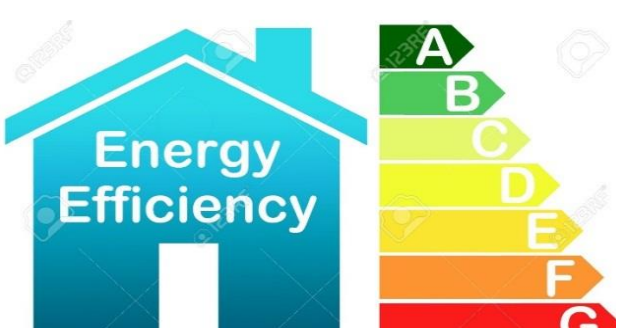
MINISTRY OF ENERGY AND PUBLIC UTILITIES

Annual Report

July 2016-June 2017



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List of Abbreviations

AFD	Agence Francaise de Developpement
BMF	Build Mauritius Fund
CEB	Central Electricity Board
CWA	Central Water Authority
EEMO	Energy Efficiency Management Office
IAEA	International Atomic Energy Agency
IWRM	Integrated Water Resources Management
KW	Kilowatt
MARENA	Mauritius Renewable Energy Agency
MEPU	Ministry of Energy and Public Utilities
MW	Megawatt
RPA	Radiation Protection Authority
URA	Utility Regulatory Authority
WMA	Wastewater Management Authority
WRU	Water Resources Unit

Foreword by Deputy Prime Minister, Minister of Energy and Public Utilities

I am pleased to present the annual report of my Ministry for 2016/17. This forms part of our commitment to good governance, transparency by sharing information with the population.

In 2015, when I took office, the energy, water and wastewater sectors were loaded with daunting challenges. In addition to catching up the delays inherited from the past, Government had to take bold decisions to steer the future of these vital sectors.

In the energy sector, we focused attention on ensuring a secure, reliable and uninterrupted electricity supply and on shifting towards cleaner energy sources. In addition to the implementation of the St Louis Redevelopment project, we have stimulated the growth of renewable energy. At the end of the financial year 2016/17, one wind farm and three new solar energy power plants were operating and six others were in the pipeline. New schemes were launched for the installation of rooftop solar PV by households, SME's and cooperatives and in commercial buildings. We introduced an innovative Home Solar project for the installation of rooftop solar panels on the houses of 10,000 families, who are in the social tariff category.

At the same time, in order to encourage energy efficiency, I introduced regulations for mandatory energy efficiency audits in Government institutions and mandatory labelling of three electric appliances.

In the water sector, Government allocated grants to the Central Water Authority for the replacement of old water pipes. During the period 2016/17, the Central Water Authority completed 14 projects for the replacement of about 127 km of pipes, costing Rs 1.1 billion. A new service reservoir of 2000 m^3 at Mont Blanc became operational in January 2017. The Bagatelle dam was completed in June 2017, mobilising additional water resources for the regions of Port Louis and Plaines Wilhems.

In the wastewater sector, the Wastewater Management Authority completed two projects in regions at Alfred Gelle, Plaine Verte and Marcel Cabon, Albion and contracts were awarded for eight sewerage projects, including former CHA estates. WMA introduced a framework agreement for house connections which reduced the time taken for house connections and cleared backlogs.

One of the most important achievements was the appointment in September 2016 of the long overdue Board of the Utility Regulatory Authority. The URA Act, though enacted in 2004, had remained dormant until 2016. This Authority will regulate the electricity sector, bring fair competition and protect consumers' interests.

I wish to express my appreciation to the staff of my Ministry, the units and departments and parastatal bodies falling under the aegis of my Ministry and the regional and international agencies for contributing to the modernization of the utilities.

Hon Ivan Collendavelloo, GCSK, SC,
Deputy Prime Minister,
Minister of Energy and Public Utilities

Introduction

The Annual Report provides an overview of the actions of the Ministry of Energy and Public Utilities and parastatal bodies falling under its jurisdiction during period July 2016 to June 2017.

The budget of the Ministry amounted to Rs 2.947 billion out of which Rs 2.700 billion was dedicated for capital expenditure. An amount of Rs 1.594 billion was provided for water supply projects and Rs 1.055 billion for construction of wastewater infrastructure.

In the year 2016/17, the Ministry completed the Integrated Water Resources Management Project funded by the Global Environment Facility. A National Indicator framework and a National Integrated Water Resources Management Plan were developed. Under a project funded by the Agence Francaise de Developpement, an Energy Efficiency Road map was prepared and approved by Government. The Ministry obtained approval of funding of 28 million USD from the Green Climate Fund for the project "Accelerating transformational shift to a low carbon economy", which it had submitted with the assistance of UNDP.

While developing strategies and policies, we have given particular attention to gender mainstreaming in the energy, water and wastewater sectors. Under an Integrated Water Resources Management Project, a gender consultant conducted training of senior officials and developed gender indicators for the water and wastewater sectors. Gender indicators were also prepared for the energy sector with the assistance of the Clean Energy Solutions of USA.

The Ministry gave administrative support to Mauritius Renewable Energy Agency and the Utility Regulatory Authority to set up their offices and administrative systems and procedures.

Nirmaladevi Nababsing
Senior Chief Executive
July 2019

The report

This Annual Report summarises major actions of the Ministry of Energy and Public Utilities for period July 2016 to June 2017.

Part I sets out the vision, mission of the Ministry, its roles and functions, its staffing and organisation structure as well as the staffing of parastatal bodies and departments/ units falling under its jurisdiction.

Part II highlights the achievements of the Ministry and the implementation of budget measures and implementation of capital projects.

Part III provides information on the financial performance of the Ministry.

Part IV is about the strategic direction of the Ministry.

Part 1 - The Ministry of Energy and Public Utilities

1.1 The Ministry

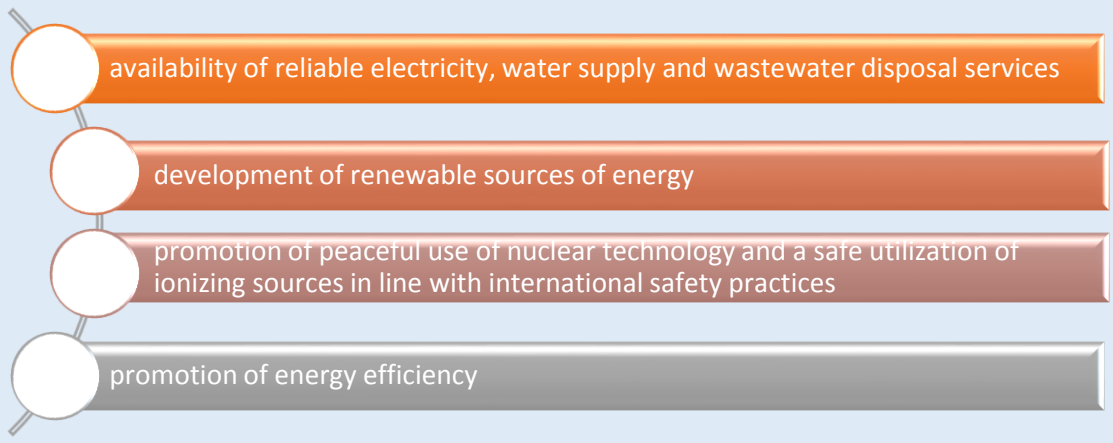
The Ministry of Energy and Public Utilities has the mandate to formulate policies and strategies for the energy, water, wastewater sectors and radiation protection and is responsible for the management of water resources in the country.

1.2 Vision

Ensure energy and water security, safe disposal of wastewater and peaceful use of nuclear technology and ionizing sources.

