

UNIMAS
UNIVERSITI MALAYSIA SARAWAK

Low-Carbon Campus Roadmap 2030

Community-Driven University For a Sustainable World

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Foreword

Foreword



Professor Dr. Ahmad Hata bin Rasit

Vice-Chancellor of Universiti Malaysia Sarawak

Climate change affects us, across all scales of life, from small communities to whole nations, and the consequences of a changing climate are unavoidable. The unprecedented levels of greenhouse gas emissions in recent human history are the main cause of this existential threat. As greenhouse gases accumulate in the atmosphere, they trap heat and cause Earth's temperature to rise, resulting in more extreme weather events such as droughts, floods, and intense tropical storms.

Sustainability is part of our DNA, and much of our campus's research and initiatives are focused on helping the communities that surround us transition to a greener, more resilient future. As a public institute of higher education, we have a greater responsibility to lead in climate change mitigation and adaptation efforts. While the climate change discussion has infiltrated spaces from boardrooms to parliaments, the university remains the cradle of climate change knowledge creation, communication, and corroboration. Moreover, a university has a tangible impact on society and the natural world. UNIMAS is a prime example. We educate, produce knowledge, provide services, and engage our local communities.

We want to continue to rise to the challenge of climate change; hence, the publication of our UNIMAS Low Carbon Campus Roadmap. This roadmap details the framework that will support our goal of being a low-carbon campus by 2030. It is the culmination of discussions, engagement sessions, and other forms of collaboration that have led to a roadmap that truly represents the various needs, priorities, and contributions of our campus community to a low-carbon society. It includes our motivations and decarbonisation targets, as well as the actions we need to take in the upcoming years to achieve these targets.

Although a low-carbon campus transformation may be complex and challenging, we believe that this roadmap is a critical first step towards this transition, as it will be the key document that guides the measuring, managing, and mitigating processes we will undertake to reduce our climate impact in the years to come. In this roadmap, we are laying out not only our goals for the next seven years, but the foundation for many more decades of research, innovation, and community initiatives toward decarbonisation.

We hope that this roadmap will not only inform you of our past achievements and future aspirations but inspire you, dear reader, to join us as we move upward and forwards into a sustainable future. It is an invitation to take part in a greener future, where opportunities to prosper are abundant for all, regardless of creed and circumstance. It is our hope for the future of UNIMAS, made resilient to the impacts of climate change.

Foreword



Professor Ir. Dr Siti Noor Linda Binti Taib

Chairman of the UNIMAS Low Carbon Campus Roadmap Steering Committee

A low-carbon campus roadmap is a strategic plan designed to encourage all UNIMAS students, faculty, and staff to reduce their carbon footprint. Through the implementation of the strategic actions outlined in this UNIMAS Low Carbon Roadmap 2030, it will substantially reduce the amount of greenhouse gases, particularly carbon dioxide, that its operations emit. Among these activities are energy consumption, transportation, and waste management. The objective of a road map for a low-carbon campus, which is aligned with Sustainable Development Goal 13, is to identify areas that emit significant amounts of carbon dioxide and to find approaches to reduce these emissions.

A roadmap for a low-carbon campus involves establishing goals and implementing measures that will reduce greenhouse gas emissions. These objectives and actions include increasing the use of renewable energy sources like solar power, implementing energy efficiency measures in buildings, promoting sustainable transportation options like bicycling and public transportation, and reducing waste. To ensure that everyone is involved in the process of reducing the university's carbon footprint, the roadmap also prioritises engagement with faculty, staff, students, and other stakeholders. The ultimate objective of a roadmap for a low-carbon campus is to assist UNIMAS in becoming more sustainable and contributing to efforts against climate change. It is essential to recognise that the success of the Low-Carbon Campus Roadmap 2030 relies on the participation of all UNIMAS communities from all departments and at all levels.

Sincere gratitude and appreciation are extended to the members of the steering committee, the working committee, the researchers, and those involved in the planning and execution of this road map. The successful implementation of this road map was crucial for demonstrating our commitment to achieving a low-carbon campus.

