250 hours of sunshine annually and an average solar radiation of 5.4 kWh/m2/day. This very good solar potential was instrumental in establishing the rationale for the Government to initiate the solar water heater loan scheme.

The grant program of solar water heaters began in 2008 and approximately 24 000 families had benefited from this project. The second phase of the scheme which followed the 2012 budget provides for a Rs 10 000 subsidy to households for the purchase of a solar water heater. For the good running of the scheme, registration of solar water heater suppliers has been made compulsory, taking into account their credibility, experience, customer care and after sales service as well as their technical capacity. The grant operates under the aegis of the Ministry of Environment and Sustainable Development and funding comes from the Maurice Ile Durable Fund.

This project has numerous sustainable benefits. Thousands of households would be getting hot water from a natural, renewable resource while contributing to reducing the importation costs of fossil fuels and avoiding the emission of greenhouse gases. It is also worth noting that beneficiaries are able to afford a monthly saving of some Rs. 4 000 - Rs. 11 000 per year, representing nearly a month's worth average salary. This will enable beneficiaries to use the savings for other household expenditure, benefit from a higher standard of living and therefore boost the local economy. Local industries involved in producing solar water heaters, accessories and fitting items also benefit from the scheme to acquire new technologies.

Rainwater Harvesting

A proven, cost-effective way of addressing water shortages is through the use of rainwater-harvesting (RWH) systems. A rainwater harvesting system collects water that falls onto the roof of a building for subsequent use in non-potable applications, such as toilet flushing, clothes washing machines, car washing and garden watering.

Water supply in Rodrigues varies between 4 500 m3/day in the dry period and 9 500 m3/day during the rainy season, which clearly indicates a water shortage during the dry period. A core issue regarding water is how to capture, store and distribute rainwater which is bound to become even more irregular due to inevitable climate change. Public awareness regarding rainwater harvesting is very high in Rodrigues. Many households have acquired fibreglass or concrete made tanks to store their water requirements. Many households in Rodrigues have much bigger storage tanks than Mauritians since they have been accustomed to store their water requirements for several days or weeks.

In Mauritius some rainwater harvesting initiatives have been undertaken following the recent deficit in rainfall in the past year. One such example is SPEED WASH LTD in Curepipe which has implemented a rainwater harvesting project for car washing since December 2008. Gutters have been installed on the roof of the company's building to collect rainwater from a surface area of some 250 m2. The gutter is connected to a 9000 litre storage tank which is linked to two other tanks, each having a 9000 litre storage capacity. The investment cost for the RWH system is around Rs 130,000. Maintenance of the storage tanks is done every six months while gutters are maintained as and when required. The RWH system is connected to a high pressure cleaning system and the amount of water used for washing a car is about 30 to 40 litres depending on the sate of dirtiness of the vehicle. The volume of water used by the machine is about 200 to 250m3 monthly to wash some 25 to 30 cars per day.

Government also encourages the use of RWH systems in public bodies such as schools and community centres. One such initiative is the project launched by the Ministry of Environment & Sustainable Development to provide RWH systems to all women centres by 2013. Women visiting these centres will thus take cognizance of the project and take the concept back home. In the long run, the rainwater harvesting initiatives will result in a decrease of potable water consumption and savings on the water bill.

Rainwater harvesting systems are simple to install, operate, and maintain. They are convenient in the sense that they provide water at the point of consumption and operating costs are negligible. Water collected from the roof catchment is available for use in non-potable applications such as toilet and/or urinal flushing, laundries, washings and site irrigation. Since rainwater is collected by using existing structures, i.e, the roof, rainwater harvesting has few negative environmental impacts.


waste management

Biogas Production from cattle waste

Installation of infrastructure for a pollution-free environment as well as an economical system of milk production has been the aim of the livestock keepers association in rural Mauritius. Through funding by the Small Grants Programme (SGP), the Livestock Keepers Association has implemented a project for the construction of biogas digesters to treat and recycle animal waste generated by the breeding activity of its members. The aim of the project is to produce biogas energy for cooking while improving living conditions.

