



MARANATHA
CHRISTIAN
UNIVERSITY
dare to make a difference

SUSTAINABILITY PLAN 2020 - 2025







MESSAGE FROM THE BOARD CHAIR

ACCORDING TO THE UNITED NATIONS, CLIMATE CHANGE IS THE DEFINING ISSUE OF OUR TIME AND WE ARE AT A DEFINING MOMENT.

Climate change impacts ranging from shifting weather patterns that threaten food security, risk of catastrophic flooding, erratic and unpredictable rainfall patterns to heat waves, the impacts of climate change are global in scope and unprecedented in scale. Without drastic action today, adapting to these impacts in the future will be more difficult and costly.

At the 21st Conference of the Parties in Paris in 2015, Parties to the United Nations Framework Convention on Climate Change (UNFCCC) reached a landmark agreement, the Paris Agreement, to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future. Zimbabwe is one among various countries to ratify the 'Paris climate change agreement', which advocates for ambitious climate action targets including the generation of minimum 40% of electricity from non-fossil fuel sources.

Universities are affected by climate change just

like every other institution in our society. We face new threats to campus infrastructure, and to the safety of students, faculty and staff. While universities grapple with these problems, we have the opportunity and potential to be part of the solution by leading research on and implementing key strategies in sustainability and build community climate resilience. Universities and colleges act as small, self-contained cities, often serving energy needs equivalent to a typical small – medium community size. Going green saves green, too. Collectively, the Zimbabwe's higher education institutions spend billions of dollars each year on around-the-clock electricity that powers everything from dorm room mini fridges to high-tech laboratories. High operating costs tend to be passed along to students and their families in the form of rising tuition fees. We at MCU are looking for solutions to operate on green and clean energy on our premises.

CONTENTS

1.0	Our Vision and Mission	1
2.0	Our Sustainability Plan	2
3.0	Statement of our Commitment to sustainability	3
4.0	Linking sustainability to our University's core areas	4
4.1	Research	4
4.2	Education and Learning	4
4.3	University Operations	5
4.4	University Governance	5
4.5	Sustainable Green Campus	5
4.6	Public Engagement	6
5.0	Current sustainability plans on site	7
6.0	Our Sustainability Goals and Targets	13
6.1	Climate, Energy and Emissions	13
6.2	Water and Waste water	13
6.3	Waste and Recycling	13
6.4	Travel and Transport	14
6.5	Land and Biodiversity	15
6.6	Sustainable buildings	15
6.7	Sustainable procurement	15
7.0	Annexure	16
	Table 1: Annual sustainability metrics at MCU	16
	Table 2: MCU emissions by source, 2020	16
	Table 3: Annual energy usage and greenhouse gas emissions at mcu, 2020 - 2025	17
	Table 4: Annual water usage at mcu, 2020 - 2025	17
	Table 5: Annual solid waste at mcu, 2020-2025	17
	Table 6: Annual hazardous waste at mcu, 2020 - 2025	18
	Table 7: Composition of MCU campus fleet and fuel consumption, 2020 – 2025	18



1.0

OUR VISION AND MISSION

Our vision is to be a world class Christian University renowned for its advanced research, teaching and entrepreneurial education for personal development and socioeconomic transformation.

Our mission is to promote world-class academia in research, teaching and learning in support of personal growth, industrial development and technological advancement whilst positively impacting local communities, the nation and the region at large through the provision of problem-solving skills, knowledge and value-adding attitudes.

Maranatha Christian University (MCU) will not only work to make its students entrepreneurial and smarter, but also to make our campus smarter, greener and more energy efficient.

2.0 OUR SUSTAINABILITY PLAN



The Maranatha Christian University's Sustainability plan is a guiding document for building and operating a green, healthy, and a more sustainable campus community. With this plan, we endeavor to tackle global and local challenges in ethics, responsibility and sustainability. This plan outlines our goals and priorities in the areas of campus operations, energy and emissions, water, waste, research, learning, governance and community engagement.

OUR STRATEGIES TOWARDS SUSTAINABILITY INCLUDE:

- Make environmental sustainability a major guiding principle in our planning and decision-making;
- Create and cultivate a campus culture of sustainability, ethics and responsibility;
- Excellence in sustainability science, research, academic, and operations as we walk the talk;
- Endeavor to develop a dense, green, and compact campus in a natural resource rich location;
- Setting environmental footprint reduction targets and bench marks on the path to climate neutrality by 2025; and
- On campus energy generation and generating surplus to feed into the national grid.