Foreword



Professor Ts. Dr. Shanti Faridah binti Salleh

Chairwoman of the UNIMAS Low Carbon Campus Roadmap Working Committee

When questioned about the unusually warm British summer in 2012, Sir David Attenborough did not hesitate to highlight climate change. "There is no question that climate change is happening; the only arguable point is what part humans are playing in it," he said. "I would be absolutely astounded if population growth and industrialisation and all the stuff we are pumping into the atmosphere hadn't changed the climatic balance. Of course it has. There is no valid argument for denial." For Attenborough, whose life revolved around sharing the wonder of nature with the world, it was clear that uncontrolled human activity was the main driver of climate change. More than ten years later, his concern has only been echoed and amplified by people of all ages, sectors, and disciplines, including us at UNIMAS.

The UNIMAS Low Carbon Campus Roadmap 2030 is our response to the global climate change challenge. Creating this roadmap has given us the opportunity to identify our strengths and areas of improvement as well as bolster our relationships with the public sector, industry, and local communities. As we engaged our stakeholders in a thorough consultation process, we witnessed first-hand the aspirations of our campus community – from staff to students – for a greener, more sustainable UNIMAS. Indeed, the previous initiatives of our staff and students have already greatly contributed to global climate change adaptation and mitigation efforts. The UNIMAS Low Carbon Campus roadmap seeks to expand the work of our campus climate trailblazers by presenting a united front on climate change in the form of an institution-wide strategy.

In the process of producing this roadmap, it has become apparent to us that collaboration is the only way to meaningfully address climate change. That is why collaborative action is one of the main driving forces of our roadmap. We have witnessed that when working together, our expertise and efforts become more than the sum of their individual parts. To deliver the ambitious goal of becoming a low-carbon campus, we strive to create an environment that fosters synergy among members of the campus community, government agencies, industry partners and the general public.

My hope is that as you peruse this roadmap, you will be encouraged to take part in our campus' climate initiatives; that this roadmap will serve as a spark for creative, goal-oriented discourse that is necessary in achieving our decarbonisation goals. If any ideas, questions, or recollections are generated, I hope that you are emboldened to share it with us. We wholeheartedly invite partners and collaborators for any one of our initiatives, or even for potential new projects related to climate change adaptation and mitigation. While we are proud of the roadmap thus far, we know that climate change is a complex and ever-evolving issue, and it needs the minds of many – including yours – to come together to chart the best path towards UNIMAS carbon neutrality.

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Steering Committee



Professor Ir. Dr Siti Noor Linda Binti Taib

Chairman



Professor Ts. Dr Shanti Faridah Salleh

Member & Chair of Working Committee



Professor Ir. Ts. Dr. Al-Khalid bin Hj Othman

Member



Professor Dr. Lo May Chiun

Member



Professor Dr. Awang Ahmad Sallehin bin Awang Husaini

Member



Professor Madya Ts. Noraziah Binti Abdul Wahab

Member



Professor Gs. Dr. Tarmiji Bin Masron

Member



Ts. Humphrey Rayang Ak Nelson Janang

Member



Dr Atta Idrawani bin Zaini

Member



Professor Ar. Nurakmal Abdullah @ Goh Tuo Ho

Member

Working Committee

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UNIMAS UNIVERSITI MALAYSIA SARAWAK UNIVERSITY SUSTAINABILITY CENTRE | SQRC Strategy Quality Risk Centre

UNIMAS UNIVERSITI MALAYSIA SARAWAK | UNIMAS CORPORATE

UNIMAS UNIVERSITI MALAYSIA SARAWAK | UNIMAS INNOVATION

UNIMAS Development Office
Registrar's Office
HEPA

Implementation Committee

Faculties
Institutes
Centres

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UNIMAS Low Carbon Campus Roadmap Overview

Vision	To become a low carbon campus that embodies sustainable growth.
Goals	Environmentally responsible organisation Ready for the green economy Active citizens for climate change

6 Strategic Pillars

Energy efficiency	GHG inventory	Circular economy & waste management	Capacity & capability building	Sustainable innovative solutions	Low carbon mobility