1.3 Mission

To fulfil our commitment to the nation, by ensuring-



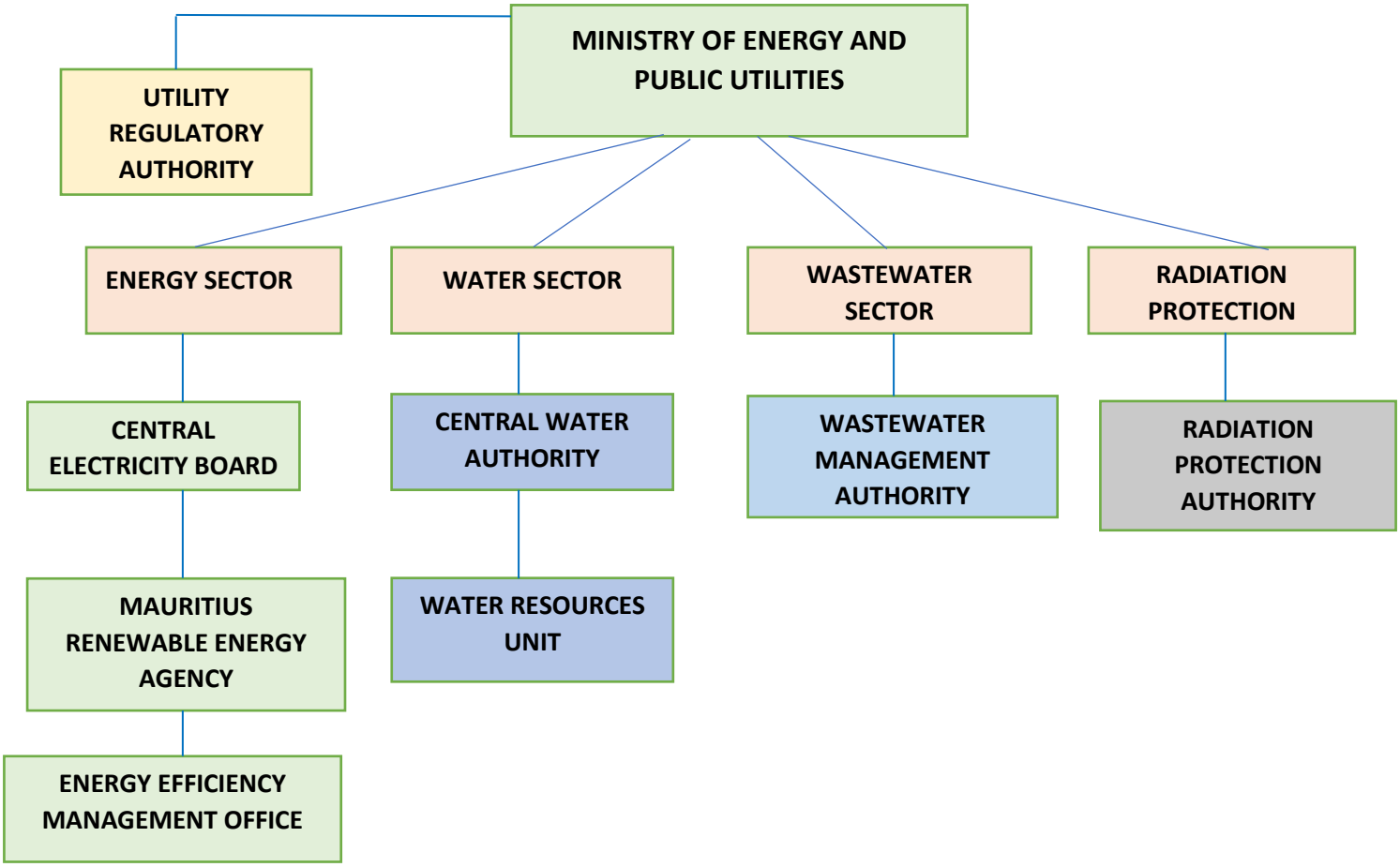
1.4 Functions

- Formulate policies and strategies for energy, water, wastewater and radiation protection
- Ensure that policies and strategies for these sectors are implemented
- Implement projects for the mobilisation of water resources such as construction of dams to meet the needs of the population
- Monitor the quality of water
- Assess water needs and determine allocation of water to different sectors and users
- Introduce legislation and implement projects to promote efficient use of energy
- Develop policies, strategies and projects for safe disposal of wastewater
- Implement policies, projects and international conventions for the peaceful and safe application of ionising radiation in the country.

1.5 Strategy and Policy

- *Long Term Energy Strategy 2009- 2025*
- *Energy Efficiency/ Demand Side Management Master plan and Action Plan 2017*
- *Mauritius Energy Sector – Assessment of Electricity Demand Forecast and Generation Expansion Plan with Focus on 2015-17 period- World Bank 2015*
- *Master Plan for Water Resources – 2013 -2050*
- *Mauritius Wastewater Master Plan- 2014-2033*
- *National Integrated Water Resources Management Plan – 2017*
- *Making the Right Choice for a Sustainable Energy Future: The emergence of a "Green Economy"- National Energy Commission 2013*

1.6 Units/Departments/ Statutory Bodies (as at June 2017)



UTILITY REGULATORY AUTHORITY

1.6.1 The Utility Regulatory Authority (URA) is an independent regulatory body to regulate utility services, namely electricity, water and wastewater, established under the URA Act 2004. Its objects are to:

(i) ensure the sustainability and viability of utility services;
(ii) protect the interest of both existing and future customers;
(iii) promote efficiency in both operations and capital investments in respect of utility services; and
(iv) promote competition to prevent unfair and anti-competitive practices in the utility services industry.

Its functions are to -

(i) implement the policy of Government relating to applicable utility services;
(ii) grant, vary and revoke licences in respect of a utility service;
(iii) enforce the conditions laid down in an undertaking authorisation;
(iv) regulate tariffs and other charges levied by a licensee in accordance with any rules specified in the relevant utility legislation;
(v) mediate or arbitrate disputes between a customer and a licensee, or between 2 or more licensees;
(vi) determine whether a licensee has an obligation to extend a utility service to customers or to an area not adequately supplied with such utility service;
(vii) establish an appropriate procedure for receiving and enquiring into complaints by customers in relation to any utility services;
(viii) establish and implement adequate systems for monitoring the compliance by licensees with standards and applicable regulations, and making such information publicly available;
(ix) take measures for the better protection of customers in relation to any utility services
(x) take measures to suppress any abusive, illegal or dishonourable practices in relation to any activity of a licensee
(xi) examine and make recommendations to a licensee in respect of any Power Purchase Agreement which a licensee proposes to enter into; and
(xii) examine and make recommendations to a licensee in respect of any management services contract, operation and maintenance contract or any other contract which a licensee proposes to enter into in relation to water services or waste water disposal services.

ENERGY EFFICIENCY MANAGEMENT OFFICE

1.6.2 The Energy Efficiency Management Office (EEMO) was established in accordance with the Energy Efficiency Act 2011. Its objects are to promote the efficient use of energy and promote national awareness for the efficient use of energy as a means to reduce carbon emissions and protect the environment. Its functions are to -

(a) develop and implement strategies, programmes and action plans, including pilot projects, for the efficient use of energy;
(b) establish procedures to monitor energy efficiency and consumption;
(c) issue guidelines for energy efficiency and conservation in all sectors of the economy;

(d) establish energy consumption standards;
(e) collect and maintain data on energy efficiency and consumption;
(f) compile and maintain a database for energy auditors;
(g) formulate and recommend innovative financing schemes for energy efficiency projects;
(h) devise and assist in the preparation of educational courses and school curricula on the efficient use of energy;
(i) establish links with regional and international institutions and participate in programmes pertaining to the efficient use of energy;
(j) encourage and assist project developers in applying for carbon credits for energy efficiency projects using the Clean Development Mechanism;
(k) devise, in collaboration with the Mauritius Standards Bureau, the Customs Department, the Mauritius Accreditation Service and the Consumer Protection Unit, and any other relevant authorities, minimum energy performance standards regarding any equipment, machine or appliance which is imported, manufactured or sold in Mauritius;
(l) devise labelling requirements and specifications regarding any equipment, machine or appliance which is imported, manufactured or sold in Mauritius;
(m) develop criteria to classify energy consumers; and
(n) prepare and submit to the Minister an annual report on energy efficiency and consumption.

MARENA
Mauritius Renewable Energy Agency

MAURITIUS RENEWABLE ENERGY AGENCY (MARENA)

1.6.3 The Mauritius Renewable Energy Agency (MARENA), established by the MARENA Act, 2015, has the responsibility to promote renewable energy and create an environment conducive to the development of renewable energy. Its objects are to-

(i) promote the adoption and use of renewable energy with a view to achieving sustainable development goals;
(ii) advise on possible uses of liquid natural gas;
(iii) create an enabling environment for the development of renewable energy;
(iv) increase the share of renewable energy in the national energy mix;
(v) share information and experience on renewable energy research and technology; and
(vi) foster collaboration and networking, at regional and international levels, with institutions promoting renewable energy.

CENTRAL ELECTRICITY BOARD

1.6.4 The Central Electricity Board (CEB),established by the Central Electricity Board Act 1963, is responsible for the control and development of electricity supplies in Mauritius. Its main function is to prepare and carry out development schemes with the general object of promoting, coordinating and improving the generation, transmission, distribution and sale of electricity in Mauritius and build generating stations. It also collects license fees on behalf of the Mauritius Broadcasting Corporation.

As at June 2017, the CEB was producing around 40% of the country's total power requirements from its four thermal power stations and ten hydroelectric power stations listed below-

Thermal power stations	Hydropower stations	IPP's
1. St Louis Power station 2. Fort Victoria Power Station 3. Fort George Power Station 4. Nicolay Power Station	1.Champagne Power station 2.Ferney Power station 3.Tamarind falls Power station 4.Magenta Power station 5.Le Val Power station 6.Cascade Cecile Power station 7.Amode Ibrahim Atchia Power station, Reduit 8.La Ferme Power Station 9. La Nicoliere feeder canal Power station 10. Midlands Power station	1.Consolidated Energy Limited 2.Alteo Energy Ltd 3.Terragen 4.Medine 5. OTEOSA (ex CTDS) 6. OTEOLB (ex CTSav) 7. Sarako solarfarm, Henrietta 8. Eoles de Plaines des Roches 9. Synnove Solar One L'Esperance 10.Solar Field Ltd, Mont Choisy 11. Synnove Solar One, Petite Retraite 12. Sotravic Landfill Gas to Energy , Mare Chicose

Water Resources Unit

1.6.5 The Water Resources Unit was established in May 1993. Its functions are to -

- study and formulate policy in relation to the control and use of water resources;
- keep a data base of water resources;
- prepare and follow up plans for the conservation, utilisation, control and development of water resources;
- co-ordinate and scrutinise the projects undertaken by any person relating to the conservation, utilisation and development of water resources and to assess the technical possibilities, benefits and socio-economic feasibility of the project;
- conduct and co-ordinate research and investigation on the economic use of water;
- promote, design and construct, in consultation with appropriate authorities, schemes and works for the purpose of conservation and development of water resources;
- ensure that water supply conforms with such standards as are laid by law;
- monitor the construction of major dam projects;
- ensure the regular maintenance of the dams; and
- implement integrated water resources management

Central Water Authority

Central Water Authority

1.6.6 The Central Water Authority (CWA), established by the Central Water Authority Act 1971, is responsible for the treatment and distribution of water for domestic, industrial and commercial purposes throughout Mauritius. As at June 2017, it was ensuring water supply to the population through six water supply zones, 4,276 kilometres of water pipes, 97 service reservoirs and 7 water treatment plants.