3.0 MARANATHA CHRISTIAN UNIVERSITY COMMITMENT TO SUSTAINABILITY

COMMITMENTS

As Maranatha Christian University founders, faculty, students and staff, we are committed to thinking globally and taking local action to take a leadership role as stewards of our surrounding environment. We utilize our theoretical and practical educational and research activities to promote awareness of environmental and sustainability issues. We endeavor to run all our campuses, facilities and university sites completely on renewable energy within the first 5 years of operation.

Protecting our campus environment;



Increasing the awareness of the need for sustainability through instruction and leading by example



Utilizing cutting edge sustainable technology and innovative research to advance the University's goals and sustainability



Keeping our campus greenhouse gas emissions as low as possible and endeavor to be carbon neutral by 2025



Maintain and conserve our natural environment around the campus and sustainable use of resources in all our operations



Establish and maintain collaborations and partnerships with diverse stakeholders, other universities, and the campus community to advance our sustainability goals



Purchasing environmentally friendly products through our sustainable procurement policy, and minimizing the use of toxic substances, and handling waste responsibly.



4.0 LINKING SUSTAINABILITY TO OUR UNIVERSITY'S CORE AREAS

4.1 RESEARCH

MCU is establishing a world class renewable energy laboratory at its main campus. This lab will facilitate learning, training and promotion of renewable energy adoption and utilization. We will establish a premier hub for energy and sustainability research and cultivate internal and external collaborations to advance multidisciplinary research in energy, environment, sustainability and economic development. The interconnected and interdependent nature of these arenas transcends individual disciplines, encouraging partnerships and innovative thought. We will facilitate multi-disciplinary research partnerships utilizing the unique strengths that will be available in our university departments and institutes.

4.2 EDUCATION & LEARNING

Students at MCU will receive cutting-edge sustainability science and education through courses that educate students on sustainability. So far, within the range of our approved courses, the Bachelor of Renewable Energy Systems and Engineering largely addresses climate, environment, energy and sustainability issues. Climate change and the production and consumption of energy from fossil fuels are closely related. Fighting climate change requires an urgent transition towards a sustainable development model based on efficiency and equity, as well as a decided commitment regarding renewable energy. At the centre is what energy resources we use and how we use them. This degree programme is designed to equip its students with the scientific, engineering, analytical, economic, and management skills necessary to participate in the promotion of a sustainable low carbon economy and sustainable living.

World. Every degree programme will require every student to take a course/module in the areas of sustainability, environment, energy or climate change in order to successfully graduate and earn their degree.

We will implement of interdisciplinary research projects in the field of Life Sciences as a whole, and sustainable development in particular. We will also promote future generations of scientists, by supervising Masters Theses on sustainable development issues and topics. As a university wide initiative, sustainability conferences, symposia and further training programmes will be implemented. While we will have physical libraries, we are going to encourage to go digital on our online library and our university mobile application to cut the use of paper.

Once the University starts to operate, during our annual reviews, we will collect the following data in the future to set goals and targets:

- Number of staff who have received training on sustainability
 - Number of students enrolled in courses with sustainability as their major
 - Number of students that have pursued sustainability related careers
 - Number of students that have taken at least one class related to sustainability
 - Number of students that are involved in a sustainability teams or groups
- MCU Students will have options to choose from a variety of sustainability major or minor courses in climate change and sustainable energy systems. These courses are being designed by industry experts in these areas and are in line with the national and international priorities on climate action and sustainability. Meeting every challenge with the spirit of explorers, students discover sustainable solutions for their community and

4.0 LINKING SUSTAINABILITY TO OUR UNIVERSITY'S CORE AREAS

4.3 UNIVERSITY OPERATIONS

Our commitment to sustainability will be reflected in our campus operations. We will ensure that our University is a meeting point for learners, thinkers and doers in sustainability actions. From a large-scale solar energy initiative, solar energy lab, waste management centre, energy savings projects to personal choices to recycle, we hope to lead by example, walk the talk and make an impact locally and globally. We are going to establish a Campus Sustainability Committee (CSC) that will oversee all aspects of campus sustainability-related operations including energy, climate, water, food, waste, buildings, people, land and biodiversity, purchasing, and transportation. This committee will be comprised of representatives from faculty, staff, and students. The CSC will also

enforce and monitor the implementation of our sustainability strategy and the sustainable procurement policy.