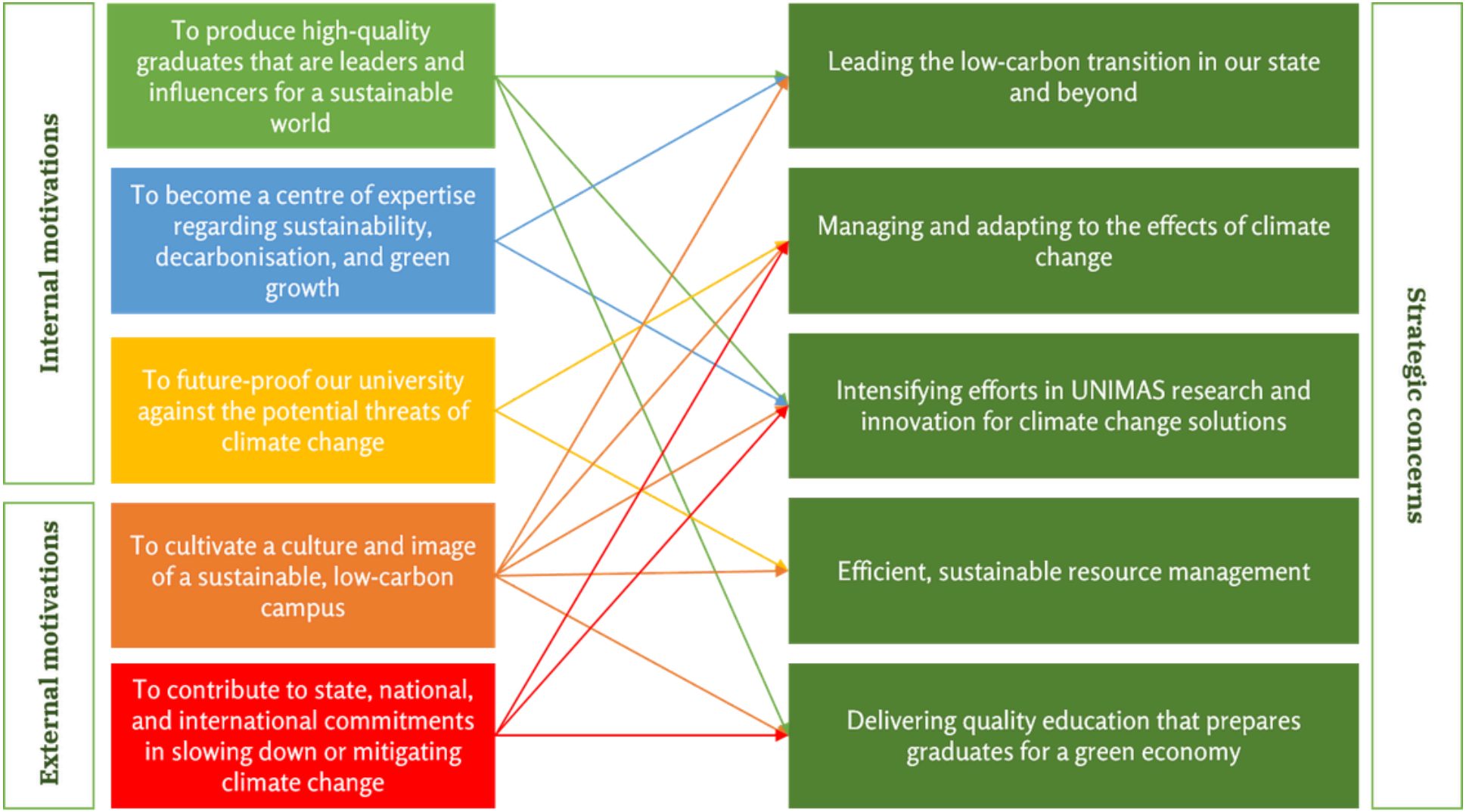
22 Strategies

7	3	4	2	4	2

Key Enablers	Good governance & framework | Financial sustainability | Raised awareness & outreach | Low carbon research & discovery
Values	Exemplary | Collegiality | Integrity | Tenacity | Equity

Our Motivations and Concerns

We see a clear connection between our motivations - internal and external - and the strategic concerns in formulating this roadmap.