Wastewater Management Authority

Wastewater Management Authority

Wastewater Management Authority

1.6.7 The Wastewater Management Authority (WMA) was established in 2001, after the enactment of the Wastewater Management Authority Act 2000. The core services of the WMA are the collection and treatment of domestic, commercial and industrial wastewaters for disposal to an environmentally acceptable quality. As at July 2017, the WMA was operating 72 pumping stations and 10 treatment plants, including four main ones at St Martin, Grand-Baie, Baie-du-Tombeau, and Montagne Jacquot.

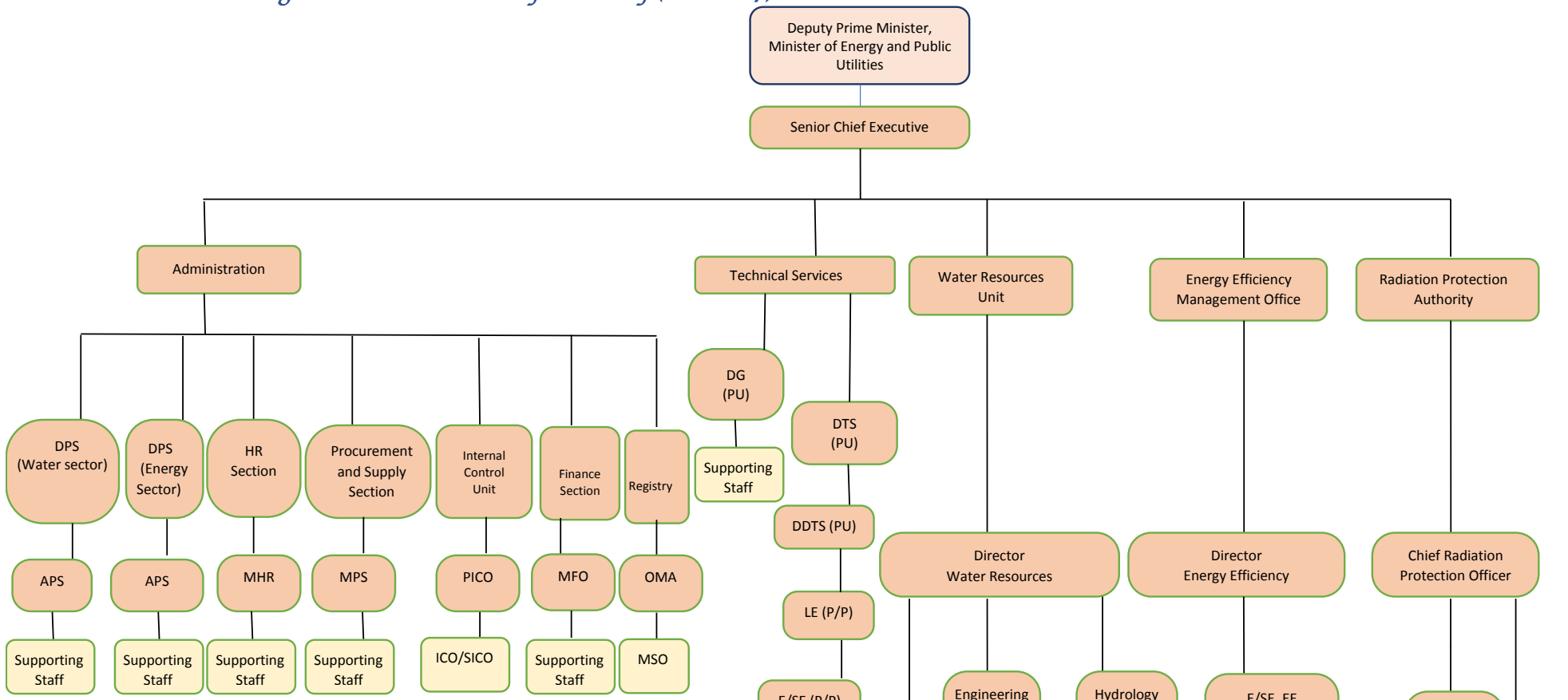
Radiation Protection Authority

1.6.8 The Radiation Protection Authority (RPA) is the national regulatory body, established under the Radiation Protection Act of 2003, to regulate and control all practices involving the use of ionising radiation.It has also the mission to protect people and the environment against the harmful effects of ionizing radiation through an effective regulatory system.

1.7 Main Legislation

ENERGY SECTOR	WATER ANDWASTEWATER SECTORS	RADIATION PROTECTION
Central Electricity Board Act 1963	Central Water Authority Act 1971	Radiation Protection Act 2003
Electricity Act 1939	Ground Water Act 1969	Radiation Protection(Personal Radiation Monitoring Service) Regulations 2012
Electricity Act 2005(not yet proclaimed)	Rivers and Canals Act 1863	Radiation Protection (Safe Transport of Radioactive Material) Regulations 2016
Electricity Regulations 1939	The Wastewater Management Authority Act 2000	Radiation Protection (Licensing and Registration) Regulations 2017
Energy Efficiency Act 2011	The Environment Protection (Drinking Standards) Regulations 1996	
Energy Efficiency (Labelling of Regulated Machinery) Regulations 2016		
Energy Efficiency (Registration of Auditors) Regulations 2016		
Energy Efficiency(Energy Consumer and Energy Audit) Regulations 2017		
Mauritius Renewable Energy Agency Act 2015		
Utility Regulatory Authority Act 2004		

1.8 *Organisation Structure of Ministry (2016-2017)*



DG (PU)	**Director General (Public Utilities)**
DPS	**Deputy permanent Secretary**
DTS (PU)	**Director Technical Services (Public Utilities)**
DDTS (PU)	**Deputy Director Technical Services (Public Utilities)**
APS	**Assistant Permanent Secretary**
MHR	**Manager Human Resources**
MFO	**Manager Financial Operations**
MPS	**Manager Procurement and Supply**
DD, WR	**Deputy Director, Water Resources**
LE (P/P)	**Lead Engineer (Project/Planning)**
E/SE (P/P)	**Engineer/Senior Engineer (Project/Planning)**
E/SE (E/E)	**Engineer/Senior Engineer, Energy Efficiency**
TO	**Technical Officer, Energy Efficiency**
SRPO	**Senior Radiation Protection Officer**
RPO	**Radiation Protection Officer**
PHO	**Principal Hydrology Section**
SHO	**Senior Hydrological Officer**
HO	**Hydrological Officer**
SHT	**Senior Hydrological Technician**
HT	**Hydrological Technician**
PICO	**Principal Internal Control Officer**
LE (P/M)	**Lead Engineer, (Planning/Maintenance)**
E/SE (P/M)	**Engineer, Senior Engineer (Planning/Maintenance)**
RPA	**Radiation Protection Assistant**

1.8.1 Staffing Structure –as at June 2017

Grade	Number
Administrative Cadre	5
Professional Cadre and Technical Grades	42
Pre-Registration Trainee Engineer	9
HR Cadre	3
Finance Cadre	4
Procurement and Supply Cadre	3
Internal Control Cadre	2
Officers from CISD	1
Safety and Health Officer –part time	1
Secretarial Class	15
General Services	33
Workmen's Class	32
Total	**187**

1.8.2 Vacancies filled

Grades	Public service commission	Ministry of Civil Service and Administrative Reforms
Administrative	1	-
Technical	3	-
Finance Cadre	2	
Secretarial Class	-	1 WPO
General Service	-	2
Total	**6**	**3**

1.8.3 Retirement

2 employees of General Services and 1 of Workmen's Class retired.

1.8.4 Training

18 officers of the Ministry, Water Resources Unit and Radiation protection Authroity attended training locally and 24 attended training overseas. 23 employees from CEB/CWA/WMA/MARENA attended training overseas.

1.8.5 Schemes of Service amended

The schemes of service **of** Hydrological Technician and Technical Design Officer were amended and became effective on 09 May 2017. The scheme of service of Senior Radiation Protection Officer was amended and became effective on 16 June 2017.

1.8.6 Others

- No. of staff who used passage benefits 26
- No. of requests for leave without pay 2

1.8.7 Staffing – Parastatal bodies as at 30 June 2017

	CWA	WMA	CEB	MARENA	URA
No of employees	1263	479	2126	6	6
Trainees	102	39	29		
Retired/Left	35	9	81		

JULY 2016-JUNE 2017

Shift to new accommodation

The Ministry and the Energy Efficiency Management Office moved to offices on part of first and ground floors and second floor in SICOM Tower,Wall Street, Ebene, in more functional working environment.

Appointment of Board of Utility Regulatory Authority

In June 2016, the Utility Regulatory Authority (Amendment) Bill was enacted to amend the Utility Regulatory Authority Act of 2004 in order to review the qualifications for the appointment of the Chairperson, and Commissioners, of the Board of the Utility Regulatory Authority. The Act retained the provision that the Chairperson and Commissioners shall be persons of high moral and professional integrity, having relevant qualifications, experience and expertise in either law, economics, business, finance, accountancy or engineering.The Chairperson and three Commissioners are appointed by the President, on advice given by the Prime Minister, after consultation with the Leader of Opposition.

On 14 September 2016, H.E the President appointed Professor Goolam Mohamedbhai, G.O.S.K., as Chairperson of the URA for a period of five years and Mr Philip Ah Chuen, Mr Rampiar Luchmun-Roy and Mr Eddy Astruc as Commissioners. Mr Astruc resigned for personal reasons and in November 2016, H.E the President appointed Mr Sadatmanund Narain as Commissioner.

Logo of URA

The URA launched a competition in October 2016 for the design of a corporate logo. Mr Kooshalnath Bhungy, winner of the competition, received a cash prize.

Road Map for URA

The National Renewable Energy Laboratory of USA provided assistance to develop a road map for the Utility Regulatory Authority.