10 digesters of 10 m3 each have been built for the treatment of cow dung to produce biogas energy for cooking and water heating. The effluent of the digesters is used by farms as fertilizer. A maximum of 10m3/day were produced depending on the volume of water used. About 1.5 m3 of biogas, which is sufficient for 2 to 3 hours of cooking, is generated daily. Thirteen women involved in cattle rearing have been trained in the use and the maintenance of the digester. The training sessions were conducted by officers of the Animal Production Division of the Ministry of Agro-Industry and Food security. They also provided technical support to the beneficiaries. It is to be noted that the problem of odours and fly nuisance, which constituted the most significant negative impact, has been totally solved. In addition, the methane from the cow dung which would have normally escaped into the atmosphere is now extracted and used as fuel. In addition, instead of using chemicals that leach into and contaminate groundwater, farmers have now an organic way of fertilizing their farms. This project is easily replicable, depending on space availability and topography of the land.

The most appealing aspect of this project is that it converts the waste of a breeding activity into valuable and useful products. Under normal circumstances, small-scale farmers like members of the Livestock Keepers' Association have little interest in preserving their environment. This project has the merit of reconciling economics with environment. By decreasing their cooking gas bill, farmers now obtain bigger income from their activity while at the same time protecting the environment.

Landfill Gas to Energy Project at Mare Chicose Landfill

Mauritius generates around 420,000 tonnes of solid wastes annually, most of which is disposed of at the Mare Chicose landfill. Landfilling of solid waste results in a series of complex reactions in which anaerobic microorganisms decompose a portion of the organic fraction of the waste into landfill gas (LFG). LFG consists of around 50-55% methane and about 40-45% carbon dioxide. Emissions of LFG into the atmosphere are of particular environmental concern, the more so as methane is one of the most potent greenhouse gases, being about 21 times more powerful at warming the atmosphere than carbon dioxide by weight.

The open flaring of LFG at the Mare Chicose Landfill, since the start of the operations in 1997, aimed mainly at mitigating emissions of LFG, more particularly methane emissions and reducing associated potential local impacts of odours, explosion or fire hazard and damage to vegetation. While the open flaring of LFG was a first step in mitigating LFG emissions, the possibility of using LFG as a renewable energy resource is another step to turn it into an asset.

In October 2011, Sotravic Ltée/Bilfinger Berger became the first Independent Power Producer to supply the Central Electricity Board (CEB) with energy produced solely from a renewable source. The plant will generate 110 million Kwh over the next five years. The process involves the conversion of LFG into energy by means of electrical generators. A Power Purchase Agreement (PPA) between the Central Electricity Board (CEB) and JV Sotravic Ltée/Bilfinger Berger was signed in July 2011. Government will benefit from 25 percent of the proceeds derived from the sale of the CERs (Certified Emission Reductions) under the Clean Development Mechanism (CDM) of the Kyoto Protocol upon approval of the project by the United Nations Framework Convention on Climate Change (UNFCCC). This 3 MW Gas to energy unit with an annual electricity generation capacity of 20 GWh (representing about 0.75% of the total electricity production) will result in significant environmental benefits, and is expected to bring about a total emission reduction of around 668 000 tonnes of carbon dioxide equivalent up to 2016.

The benefits of Landfill Gas to Energy are manifold: it helps destroy methane which is a potent heat-trapping gas; it generates renewable energy and offsets the use of non-renewable resources such as coal. It also helps to reduce local air pollution while creating jobs, increasing revenues, and favouring cost savings.

PET Bottle Recovery and Recycling – Extended Producer Responsibility in Mauritius

Recovery and recycling of PET bottles in Mauritius is a good example of enforcement of a government regulation on Extended Producer Responsibility (EPR) leading to stimulation of recycling.

The Ministry of Environment promulgated the Environment Protection (PET bottle permit) Regulations in 2001. In line with these regulations, bottling companies must encourage the return of used PET bottles and set up a collecting/compacting system so that the used PET bottles can be recycled and/or exported. In response to these regulations, the four big soft drinks producers, namely, Phoenix Camp Mineral (PCM), Quality Beverages Limited (QBL) and Compagnie Industrielle de Pailles (CIP), have set up the Mauritius Bottlers' Association which contracts out the collection, process and recycling of PET bottles to a private company called Polypet Recyclers Ltd. This company is actually responsible for purchasing used PET bottles from individuals, NGOs, schools and other organizations. Used pet bottles are collected, baled and sorted out by batch according to their colour. The used pet bottles are washed, granulated, re-washed and dried in specially designed machines. They are then ground and fed into other machines which melt them under sweltering heat and pressure. The PET waste is finally processed into pellets for export to South Africa. Since the coming into operation of Polypet Recyclers Ltd, up to 34% of the 3000 metric tonnes of PET used in Mauritius (approx. 80 million bottles) are being successfully recycled. This initiative has created about 100 indirect jobs, mainly PET collectors, and 30 workers are employed directly by the recycling company. Polypet Recyclers Ltd purchases PET bottles from its collectors at the rate of Rs 7.00 per kg.