UNIMAS Vision

A Leading Global University for a Sustainable Future

Having recognised the contemporary threat of climate change and unsustainable growth, we revised our vision to reflect our new commitments to sustainability values, research, and education. To us, there is no growth but green growth - we want to enhance our university's productivity while ensuring that our natural heritage is preserved for future generations to come.

UNIMAS Mission

To enhance the social and economic impacts on the global community through the pursuit of excellence in teaching, research, and strategic engagement

We believe that climate change and environmental degradation are the greatest challenges facing our society and economy today. Hence, we are constantly orienting our teaching, research, and strategic engagement to foster creativity and innovation for a sustainable world.

Our Values

Five values form the core of who we are - exemplary, collegiality, integrity, tenacity, and equity. In everything we do, these values motivate us to strive for excellence. Our transition to a low carbon campus is no exception. As we work towards a greener future, these values guide our efforts:



Exemplary. As a local university, we need to model a low-carbon lifestyle to the communities that surround us. We believe in walking the talk of reducing greenhouse gas emissions, so that others may follow suit.



Collegiality. We know that we cannot transition to a low-carbon campus with the efforts of a few people. We know that it is an effort involving the whole campus community, bringing together their various talents, skills, and expertise to contribute to reducing greenhouse gas emissions across the university.



Integrity. We want to be sure that we are constantly improving in our efforts to combat climate change. We want to commit to clear and achievable goals that can be measured, so that we can plan next steps towards an even lower carbon campus.



Tenacity. Climate change will affect many aspects of our campus operations. We want to build resilience into the systems and infrastructure that are the bedrock of our university, ensuring that our role as community influencers and innovators lasts through the generations.



Equity. We believe that everyone in our university deserves a safe environment that offers fair opportunities to all. Under the threat of climate change, this will no longer be possible. Hence, we aim to contribute to global carbon emission reduction targets, we will ensure the welfare of our present and future community members.



Our Region

Our thriving campus community, comprised of more than 20000 students and 2000 staff, is located on the island of Borneo, a region characterised by its myriad of cultures and mega-biodiversity. As a landmass with seven distinct ecoregions, ranging from lowland to montane forests and peat to freshwater swamps, it is no surprise that the wonder of our island sparked Alfred Russel Wallace's highly influential Sarawak Law paper, a defining article in the history of evolutionary theory. Much like Wallace, our university's research and innovation are inspired by Borneo, our home and heritage.

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Our Alignments

Our Alignments

Sustainable Development Goals

Our low-carbon targets are informed by the Sustainable Development Goals (SDG) – particularly SDG 7, 11, 12, 13, 15 and 17. We aim to leave a positive mark on our local communities and the global stage by scaling these goals to suit our campus' vision, mission, and low-carbon targets.



We will take every opportunity to adopt affordable and clean energy to power our campus' daily operations.



We will build a campus community that is resilient and ready for the multidimensional effects of climate change.



We will inculcate responsible consumption and production habits among our staff and students. We will also model these sustainability values to local communities and our industry partners.



We will be known as a campus that welcomes and encourages climate action. We strive to be a platform where members of our campus community and beyond can come together to create and innovate new sustainable solutions.



As a university situated in one of the most biodiverse regions on earth, we will make every effort to conserve life both on- and off-campus. We will continue to make positive contributions to our natural surroundings through our research and projects.



When undertaking the strategies outlined in this roadmap, we will actively seek out fruitful partnerships for the goals. We will extend an invitation for collaboration and synergy to all members of our campus and local community, as well as the private & public sectors.