Master Plan and Action Plan for Energy Efficiency

On 30 September 2016, Government approved an *Energy Efficiency / Demand Side Management Master Plan and Action Plan* 2016-2030, which has been prepared with the assistance of AFD. The main objectives of the Plan are to –

(a) attain an overall 10% reduction of energy consumption by 2030;
(b) generate sustainable energy savings by increasing energy efficiency investments in all sectors through the development of an enabling environment, and the provision of targeted financial incentives and technical assistance to project developers;
(c) develop and contribute to the growth of the market for energy efficiency services and technologies; and
(d) assist the private sector to acquire information, capacities, experience and implement more energy efficiency projects.

The document is available at ***eemo.govmu.org****.*

Mandatory labelling for domestic electric appliances

The Energy Efficiency (Labelling of Regulated Machinery) Regulations was introduced on 5 January 2017 (GN No 11 of 2017). These regulations provide that as from 1 July 2017, energy efficiency labels must be displayed on refrigerating appliances, electric ovens and dishwashers. As at June 2017, EEMO had received 270 applications for registration of appliances and had registered 62.

Energy audits

The Energy Efficiency *(*Energy Consumer and Energy Audit*)* Regulations 2017 (GN No 23 of 2017), which was introduced on 30 January 2017, became effective as from February 2017. It provides for mandatory energy audits in government buildings, the classification of energy consumers based on their average annual energy consumption for the two recent calendar years and large energy consumers to be those consuming above 15 tonnes of oil equivalent per year, which, in electrical terms, is equivalent to above 174,418 kWh per year. It also provides for the Director of the Energy Efficiency Management Office to direct large energy consumers to commission an energy audit and for all energy audits to comply with ISO 50002 – Energy Audits.

As at June 2017, the EEMO registered 46 energy auditors and 12 energy audit firms. It issued 21 notifications for energy audits to Prime Minister's Office, Government Printing Department, Police Department, Prisons Department, Ministry of Agro Industry and Food Security, Ministry of Health & Quality of Life, Supreme Court and the Ministry of Public Infrastructure and Land Transport. It carried out 11 energy audits at: -

(i) Medi-clinic PlaineVerte
(ii) Medi-clinic Goodlands
(iii) Medi-clinic Triolet
(iv) Bambous Police Station
(v) Phoenix State Secondary School
(vi) S. Virahsawmy State Secondary School
(vii) Curepipe Police Station
(viii) Dr Maurice Curé college
(ix) Quatre Bornes State Secondary School
(x) Mahatma Gandhi State Secondary School
(xi) Moka District Council

Survey on Energy use and Energy efficiency

In January 2017, the Ministry appointed StraConsult to conduct a survey on energy use and energy efficiency in hotels. The objective was to determine the type and quantity of fuel that hotels were using, details on different sources of electricity, the level of energy efficiency and energy consuming equipment.

PNEE
Programme National d'Efficacité Energétique

Programme National d'EfficaciteEnergetique (PNEE)

Under the joint public-private sector initiative of the Programme National d'Efficacite Energetique (PNEE), the EEMO collaborated with the Agence Francaise de Developpement and Business Mauritius. The long-term objective of PNEE is to facilitate the development of a market for quality energy efficiency and to carry out energy audits. During the period under review, 88 energy audits wereon-going in private enterprises in different sectors of activity, namely hotels, supermarkets and the manufacturing industry using cold, steam, compressed air, pumps, hot water.

Sensitisation on Energy Efficiency

The EEMO organised two national media campaigns on energy efficiency and labelling, 92 talks in primary schools, community centres and social welfare centres reaching out to 7,000 persons. It also organised one public competition for secondary schools and one for the public.

SUSTAINABLE DEVELOPMENT GOAL 7 - Ensure access to affordable, reliable, sustainable and modern energy for all

Electricity generation

In 2016, around 78% of the electricity was generated from non-renewable sources, mainly coal and fuel oil while the remaining 22% were from renewable sources, mostly bagasse. The main energy source for electricity generation was coal (41.6%), followed by diesel and fuel (36.5%) and renewable sources (21.8%). In 2016, coal (52.5%) was the major fuel used to produce electricity followed by fuel oil (25.4%) and bagasse (21.9%). Independent Power Producers produced around 60% of the total electricity. The peak power demand was 468 MW in 2016. (*Source: Statistics Mauritius*).

Redevelopment of Saint Louis Power Station

The implementation of the Redevelopment of St Louis Power station,comprising 4 units of 15 MW each, started in March 2016 and was in progress.The total cost of the project amounts to Rs 4.2 Billion.

Construction of Heavy Fuel Oil Storage tanks –les Grandes Salines

The construction of three heavy fuel oil storage tanks of 6,500 m^3 at Les Grandes Salines started in July 2016.

Combined Cycle Gas Turbine Plant

The CEB appointed a consultant EDF of France,which prepared the final version of the EIA report, risk assessment study as well as tender documents for the setting up of two gas turbines units in Port Louis, initially in Open Cycle Mode, to be fired with diesel fuel. The second phase of the project will consist of conversion of the Plant to a Combined Cycle Gas Turbine Power Plant and use Liquefied Natural Gas.

Feasibility study on LNG

In January 2017, the Ministry invited bids for the appointment of a Consultant to carry out a full feasibility study on LNG.

Renewable energy

Wind farm at Plaines des Roches

The wind farm at Plaines des Roches of 11 wind turbines with a capacity of 9.35 MW became operational in March 2016.

Solar EnergyProjects

Three new solar PV plants became operational in 2016/17. These solar farms exported 3.89 GWh to the grid. (*Source – CEB*).

Date	Project	Promoter	Capacity
December 2016	Mon Choisy solar farm	Solarfield Ltd	2 MW
January 2017	Petite Retraite solar farm	Synnove Solar(Mauritius) One Ltd	2 MW
January 2017	L'Esperance solar farm	Synnove Solar(Mauritius) One Ltd	2 MW
Total			**6 MW**

The CEB signed Electricity Supply Purchase agreements for 6 solar farm projects, which were expected to be commissioned by end 2018/ early 2019.

Project	IPP	Capacity (MW)
Beau Champ	Helios Beau Champ	9.00
Petite Retraite	Synnove	8.64
Petite Riviere	SPV Petite Riviere	4.88
Total		**22.52**
10- 15 MW		
Queen Victoria	Voltas Green Ltd	12.24
Solitude	Voltas Yellow Ltd	13.60
Henrietta	Akuo Energy (Mauritius) Ltd	15.00
Total		**40.84**

➢ *Medium-Scale Distributed Generation (MSDG)*

The CEB launched the MSDG Net-Metering Scheme (phase one) in May 2016. As at June 2017, it received 83 applications for the total aggregated capacity of 10 MW. By June 2017, 4 MSDG's were already operational at commercial malls and office buildings.

Solar panels at Super U Flacq

➢ *Small-Scale Distributed Generation (SSDG)*

1776 applications were received since 2015 for the second phase of the SSDG Net Metering Scheme. 493 installations had been commissioned as at June 2017.

➢ *Home Solar Project*

Government announced in the National Budget 2016/2017 that CEB would implement a project to install 10,000 solar PV kits for 10 MW on rooftop of houses of CEB's Customers in the Social Tariff 110A Category. All the eligible and qualified participating customers would benefit from net-billing discounts equivalent to 50 kWh per month of free electricity over a period of 20 years. The full investment cost of the project, estimated at around Rs 350 million,will be met by CEB with no financial and operational risks for the participating customers.

➢ *Green Energy Scheme for Cooperatives*

In March 2017, CEB launched a Green Energy Scheme for cooperatives, whereby federations and societies would receive a one-off grant of Rs 10,000 per kilowatt, up to a maximum of Rs 50,000 for the installation of a solar PV system. The project targets a total capacity of 100 kW in Mauritius and 25 MW in Rodrigues by end of 2018.

➢ *Green Climate Fund – 28 million USD grant to Mauritius*

In December 2016, the Green Climate Fund (GCF) approved a grant 28 million USD for the implementation of a project submitted by the Ministry and CEB, with the assistance of UNDP. The project was entitled "*Accelerating transformational shift to a low carbon economy*". The first phase (2017-2019) will strengthen the ability of the energy grid to use electricity generated by renewables and provide institutional support to MARENA and URA.

The second phase (2020-2024) will focus on the installation of rooftop PV installations on 300 houses in the island of Agalega. An amount of USD 10M will be used to fund rooftop solar PV for 25 MW in households, public buildings and buildings of NGO's.

➢ *Battery Energy Storage Systems*

CEB launched a tender in November 2016 for the design, installation, testing and commissioning of two BESS of 2MW each at Henrietta and Amaury Substations.

Report on renewable energy roadmap by Ryan Shea, Fulbright scholar

In April 2017, Mr Ryan Shea, Fulbright scholar from USA presented his research study entitled "Renewable Energy Roadmap for the Island Nation of Mauritius - Full Scale Assessment of Local Resource Potential, Levelised Cost of Electricity analysis, and Additional Capacity to Achieve their Renewable Energy Goals".

Transmission and Distribution

Strengthening of grid

The CEB invested an amount of Rs 723 M in 2017 to upgrade its transmission and distribution infrastructure throughout the country, particularly in Port Louis, Belle Vue to Sottise, Champagne to Wooton, FUEL to Anahita, St Louis to Chaumiere, La Chaumiere Henrietta amongst others and carry out undergrounding works.

Case Noyale 66 kV substation

The Case Noyale 66 kV substation was inaugurated by the Hon Ivan Collendavelloo, Deputy Prime Minister, Minister of Energy and Public Utilities on 15 December 2016. The cost of the project is Rs 520 M. It will ensure reliable and good quality electricity supply andreduce line losses and faults.