While the Campus Sustainability Committee (CSC) will comprise of faculty and students, it will be chaired by the University President. It will have sub committees/teams that are in charge of enforcing sustainability goals in different areas of the campus and ensure that goals and targets are reached. These sub-committees/teams are Climate and Energy Team, Water Team, Waste Team, Transport Team, Land and Biodiversity Team, Buildings Team, and the Procurement Team.

4.4 UNIVERSITY GOVERNANCE

At MCU, environmental sustainability serves as a guiding principle in our planning and decision-making. The University President and Board will ensure the maintenance of a robust compliance framework (including regulatory and legislative compliance) related to environmental issues as they are equally important to other issues.

4.5 SUSTAINABLE GREEN CAMPUS

We endeavor to cultivate a campus culture of sustainable living behavior. Our campus will be kept as pristine as possible and it will be a dense, green, and compact campus. Buildings are a major consumer for energy on campus. All new buildings on our campus sites will be done with 'zero emissions-ready' approach and will be fully equipped with on-site power generation through solar and biogas plants. We will practice energy demand management and ensure all our equipment is energy efficient. Overall, we will apply zero emissions-ready approach to all campus development projects.



We will also explore opportunities for off-campus power generation and enter into power purchase agreements to generate and supply clean energy to the national grid. Further opportunities will be explored to utilize market mechanisms to offset our carbon footprint so that we completely go carbon neutral by 2025.

4.0 LINKING SUSTAINABILITY TO OUR UNIVERSITY'S CORE AREAS

4.6 PUBLIC ENGAGEMENT

The MCU will use its knowledge and systems for the public good, striving to turn research into action through sustained collaborations and partnerships at local, national, and international levels. In order to advance our commitment to sustainability, we rely on strong governmental, corporate, and two-way community partnerships. We will engage the community around us, the government, private sector, non-governmental organizations and fellow universities to drive



sustainability activities and increase ambition to save the planet. These collaborations provide the mutually beneficial exchange of knowledge and resources between MCU, communities, organizations, and other stakeholders as they make crucial decisions for a sustainable future.

5.0 CURRENT SUSTAINABILITY PLANS ON SITE

PROPOSED SOLAR POWER PILOT PROJECT

The proposed solar power pilot project at our campus aims to effectively showcase the solar energy technology convincingly on an international stage at our prestigious institution to enable the technology's visibility and uptake.

ROOFTOP SOLAR

We are proposing to install 2 x 18kW Solar Kits on the roof tops at the buildings at MCU. Each of the two solar power systems will produce 18 kW or 18,000 watts of solar power with 60 SW300 Mono panels. This system will have optimizers to increase system performance, minimize shade impact, and provide monitoring of each solar panel.

The 2 x 18kw solar plant kits will have the following components:

- 120 Solar Modules (panels) Plus 300 watt model SW300 Mono
- 120 Power Optimizers model P300
- 4 Inverters (with high surge capability)
- 8 x 100' PV wires with MC4 connectors
- 2 x Integrated safety switch disconnect boxes
- 24/7 panel monitoring equipment
- 8 x 100' PV wires with MC4 connectors
- Rooftop racks, portrait layouts, flush mounts
- Roof anchors, choose shingle flash-foot, tile hook, or metal roof brackets
- Mounting rails, splices, grounding lugs, wire clips
- Module bonding clamps
- 10 busbar design that generates up to 5 watts more power (busbar is a system of electrical conductors in a generating or receiving station on which power is concentrated for distribution)
- 2 x Rapid Shutdown Safety equipment
- DC/AC cables are required for connecting panels, inverter and to the grid.



5.0 CURRENT SUSTAINABILITY PLANS ON SITE

SOLAR WATER HEATERS

Solar water heaters will be installed at 15 rooms to heat water and this will be upgraded to more buildings including hostels, kitchen and laboratories. Solar water heating (SWH) is the conversion of sunlight into heat for water heating using a solar thermal collector. A variety of configurations are available at varying cost to provide solutions in different climates and latitudes. SWHs are widely used for residential and some industrial applications and MCU is adopting this technology at its newly built main campus. SWH is proposed at MCU because it is a cost-effective way to generate hot water for use at the institution.