Our National Alignments

National Alignments

The Malaysian government has always been ambitious when it comes to decarbonising our nation. Malaysia submitted an updated Nationally Determined Contribution in 2021, targeting a 45% carbon intensity reduction, and expanding their inventory to include carbon dioxide, methane, and nitrous oxide - hydrofluorocarbons, perfluorocarbon, sulphur hexafluoride, and nitrogen trifluoride. We also look to support the following climate change-adjacent policies and frameworks:



National Policy on Climate Change



Dasar Pengurusan Sisa Pepejal Negara 2016



Dasar Tenaga Negara 2022 - 2040



Environmental Sustainability in Malaysia 2020 - 2030

LCCF.MY
MALAYSIAN GREEN TECHNOLOGY & CLIMATE CHANGE CORPORATION

Low Carbon City Framework



National Low Carbon Cities Masterplan

Our Alignments

State Alignments

We believe that our low-carbon campus transition will support Sarawak's targets for green economy initiatives and capacity building - as outlined in Sarawak's ***Post Covid-19 Development Strategy 2030*** - especially in the environmental services sector.



Green economy initiatives

We aim to support the Sarawak's Government's plan in developing a GHG inventory for all economic sectors and cities by starting with our own campus in Kota Samarahan. As a result of this roadmap, we will contribute comprehensive digitalised data relating to our carbon emissions.

Capacity building

Engaging our students in sustainability initiatives and inculcating carbon and climate awareness will prepare them for Sarawak's new economy focused on green growth. We will produce graduates and experts that are ready to assist Sarawak's transition to a service economy, particularly in the environmental services sector.



We also want to contribute to Sarawak's ***Climate Change Centre*** through the exchange of knowledge and expertise gained through the implementation of this roadmap. In addition, our university's aspirations for a low carbon campus is aligned to Sarawak's ***Digital Economy Blueprint*** and the ***Kuching Smart City Masterplan***.



Our Alignments

UNIMAS Alignments

In our journey towards low carbon, we also aim to uphold the existing commitments made by the university towards sustainability and green growth. We are incorporating the following plans and policies:

UNIMAS Low Carbon Campus Roadmap 2030

- **UNIMAS Development Plan (2002)**
- **UNIMAS Energy Policy (2018)**
- **UNIMAS Strategic Plan 2021 - 2025**
- **UNIMAS Sustainability Master Plan 2021 - 2025**