Rehabilitation of street lighting along motorway

The CEB completed the rehabilitation of the public lighting network, with funding from Government on M1 from Plaisance airport to Place d'Armes, M2 from Place d'Armes to Grand Baie, and M3 from Ebène via Verdun to Khoyratty.

Fibernet project

CEB (Fibernet) Co Ltd initiated the Fibernet project, which aims at using theoptic cable network of CEB to provide high-speed data services to Internet Service Providers and Mobile Network Operators. It awarded a contract on 15 February 2017 for Backbone network supply and installation.

Utility Customer Centre

On 03 March 2017, the CEB (Facilities) Co Ltd was incorporated. It set up a Call Centre for CEB & CWA customers, with the trading name Utility Customer Centre and provides 24/7 service for the hotlines of 130 and 170.

Social measures

Support to low income groups

About 59,000 customers benefitted from the social tariff 110 A, introduced with effect from 1 December 2015 and which is lower than the normal tariff.CEB assisted 74 customers for extension of their electricity network.

Water sector

SUSTAINABLE DEVELOPMENT GOAL 6 - Ensure availability and sustainable management of water and sanitation for all

The main source of water supply is ground water (54%) – abstracted through 112 boreholes. The balance (46%) is derived from surface sources – impounding reservoirs and river in takes.There are five main aquifers in Mauritius,comprising 429 boreholes.

The main reservoirs are:

Mare aux Vacoas, located in Plaines Wilhems, is the largest reservoir in Mauritius. It has a capacity of 25.89 million cubic metres and provides water to the Upper Plaines Wilhems and to Moka.

La Nicolière Reservoir, constructed in the year 1929, supplies water for domestic, industrial and irrigation purposes to the northern districts and part of Port Louis. The reservoir has a capacity of 5.26 Mm3.

Piton du Milieu

This reservoir was constructed in 1952 in Moka district. It has a capacity of 2.99 Mm3. It provides water to the Eastern region.

La Ferme Reservoir

La Ferme Reservoir, located near Bambous village, was constructed in 1914. The capacity is 11.52 Mm3. It is used only for irrigation.

Midlands dam

The dam became operational in December 2002. It has a capacity of 25.5 Mm3. It is used for potable water supply and irrigation and supplements water at Nicoliere reservoir.

Bagatelle dam

The Bagatelle Dam, located in Plaine Wilhems, has a storage capacity of 14 million cubic metres. The construction started in 2012 and was completed in June 2017.

Mare Longue Reservoir

Mare Longue Reservoir, constructed in the year 1948 in Plaine Wilhems, has a storage capacity of 6.28 Mm^3.

Highlights Water Resources 2016(*Source Statistics Mauritius*)

The main highlights in the water sector in 2016 were as follows:

	2015	2016	%
Mean amount of rainfall	2,377 millimeters	1.896 millimeters	20.2
Water treated by CWA	245 Mm^3	247 Mm^3	0.8
Volume of water sold	113 Mm^3	119 Mm^3	5.3
Revenue collectible from sales of water	Rs 1,383 M	1,455 M	5.2
Per capita consumption per day (domestic) liters	159	166	

- Mean percentage water level for all reservoirs (excluding Midlands Dam) - 58% to 96%
- Total volume of water sold in 2016 - 119Mm^3,(84.4% constituted of potable water and 15.6% of non-treated water).
- Volume of water sold under domestic tariff - 76 Mm^3 of water (64% of the total volume of water sold).

Bagatelle dam – Dam Break Analysis

In October 2016, the Ministry awarded a contract to Artelia Eau et Environnement for a dam break analysis, which consists of an exhaustive examination of all possible dam failure modes, inundation maps and submitting an emergency preparedness plan.

Completion of Bagatelle dam

Impounding of the dam started on 22 December 2016. The Taking Over Certificate was issued by the Consultant on 30 June 2017. Water from this dam is being channelled through River Terre Rouge to Pailles Water Treatment plant to supply Port Louis.

In September 2016, Government received an amount of Euros 2 million from Tractebel Engineering S.A following the settlement of a dispute, arising from the termination of the contract of the Consultant in January 2014.

Riviere des Anguilles dam

On 6 February 2017, the Ministry invited proposals through Open International Bidding for Consultancy Engineering Services for the Design Review and Construction Supervision of the Rivière des Anguilles Dam. The dam will be of capacity of about 14 Mm3. It will meet present and future water demand in the south of Mauritius. The water production would increase from 78,000 m3 daily to 128,000 m3 daily.

Feasibility study of Increasing capacity of Nicoliere dam

In May 2017, the Ministry awarded a contract to Consultancy firm, SMEC International PTY Ltd/Vyaass Consulting Engineer for the sum of Rs 4,384,263 and USD 385,223 to carry out a feasibility on increasing the capacity of La Nicoliere dam.

Drilling of boreholes

Two new boreholes were drilled and put into use at Beaux Songes and Queen Victoria, increasing water supply in Flic en Flac and the eastern regions.

➢ *Integrated Water Resources Management Project (IWRM)*

Mauritius participated in a project funded by the Global Environment Facility (GEF) which was being implemented in six islands, two of which are located in the Atlantic Ocean (Cape Verde and Sao Tome & Principe) and four in the Indian Ocean (Comoros, Maldives, Mauritius and Seychelles). The IWRM AIO SIDS project addressed issues related to the management of water resources, both freshwater and coastal marine areas in an integrated manner. It supported the implementation of demonstration activities on IWRM and Water Use Efficiency. The Ministry implemented the project in the northern aquifer, which consists of about 30 domestic pumping stations, 56 industrial boreholes and 62 agricultural boreholes. The outcome of the project is as follows –

(i) Under the guidance of a water quality expert, the WRU carried out a demonstration project in the northern aquifer, including an assessment of the freshwater/seawater interface and groundwater quality, and the establishment of a Geographical Information System (GIS). Five boreholes were drilled and each was fitted with multi-level piezometers, instruments that allow for the sampling of groundwater at different depths.

(ii) A water quality-monitoring programme was put in place to carry out effect regular sampling and laboratory analysis. In the long term, such testing is expected to establish a water quality baseline and to assess the vulnerability of groundwater resources against pollution and over abstraction.

(iii) An Indicator Framework was developed with the support of the University of Mauritius and the collaboration of the Ministry of Environment, the Meteorological Services, Ministry of Health and Quality of Life, CWA, WRU, Wastewater Management Authority, Central Electricity Board and Irrigation Authority. It was submitted in May 2017.

(iv) Mr. D. Malzbender , Consultant was appointed in April 2017 to prepare a National IWRM Plan.

➧ *Regional photography competition*

In the context of the IWRM project, UNOPS organised a regional photography competition on the theme 'Water for Islands' from 28 February to 20 March, 2017 in six islands - Mauritius, Comoros, Maldives, Seychelles, Cap Verde and Sao Tome. Among 156 entries Mauritius and Sao Tome won the first prize. The prize winner, Mr Mahesh Kumar Augnoo attended the World Water Week in Sweden.

Prize winning photo

World Water Day 2017

The World Water Day 2017 was on the theme of ***Why Wastewater.*** The Ministry organised a workshop to sensitise planters and livestock breeders on water conservation and use of recycled water. The CWA organized an exhibition on the 21, 22, 32 and 24 March 2017 at La Marie Water Treatment Plant. University of Mauritius students planted 200 trees at Arnaud Dam in March 2017.

UN poster for World Water day

Paintings by primary school students

Social Measures

6 m³ free water scheme

61,000 consumers benefitted from exemption of water charges as their consumption did not exceed 6 cubic meter.

Pipe Replacement works

During period 2016/17, the Central Water Authority completed 13 projects for the replacement of about 116 kms of pipes in the following regions:

Riviere des Anguilles – Tyack	Solferino
Midlands dam to Piton du Milieu	Henrietta
Ferney	John Kennedy, Vacoas
Melrose Reservoir to Montagne Blanche	Curepipe ,Lislet Geoffroy
Alma Reservoir to Alma Hill	Riviere du Rempart
Poste de Flacq to Poste La Fayette	SSRN Hospital
Cap Malheureux to St Francois/Goodlands	

- CWA awarded six contracts in 2016 for the replacement of 43 kms of pipes at the cost of Rs 91 million and since January 2017, it awarded16 contracts for the replacement of 161 kms of pipes at the cost of Rs 1.6 billion.

- The construction of a new service reservoir of 2000 m^3 at Mont Blanc costing Rs 23 M was completed in December 2016 and became operational in January 2017.

- The construction of the Bagatelle Water Treatment plant started in February 2017. The project value is Rs 890,603,858.26 + VAT.

- 3 duplicate boreholes were drilled at La Louise, Petite Riviere and Petite Juile. A new borehole was put into use at Plaine Magnien.

Water Sector Reform

The Government programme 2015-2019 underlined Government's commitment to "*addressing, on a priority basis, the long standing problem of water supply in the country*". It stated "*Water resources will be mobilised and infrastructure including pipes renewed or replaced to reduce water loss and ensure year round water supply*."

On 18 February 2016, a Reimbursable Advisory Services Agreement between the Government of Mauritius and the International Bank for Reconstruction and Development was signed. This Agreement provided for the World Bank to provide strategic advice and support to Government for the design and implementation of a Private and Public Partnership for the Central Water Authority and for potable water sector reform.

The Bank submitted its final report on 7 October 2016. In February 2017, Government approved the recommendations of the Bank,subject to the World Bank mobilising financing of the services of the transaction adviser and the advisory services of the Bank.