We are proposing to install the Integral collector-storage systems (ICS), which has one or more black tanks or tubes in an insulated and glazed box. Cold water first passes through the solar collector, which preheats the water. The water then continues on to the conventional backup water heater, providing a reliable source of hot water. They are suitable for our climate (generally warm) because the outdoor pipes could freeze in severe cold weather. This system can save up to 65% on water heating bills using the conventional electricity.



5.0 CURRENT SUSTAINABILITY PLANS ON SITE

SOLAR TREES

Solar trees will be installed around the open spaces at the MCU campus. Solar Trees will be installed at the MCU open spaces to charge cell phones and laptops for students during lunch breaks and groups discussions. Solar trees are intended to bring visibility to solar technology and to enhance the landscape and architecture they complement at the MCU campus. Another objective of these solar tree installations is to promote awareness, understanding, and adoption of renewable energy. They will be used as a primary source of energy during outdoors and they will be complementary to rooftop solar systems, symbolizing these larger investments and their environmental benefit.



5.0 CURRENT SUSTAINABILITY PLANS ON SITE

SOLAR POWERED ELECTRIC FENCE

Around the MCU campus, a solar electric fence will be installed to deter wild animals, livestock and intruders to gain access to the facility. The solar electric fence will have a pulsed electric current which is sent along the fence wire, about one pulse per second, from an energizer which is grounded. When the animal or intruder touches the fence it completes the circuit between the fence and the ground and receives a short, sharp but safe shock. These systems have varied applications in Agriculture, Industrial, and Forestry or Plantation sectors and this proven technology has now been adapted for domestic security applications too and MCU is also adopting this technology at its campus. The Solar Electric fence is easily constructed and maintained, it is long lasting and can be easily modified and above all it is not dependent on regular electricity supply.



5.0 CURRENT SUSTAINABILITY PLANS ON SITE

INTEGRATED SOLAR STREET LIGHT

Integrated Solar Street Lights will also be installed around the MCU compass for security purposes. Integrated Solar Street Light is a stand-alone solar system consisting of a pole, battery bank, photovoltaic module and LED or CFL luminaires and a controller. The use of solar power coupled with energy-efficient lighting/ luminaires make this environment friendly.

The configuration can be customised to the wattage and brightness required and it can be designed for dusk to dawn operations with the required number of days of autonomy. Solar Street Lights help to save big on energy bills. Instead of using the traditional halogen lamps which consume about 400 to 1500 watts of power, the solar powered LED lamps consume from 8w to 150w with a similar or better luminous intensity giving rise to bright solar powered spaces at the campus all night.



5.0 CURRENT SUSTAINABILITY PLANS ON SITE

INSTALLATION OF SOLAR POWERED AIR CONDITIONERS (A/C) SOLAR WATER PUMPS

Solar air conditioners will be installed at the MCU campus in at least in 10 lecture rooms. Solar Photovoltaics can provide the power for any type of electrically powered cooling be it conventional compressor-based or absorption-based, though the most common implementation is with compressors.

Research has shown that the solar powered A/C unit may simply use a dedicated 1kW solar PV array to drive the air conditioner, greatly reducing the energy required from the grid. In full sun, the unit can draw as little as 30 watts from the grid while producing its rated 3.5 kW cooling/ 3.8 kW heating capacity

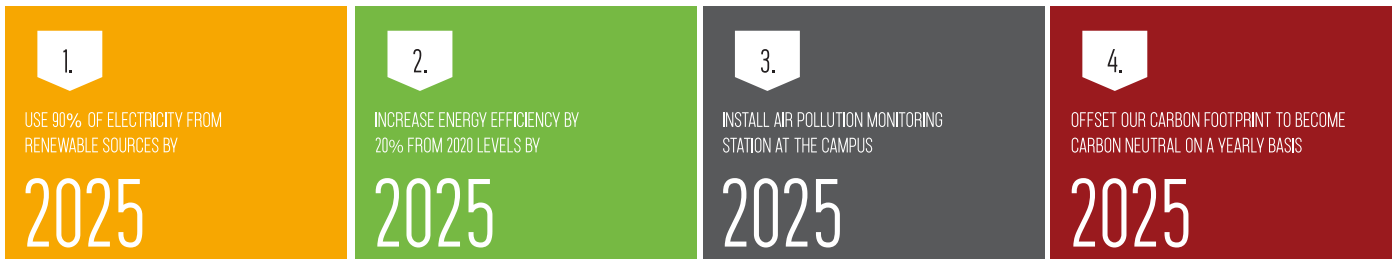
INSTALL A SOLAR WATER PUMP TO DELIVER 10 MILLION LITRES OF WATER TO THE INSTITUTION

MCU requires water to cater for over 12000 students and 3500 staff in terms of drinking, cooking, bathing, and also irrigation of crops and gardens. This translates to about 10 million litres of water requirement. Two high yielding solar water pumps will be installed at 2 boreholes.