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3M Approach

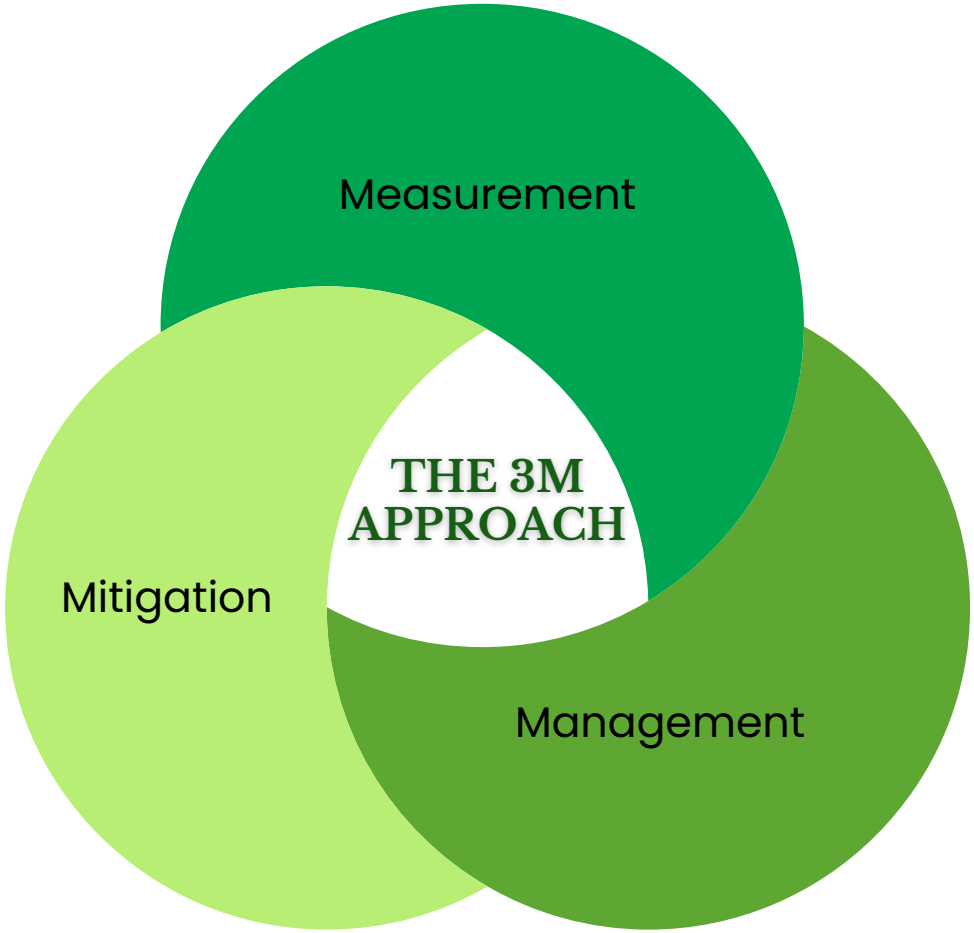
3M Approach

When developing our key initiatives, we kept in mind the 3M approach. The 3M approach consists of three (3) key actions:

- **Measurement** – Measuring GHG emissions allows us to establish a baseline and continuously monitor our carbon footprint, enabling us to tailor our management and mitigation approach to suit our emission targets.

- **Management** – To ensure the success of our low carbon transition, we need to manage our policies, targets, and planning to reflect the best implementation strategy.

- **Mitigation** – We are taking substantial actions and steps to reduce our greenhouse gas emissions through initiatives that target every dimension of our campus' operations.



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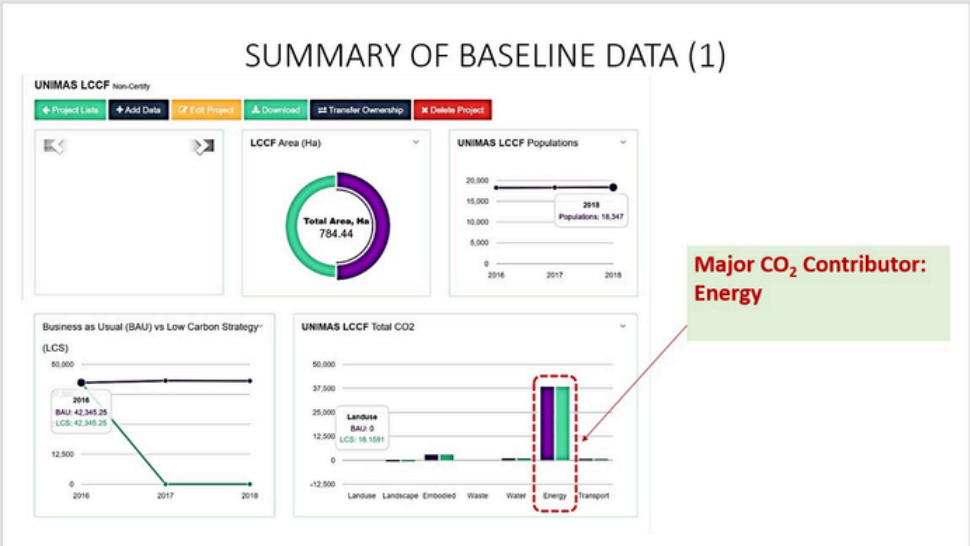
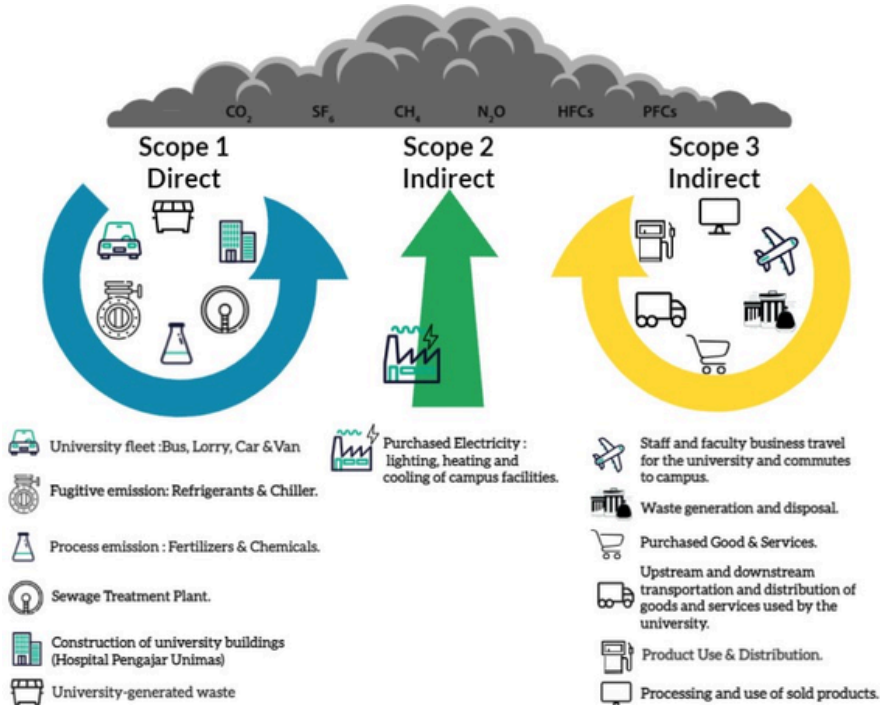
Calculating Our Climate Impact