Wastewater sector

About 27% of the population is connected to the public sewer network. The WMA operates the following treatment plants

- **St Martin Wastewater Treatment Plant,** constructed in 2004, has a hydraulic design capacity of 69,000 m3/day and treats wastewater up to tertiary level.
- **Mt. Jacquot Wastewater Treatment Plant,** constructed in 2007, has a hydraulic design capacity of 48,000 m3/day, and provides an advanced primary treatment.
- **Grand Baie Wastewater Treatment Plant**, built in 2003, has a hydraulic design capacity of5,500m3/day.
- **Baie du Tombeau Wastewater Treatment Plant,** built in 2000, has a hydraulic design capacity of 48,000 m3/day and provides preliminary treatment.

Contracts awarded

The WMA awarded contracts for eight projects for a total amount of about Rs 568 Million during the period June 2016 to July 2017 as follows:

PROJECT	DATE OF AWARD	CONNECTIONS
Design and Construction of Sewer Reticulation and House Connections at Cipayé Brulé, Vallée des Pretres	September 2016	146
Kensington Sewerage Project	February 2017	140
Rehabilitation/Provision of Sewerage Infrastructure at Residence Palmerstone - CHA Phase IV	March 2017	80
Rehabilitation/Provision of Sewerage Infrastructure at Residence La Cure, Port Louis - CHA Phase IV	March 2017	60
Rehabilitation/Provision of Sewerage Infrastructure at Cité Paul et Virgine - CHA Phase IV	March 2017	127
Sewerage Project at ValléeDesPretres& Tranquebar	June 2017	100
Design and Construction of Sewer Reticulation and House Connections at Tranquebar	June 2017	100
Highlands Sewerage Project – Phase 1	July 2017	200

Projects completed

Project	House connections
Alfred Gelle wastewater project, PlaineVerte	26
Marcel Cabon Sewerage project, Albion	11
Plaines Wilhems Lot 1 A Project - Stanley, Palma, Hugnin, Bassin, Trèfles, Seeneevassen and Victoria	6,800

Framework Agreement – House connections

In August 2016, the WMA Board awarded a Framework Agreement for house connections, which has shortened the timeframe for house connections from 9 months to one month.

Radiation Protection

Monitoring of radiation workers

In 2016, the RPA monitored 800 radiation workers for occupational exposure to ionizing radiation. This number increased to 928 in 2017. RPA provided personal dosimeters to 128 additional radiation workers for the monitoring of their occupational exposureto ionising radiation. It RPA provided 57 radiation workers with wrist dosimeters.

Introduction of new e-services

The RPA introduced four new e-services for applications for Registration of Radiation Sources; Application for subscription to the Personal Radiation Monitoring Service; Application for amendment of the Personal Radiation Monitoring Service and Feedback and Suggestion Form.

Regulations

The Radiation Protection (Safe Transport of Radioactive Material) Regulations was introduced in 2016 to comply with the Regulations for the Safe Transport of Radioactive Material No. SSR-6 (2012 Edition),of the International Atomic Energy Agency.

International and Regional Cooperation

Framework Agreement - International Solar Alliance

At the COP 21 meeting held in Paris in November 2015, the Prime Minister of the Republic of India and the President of France jointly launched the International Solar Alliance, which is open to countries falling completely or partly between the Tropic of Cancer and the Tropic of Capricorn. The objective of the Alliance is to encourage innovative and affordable applications of solar technologies.

In May 2017, Hon Ivan Collendavelloo, Deputy Prime Minister, Minister of Energy and Public Utilities signed the Framework Agreement on the establishment of the International Solar Alliance. The Instrument of Ratification was deposited during the State visit of the Prime Minister to India from 26 to 28 May 2017 in the presence of Hon N. Modi, Prime Minister of India.

Convention de Partenariat Tripartite Under the Fonds d'Expertise Technique et d'Echanges d'Expériences

In March 2017, the Ministry signed a Convention de Partenariat Tripartite under the Fonds d'Expertise Technique et d'Echanges d'Expériences (FEXTE) with AFD and l'Agence de l'Environnement et de la Maitrise de l'Energie, Reunion (ADEME) for a grant of 100,000 Euros to support renewable energy and energy efficiency projects. The signing ceremony took place at Saint Denis, Reunion.

Signing ceremony at Prefecture of Reunion on 23 March 2017

International Renewable Energy Agency (IRENA)

The IRENA Assembly elected Mauritius as one of the Vice Presidents for its Sixth Assembly held in January 2016. Mauritius was represented by Hon P. Roopun, who chaired part of the Assembly meeting. Mauritius acted as vice president up to January 2017.

Status of implementation of budget measures

July 2016-June 2017

Budget measure	Title of project	Status as at 30 June 2017
127	Set up Renewable Energy company for production of electricity from solar PV systems up to 15 MW.	CEB (Green Energy) co ltd set up on 11 October 2016
128	Feasibility study on the production of electricity through solar panels placed on roof tops of houses to involve some 10,000 households, over the next five years, who are benefitting from the social electricity tariff.	CEB completed selection of beneficiaries and initiated procurement for selection of supplier
129	CEB will invest Rs 400 million to increase the grid absorption capacity of intermittent energy from 148 to 160 MW by 2018.	CEB awarded contract for installation of battery of 2 MW capacity each at Henrietta and Amaury substations.
130	CEB proposes to procure battery storage systems so as to become resilient to the intermittent nature of renewable energy	
132	CEB will invest Rs 200 million for the upgrading of the Sans Souci plant capacity and it has identified twelve sites on private land with potential hydro power generation.	CEB appointed a consultant to carry out feasibility study
133	A major waste-to-energy project is expected to add up to 30 MW of electricity on the grid by 2019	CEB launched bids launched in April 2016. No bidswere responsive. New bidswillbe launched
134	Government will facilitate production of energy from bio-mass, including cane tops and trash and at the same time ensure that small planters will get their fair share of the revenue.	Negotiations initiated with Alteo with legal advisory support from AFDB
135	The Electricity Act and the CEB Act will be amended to accelerate the permit approval process of renewable energy investment projects.	Amendments made to CEB Act through the Finance (Miscellaneous) Bill.
146	An investment of Rs 200 million by the CEB to provide high speed broadband to Internet Service Providers through its island-wide fiber optic cable network.	CEB (FiberNet) company Ltd set up. In October 2016, contract for business model evaluation of OPGW network awarded. On 15 Feb 2017 contract awarded for Backbone network supply and installation.
185	Rs 425 million will be invested by the CEB in a sub-station in the airport vicinity to cater for Cargo and Freeport power requirements.	CEB appointed a consultant to design the substation.
218	Rs 30 million for repairing lighting along motorways	Project Completed

Status of implementation of key actions

Key Action	Key Performance Indicator	Target 2016/17	Achievements as at 30 June 2017
Implementation of Electricity Social tariff	Number of families benefiting from electricity social tariff	70,000	59,000
Generation of Electricity from Wind and solar	Additional electricity generated from wind and solar sources (MW)	48 MW	43 MW
Monitoring of additional radiation workers	Number of radiation workers monitored	120	160
Laying of water pipes	Length of water pipes laid (km)	180	27.1
Connection of additional premises	Number of additional premises connected to the sewerage network	2000	1878
Energy audit of government owned buildings	Number of government-owned buildings subject to energy audit	20	5

➢ *Risk Management*

➢ Internal Control

An Internal control unit was set up at the Ministry. It carried out five audit exercises and made 40 recommendations. By June 2017, the Ministry had implemented 90% of the recommendations.

➢ Audit Committee

The Audit Committee of the Ministry met regularly to follow-up on issues raised in the Director of Audit's report and the Internal Control Reports and issued quarterly reports and a final report at the end of the calendar year to the Office of Public Sector Governance (OPSG).

➢ Reform Committee

The Reform Committee looked into the implementation of the Performance Management System, the HRMIS, on-line services and sectoral reforms. The Ministry updated its Citizen Charter.

➢ Occupational Safety and Health

25 safety audits were conducted in all workplaces of the Ministry, 5 risk assessments were carried out and recommendations have been implemented. Fire drills were carried out at the head office, WRU and RPA buildings.

PART III - FINANCIAL PERFORMANCE

Financial Highlights

Overall Expenditure (BY VOTE)

The Budget 2016-2017 provided an amount of Rs 2,947,000,000 to the Ministry. The expenditure amounted to Rs 1,464,599,000, excluding projects financed by the Build Mauritius Fund (BMF). A summary of expenditure incurred under the BMF is as follows:

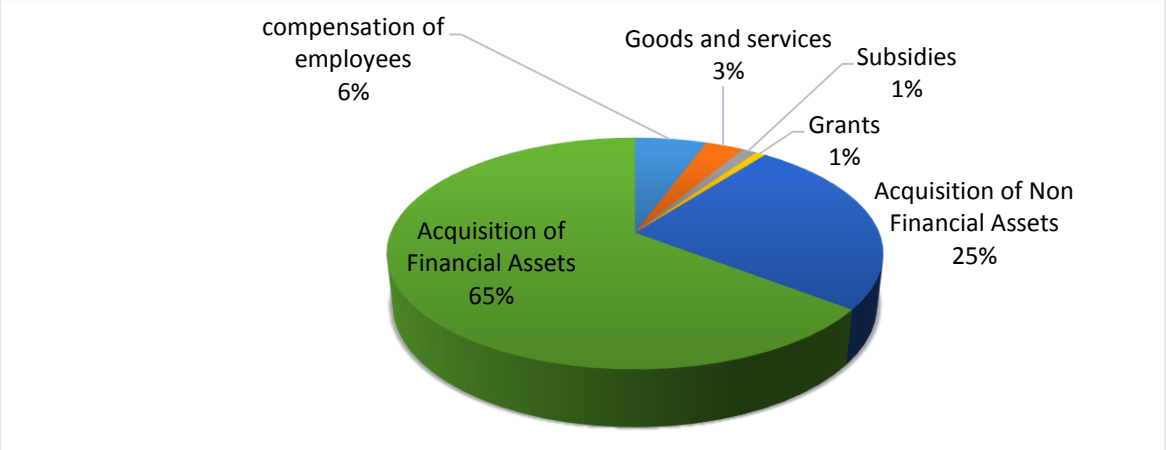
Projects Financed under the BMF

Description	2016-2017 Actual Rs(M)
Bagatelle Dam Project	363.167
Water Tank Scheme	24.860
Pipe Replacement	127.708
TOTAL	515.735