6.0 OUR SUSTAINABILITY GOALS AND TARGETS

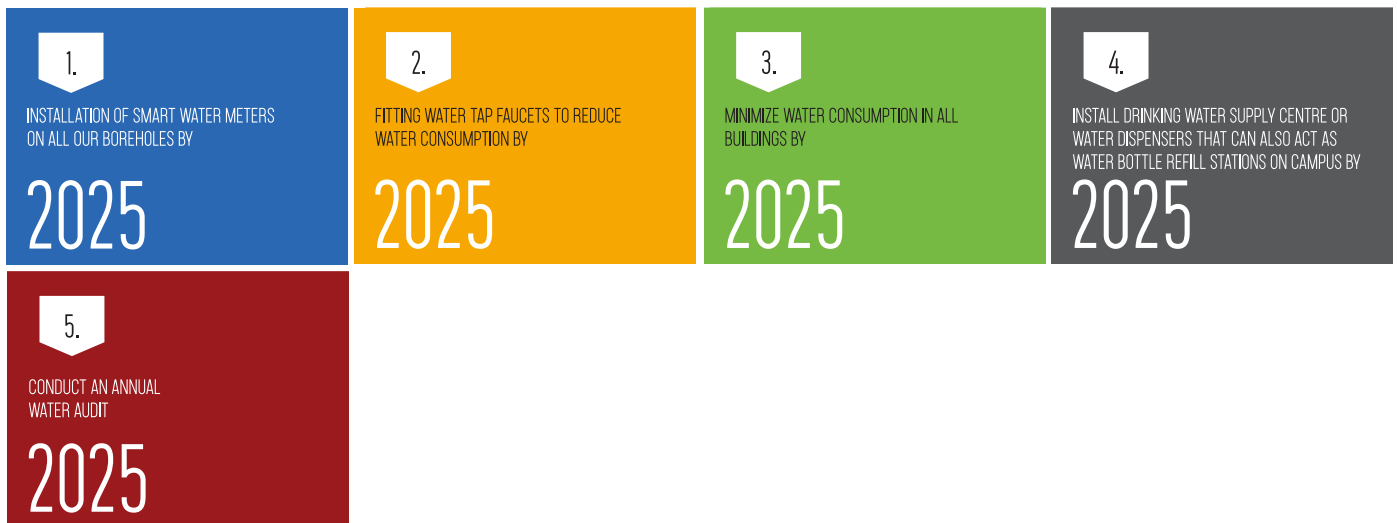
6.1 CLIMATE, ENERGY AND EMISSIONS

Goals and targets for this sector will be led by the Climate and Energy Team. Based on the year 2020 as a baseline basis