Housewives from low income families have grouped themselves and move from house to house to collect used PET bottles as they receive a fair source of income in return.

The Extended Producer Responsibility concept generates many environmental benefits. It promotes recycling, thus reducing the amount of waste going to the landfill while increasing at the same time resource efficiency. The Bottlers' Association also promotes community initiatives with NGOs by creating an opportunity for local residents to obtain additional revenue by reselling PET waste.

Mobile Phone Recycling-Project: Je recycle les Mobiles et les Piles

Mauritius imports an average of 20 million batteries annually. The combined mobile telephone park in Mauritius amounts to more than 1.14 million. At the end of their normal lifetime, mobile phones and batteries are disposed of in open air thus representing a serious threat for our eco-system. Mobile phones and batteries contain harmful metals and chemicals such as nickel, cadmium, mercury, metal hydride and lead, which can contaminate the environment if not disposed of properly. Recycling of mobile phones and batteries helps in preventing pollution and in saving scarce resources.

Mauritius Telecom has initiated the project "Je recycle les Mobiles et les Piles" aimed at reducing the number of used mobile phones and batteries which are normally disposed of as municipal solid waste.

The project is being implemented under the aegis of the Ministry of Environment and Sustainable Development in collaboration with the Ministry of Local Government and Outer Islands and other partners, namely, the NGO Mission Verte, BEM Ltd and the Citadelle Rotary Club of Port Louis. Mauritius Telecom collects the used mobile phones and batteries and organizes their recycling according to local and international regulations. BEM Ltd is a private company specialised in the dismantling of electronic equipment. The dismantled components are regrouped in separate lots: plastics, electronic circuits, metals and batteries. These materials are then exported to foreign recycling companies. Collection boxes are available in shops, supermarkets, post-offices, government and private offices and other sites across Mauritius.

These boxes are also available in all post offices in Rodrigues. Collection boxes will be distributed to all primary and secondary schools in Mauritius and Rodrigues in the near future.

Recycling cell phones and batteries helps in protecting the environment by saving energy, conserving natural resources, preventing contamination and keeping reusable materials out of landfills.

Composting Projects

Characterisation studies having revealed that more than 60% of the country's average waste composition is of an organic nature, Government has decided to encourage the composting of solid waste.

The Ministry of Local Government has signed an agreement with Solid Waste Recycling Ltd (SWRL) in September 2011 for the supply of 90 000 tons of unsorted municipal waste each year for composting purposes. Following the presentation of the 2012 budget, an additional 100 000 tons of unsorted municipal waste was supplied to the SWRL composting plant situated at La Chaumière. Two other composting projects are in the pipeline: one at Cottage (55 000 t/a) and a second one at La Martinière (20000 t/a). They will cater for waste recycling in the north and south respectively.

Notwithstanding the centralized composting project, other programmes are underway for the use of domestic small scale composters by small planters and by the population at large. Under the Global Environment Fund-Small Grant Programme (GEF-SGP), a project has been implemented to demonstrate the feasibility of small scale organic compost production and its application to growing vegetables. Farmers can now use compost instead of buying expensive chemical fertilizers. This project will also result in the production of better-quality vegetables. Beneficiaries have reported increased shelf-life of vegetables and bigger sales yields.

In 2006, the Ministry of Environment and Sustainable Development launched the "School Compost Project" in some 40 primary schools in collaboration with various stakeholders. The scope of the project was later broadened to encourage sorting of other non-degradable waste. In this context, a "Waste Segregation Project" was launched in all primary schools in June 2010. The aim of this project is to inculcate in school children the waste sorting concept for recycling or composting. Labelled bins for collecting plastic bottles and paper wastes as well as compost bins for green wastes have been distributed to all the primary and secondary schools. The project has been extended to Rodrigues in January 2013.

Composting offers the obvious benefits of resource efficiency and creating a useful product from organic waste that would otherwise have been landfilled. Compost enriches the soil, helps to clean-up (remediate) contaminated soil and prevent pollution since the waste diverted from landfills ultimately avoids the production of methane and leachate formulation. Using organic compost offers economic benefits as it reduces the need for water, fertilizers, and pesticides and serves as a marketable commodity. Composting also extends municipal landfill life by diverting organic materials from landfills.