A breakdown of expenditure by economic categories under the Ministry's Vote 5-1 is as follows:-

Vote 5-1 Energy and Public Utilities

Expenditure by Economic Categories (Rs M)

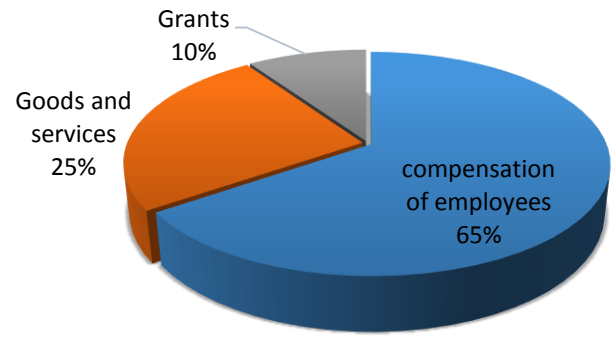
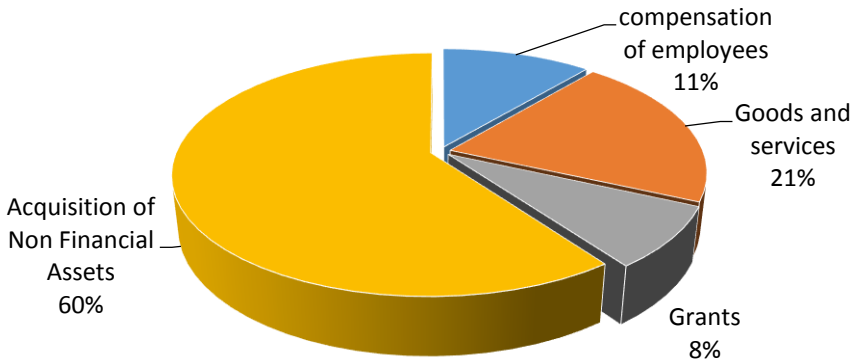
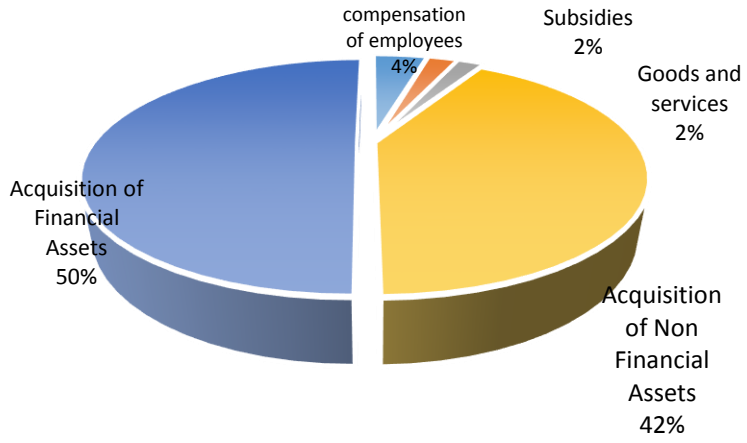


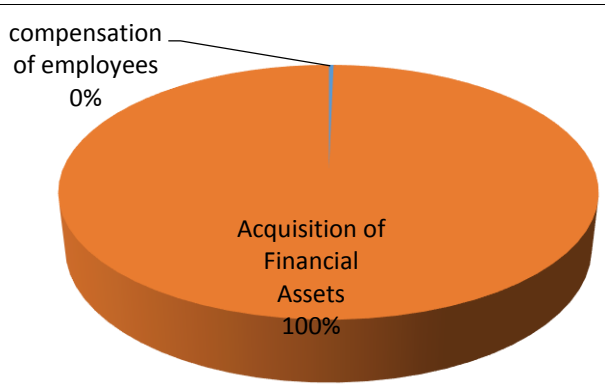
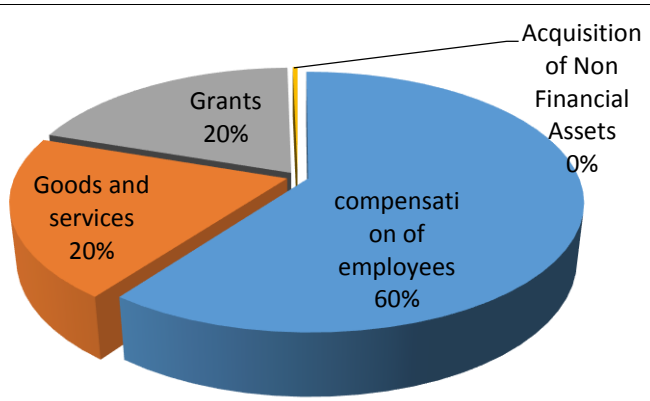
(i) *Compensation of employees* consists of basic salary and compensation, allowances extra assistance, cash in lieu of leave, travelling and transport overtime, staff welfare and social contributions.
(ii) *Goods and Services* include of cost of utilities, fuel and oil, rental, maintenance of equipment, publications and stationery, studies and surveys and other goods and services.
(iii) *Subsidies*are government grants provided to the Wastewater Management Authority and Central Water Authority.
(iv) *Grants* are funds provided to finance the operations of the Utility Regulatory, Mauritius Renewable Energy Agency and contribution to the International Organisations such as the International Renewable Energy Agency and the International Atomic Energy Agency.
(v) *Acquisition of Non-Financial Assets* represents Capital Expenditure.
(vi) *Acquisition of Financial Assets* represents loans granted to Central Water Authority and Wastewater Management Authority

Expenditure by Sub Head

TheMinistry of Energy and Public Utilities had the following sub heads under its main vote:

(i)	Sub Head 05-101	General
(ii)	Sub Head 05 -102	Energy Services
(iii)	Sub Head 05-103	Water services
(iv)	Sub Head 05 -104	Wastewater Services
(v)	Sub Head 05-105	Radiation Protection services