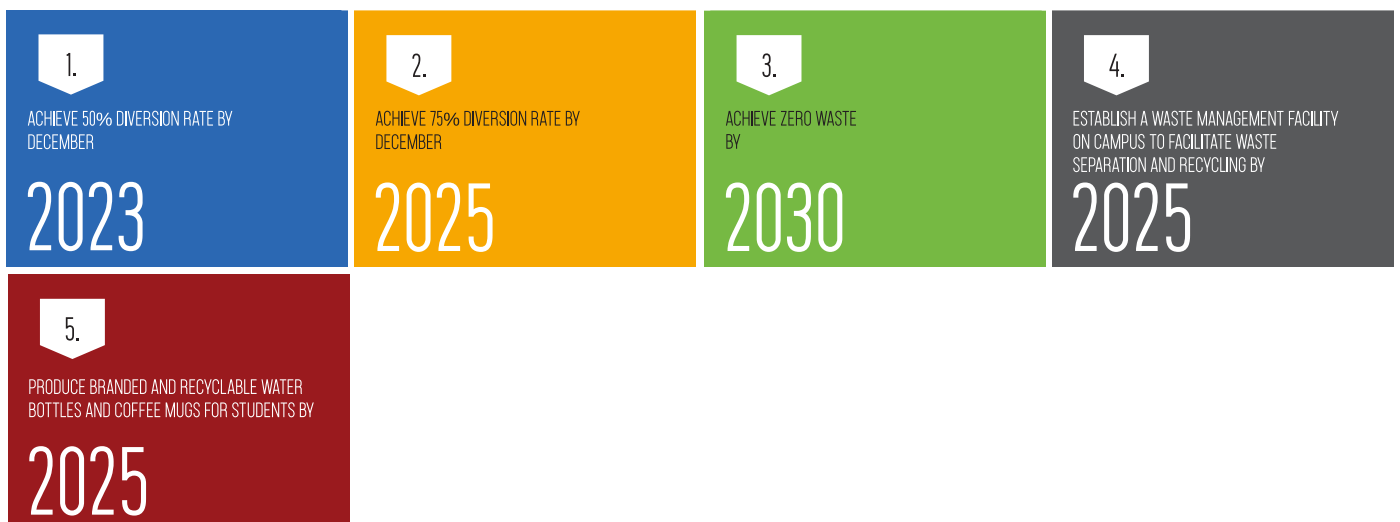
6.2 WATER AND WASTE WATER

Goals and targets for this sector will be led by the Water Team.



6.3 WASTE AND RECYCLING

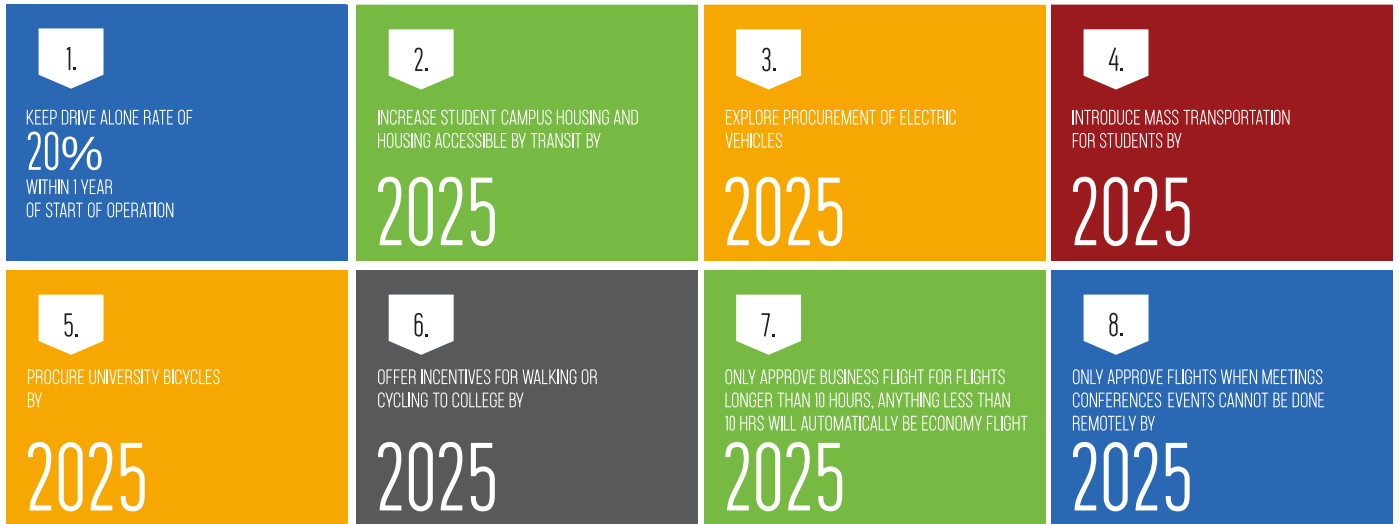
Goals and targets for this sector will be led by the Waste Team.



6.0 OUR SUSTAINABILITY GOALS AND TARGETS

6.4 TRAVEL AND TRANSPORT

Goals and targets for this sector will be led by the Transport Team.