05-101 General	
05-102- Energy Services	
05-103 – Water Services	

05-104 - Wastewater Services	
05-105- Radiation Protection	

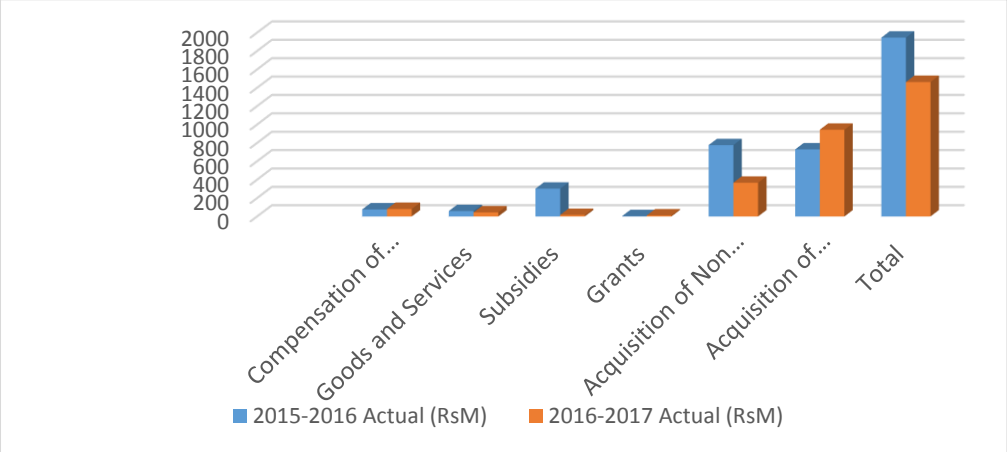
Revenue

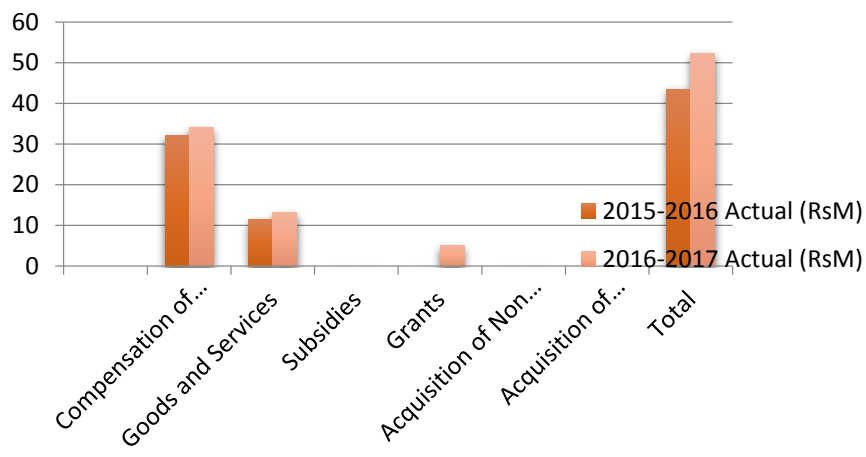
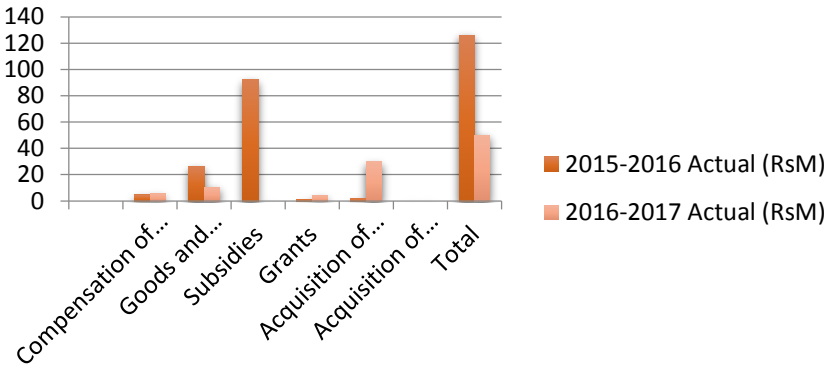
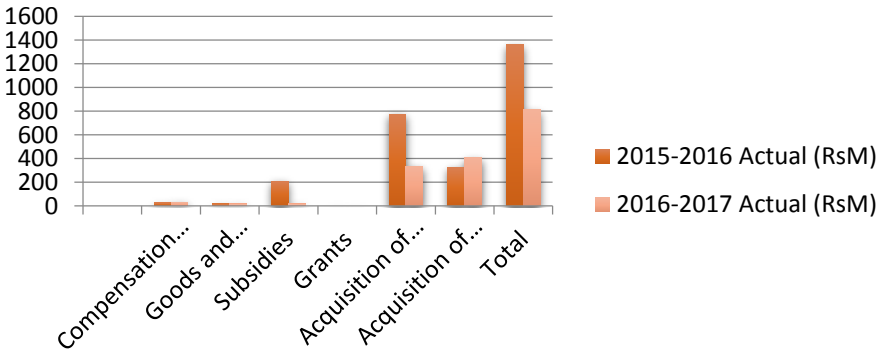
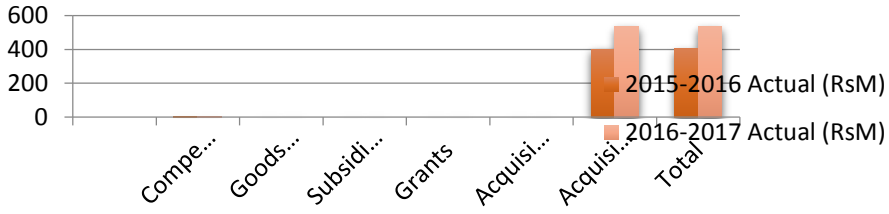
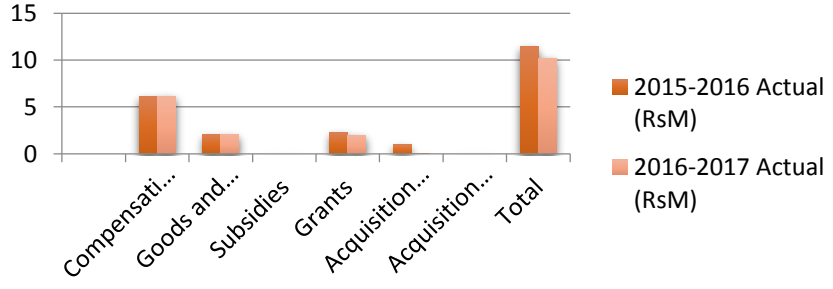
The Radiation Protection Services collects revenue under the heading “Miscellaneous sale of Goods and Services” in respect of Personal Radiation Monitoring Services, licensing, import permit and registration of radiation facility. The total revenue collected during the financial year 2016-2017 amounted to Rs 0.825 M.

Analysis of Major Changes

Statements of Expenditure & Analysis of major changes

Vote 5-1 Comparison of Actuals



SUB HEAD 5-101	
SUB HEAD 5-102	
SUB HEAD 5-103	
SUBHEAD 5-104	
SUB HEAD 5-105	

- Subsidies were not provided to CEB during the Financial year 2016-2017.Subsidies to CWA for the Pipe Replacement Programme were also provided from the Build Mauritius Fund. An amount of Rs127.7M wasspent in that respect.

- There was an increase of 68.77 % in respect of grants as highlighted below:

Sub-Head	Description	Actual Expenditure 2015-2016 Rs(M)	Actual Expenditure 2016-2017 Rs(M)
5-101-General	Utility Regulatory Authority	-	5.00
05-102(Energy Services)	(i)Contribution to International organization (ii)Mauritius Renewable Energy Agency	0.11 1.10	0.10 4.00
05-105-Radiation Protection Services	Contribution to International organization	2.25	1.98
TOTAL		3.46	11.08

- There was an increase of 22.64% in respect of loans:

Sub-Head	Description	Actual Expenditure 2015-2016 Rs(M)	Actual Expenditure 2016-2017 Rs(M)
05-103(Water Services)	Loans to CWA	327.78	408.42
05-104(Wastewater Services)	Loans to Wastewater Management Authority	401.91	536.57
729.69	**944.99**		

- **Statement of Revenue**

	2015-2016 Actual (Rs M**)**	2016-2017 Estimates (RsM)	2015-2016 Actual (Rs M)
Sales of Goods and Services	1.132	1.000	0.825

- **Statement of Expenditure for Overall Vote 5-1**

Vote 5-1 Energy and Public Utilities (Summary)	**2015-2016 Actual (RsM)**	**2015-2016 Estimates (RsM)**	**2016-2017 Actual (RsM)**
Compensation of Employees	76.177	95.861	81.324
Goods and Services	58.731	116.839	43.678
Subsidies	301.943	16.600	16.600
Grants	3.461	17.700	11.080
Acquisition of Non-Financial Assets	775.775	390.000	366.929

- **Statement of Expenditure by Sub- Head**

05-101 General	**2015-2016 Actual (RsM)**	**2016-2017 Estimates (RsM)**	**2016-2017 Actual (RsM)**		**Sub- Head of Expenditure 05-102- Energy Services**	**2015-2016 Actual (RsM)**	**2016-2017 Estimates (RsM)**	**2016-2017 Actual (RsM)**
Compensation of Employees	32.143	41.705	34.100		Compensation of Employees	4.489	6.351	5.573
Goods and Services	11.306	13.945	13.037		Goods and Services	26.049	56.379	10.278
Subsidies	-	-	-		Subsidies	92.419	-	-
Grants	-	5.000	5.000		Grants	1.209	10.100	4.096
Acquisition of Non Financial Assets					Acquisition of Non Financial Assets	1.824	30.000	30.000
Acquisition of Financial Assets					Acquisition of Financial Assets	-	-	-
TOTAL	**43.449**	**60.650**	**52.137**		**TOTAL**	**125.990**	**102.830**	**49.947**

05-103- Water Services	**2015-2016 Actual (RsM)**	**2016-2017 Estimates (RsM)**	**2016-2017 Actual (RsM)**		**05-104- Wastewater Services**	**2015-2016 Actual (RsM)**	**2016-2017 Estimates (RsM)**	**2016-2017 Actual (RsM)**
Compensation of Employees	31.855	38.910	33.731		Compensation of Employees	1.573	1.920	1.776
Goods and Services	19.308	41.090	18.314		Goods and Services	-	3.000	-
Subsidies	209.524	16.600	16.600		Subsidies	-	-	-
Grants	-	-	-		Grants	-	-	-
Acquisition of Non Financial Assets	772.954	339.00	336.895		Acquisition of Non Financial Assets	-	-	-
Acquisition of Financial Assets	327.782	1,255.00	408.416		Acquisition of Financial Assets	401.909	1,055.000	536.572
TOTAL	**1,361.423**	**1,690.600**	**813.956**		**TOTAL**	**403.482**	**1,059.920**	**538.348**

Sub- Head of Expenditure 05-105 Radiation Protection Services	**2015-2016 Actual (RsM)**	**2016-2017 Estimates (RsM)**	**2016-2017 Actual (RsM)**
Compensation of Employees	6.117	6.975	6.144
Goods and Services	2.068	2.425	2.049
Subsidies	-	-	-
Grants	2.252	2.600	1.984
Acquisition of Non Financial Assets	0.996	21.000	0.034
Acquisition of Financial Assets	-	-	-
TOTAL	**11.433**	**33.000**	**10.211**

Trends and Challenges

Major challenges

- Ensuring long term energy security by diversifying sources of electricity generation
- Shifting towards cleaner energy
- Achieving 35% of renewable energy by 2025
- Impact of climate change,namely rising temperature, decrease in rainfall of around 8% annually and prolonged dry periods on water sector
- Addressing water stress
- Preventing adverse impact of economic and agricultural activity on aquifers and rivers
- Reducing water losses in the distribution system
- Increasing water resources and improving the supply and distribution infrastructure to ensure regular water supply to the population
- Extending wastewater to environmentally vulnerable regions
- Meeting obligations under the international legal instruments in the field of radiation safety, nuclear security and safeguards.

Strategic Direction

- Increasing electricity generation capacity to meet medium and long term demand
- Increase the contribution of renewable energy technologies and encouraging the participation of small and medium producers in generation of electricity through use of renewable technologies
- Develop standards for renewable energy.
- Encourage battery storage energy systems and strengthen grid capacity to integrate a higher share of renewable energy.
- Implement energy efficiency measures in all sectors and extend mandatory labelling to other electrical appliances
- Establish a licensing system to license power producers
- Develop a legal framework for management, conservation and control of water resources.
- Continue implementing a water supply infrastructure development programme with replacement of old pipes, construction and rehabilitation of dams, replacement of consumer meters, construction of new service reservoirs, and upgrading of treatment plants.
- Implement an integrated water resources management system
- Monitor the quality of water with effective databases and indicators and monitoring of effluent discharge.
- Extend sewerage network to densely populated areasand upgrade major wastewater treatment plants.
- Ensure the safety and security of radiation sources for the protection of the public and the environment against the harmful effects of ionizing radiation.
- Introduce the Radiation Safety and Nuclear Security legislation to ensure compliance with the international instruments of IAEA.