6.0 OUR SUSTAINABILITY GOALS AND TARGETS

6.5 LAND AND BIODIVERSITY

Goals and targets for this sector will be led by the Land and Biodiversity Team. Our campus is located on a pristine ecosystem which is fragile and needs attention. We aim to:

- Maintain the pristine ecosystem in and around the campus
- Apply minimum disturbance to the natural environment during campus developments
- Improve the quality of environment and reduce amount of runoff
- Increase the number of natural spaces and native plants at the campus
- Avoid/Reduce the number of pesticides, herbicides and fungicides used
- Minimize the increase in impervious surfaces

6.6 SUSTAINABLE BUILDINGS

Goals and targets for this sector will be led by the Buildings Team. As a rule of the thumb, we endeavor to make all our buildings energy efficient. To that effect we target that:

- Install light motion sensors in bathrooms, classrooms, boardrooms and all the common rooms to reduce electric consumption
- Install waterless urinals at all our facilities
- Adopt the passive building standards to enhance energy efficiency
- Construct dorms/hostels equipped for sustainability and green living including rainwater harvesters, solar powered, solar water heating, reclaimed wood and passive lighting
- All new buildings must be at least 20% more efficient than the existing buildings. The ultimate goal is to have zero emissions in all buildings.
- MCU will design and build all new buildings and facilities to the minimum national standards or certified equivalent
- Minimize energy consumption of buildings through commissioning, efficiency upgrades, and the installation of renewable energy components (target 20% energy efficiency).

6.7 SUSTAINABLE PROCUREMENT

Goals and targets for this sector will be led by the Procurement Team. We will ensure that our purchasing practices are in favor of environmentally friendly. Following the sustainable procurement policy, this includes

- All paper to be recyclable
- No purchase of single use plastic
- Preferential purchase of Energy efficiency certified appliances
- All purchasing decisions to be made in favor of minimizing packaging waste and consider life cycle assessment

7.0 ANNEXURE

TABLE 1: ANNUAL SUSTAINABILITY METRICS AT MCU.

	2020	2021	2022	2023	2024	2025
Electricity (kWh)						
Naturaal gas (MMBtu)						
Carbon Dioxide Equivalent (metric tons)						
Borehole Water (millions of litres)						
Wastewater Generated (millions of litres)						
Landfill Waste (tons)						
Population						
Area (Square Metres)						

TABLE 2: MCU EMISSIONS BY SOURCE, 2020

Emissions Sources	Co₂ equivalent (metric tons)	Percentage Contribution
Purchased Electricity		
Onsite generated Electricity		
Air Travel		
Faculty & Staff Auto Commute		
Natural/Bio- Gas		
LP Gas		
Student Commute		
Fugitive Emissions – Refrigeration		
Water Consumption		
Solid Waste		
Campus Fleet		
TOTAL EMISSIONS		

7.0 ANNEXURE

TABLE 3: ANNUAL ENERGY USAGE AND GREENHOUSE GAS EMISSIONS AT MCU, 2020 - 2025

	2020	2021	2022	2023	2024	2025
Electricity (kWh)						
Onsite Generated Electricity (kWh)						
Natural/Biogas (MMBtu)						
Natural gas (MMBtu)						
CO₂ Equivalent (metric tons)						
Population						
CO₂ per capita (metric tons)						
Area size (Square metres)						

TABLE 4: ANNUAL WATER USAGE AT MCU, 2020 - 2025

	2020	2021	2022	2023	2024	2025
WATER (millions of litres)						
WASTE WATER (millions of litres)						

TABLE 5: ANNUAL SOLID WASTE AT MCU, 2020-2025

	2020	2021	2022	2023	2024	2025
Landfill Waste (tons)						
Diverted: Recycled + Composted (tons)						
Recycled Waste (tons)						
Composted Waste (tons)						
Diversion rate						
Population						
Landfill waste per capita (tons)						

7.0 ANNEXURE

TABLE 6: ANNUAL HAZARDOUS WASTE AT MCU, 2020 - 2025

	2020	2021	2022	2023	2024	2025
Hazardous Waste						
Extremely Hazardous Waste						

TABLE 7: COMPOSITION OF MCU CAMPUS FLEET AND FUEL CONSUMPTION, 2020 – 2025

	2020	2021	2022	2023	2024	2025
Total vehicles						
Gasoline vehicles						
Gasoline consumed(Litres)						
Diesel vehicles						
Diesel Consumed (Litres)						
Electric vehicles						
Hybrid vehicles						
Solar Vehicles						
Bicycles						
Distance traveled (kms)						
Total campus trips						
Total CO₂ emissions (metric tons)						



 Maranatha Christian University
Main Campus Mallet Farm
Kadoma, Zimbabwe

 +263718444445/6/7

 info@mcu.ac.zw

 www.mcu.ac.zw