Calculating Our Climate Impact

Our campus is a hub of activity – academic and otherwise. When inventorying our GHG emissions, we categorise our campus' emissions following the three (3) scopes defined by the GHG Protocol, the leading international greenhouse gas emissions standards and frameworks provider. We have previously undertaken an inventory of our carbon emissions in 2018, resulting in the baseline data utilised in this roadmap. This inventory of emissions allowed us to pinpoint our strengths and areas of improvement when developing our low carbon campus roadmap.



Carbon emissions baseline data summarised in 2018, based on 2016 emissions.



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Localising The Paris Agreement To Our Campus Community

Localising The Paris Agreement To Our Campus Community

Localising the Paris Agreement is a process that involves defining, implementing, and monitoring GHG emission reduction strategies on the smaller, local scale, allowing sub-national entities – like a university – to advance progress in the Nationally Determined Contributions (NDCs). Universities have always been the beating hearts of social and economic transformation, and the transition to a carbon-neutral society and economy is no different. Though the Paris Agreement was written by and for national governments, we acknowledge the fact that universities need to be proactive in contributing to the national government's commitments.

	Paris Agreement	*Our Campus*
Article 4	Preparing NDCs and long-term low GHG emissions strategy	Setting targets in an action plan towards reducing GHG emissions
Article 5	Conserving and enhancing, as appropriate, sinks and reservoirs of GHGs	Conserving or planting forested landscapes within campus boundaries
Article 6	Voluntarily cooperating with other countries through market- and non-market approaches	Cooperating with the community, private sector, local government, and other universities
Article 7	Enhancing capacity, strengthening resilience, and reducing vulnerability to climate change	Building the capacity and resilience of our campus community through climate initiatives and programs

Article 10	Realising technology development and transfer to improve resilience to climate change and reduce GHG emissions	Researching and developing solutions for climate change issues
Article 11	Implementing adaptation and mitigation activities	Implementing GHG emissions reduction activities within the campus
Article 12	Enhancing awareness of climate change; providing public participation and access to climate change-related information.	Hosting outreach and awareness programs related to climate change and sustainability for staff, students, and community members
Article 13	Transparency and accounting systems to build mutual trust, confidence, and to promote effective implementation	Establishing a GHG inventory, providing public access to our carbon reduction roadmap, and obtaining green certifications

Localising Malaysia's commitments in the Paris Agreement involves a two-way approach, where national goals and policies are adapted to suit the unique circumstances, challenges, and priorities of our campus community. In addition, localising our country's climate goals and commitments involves weaving sustainability principles and practices into the very fabric of our daily campus operations and activities. Looking at the Paris Agreement, we highlight eight ways to achieve localisation of the Agreement to our campus community.

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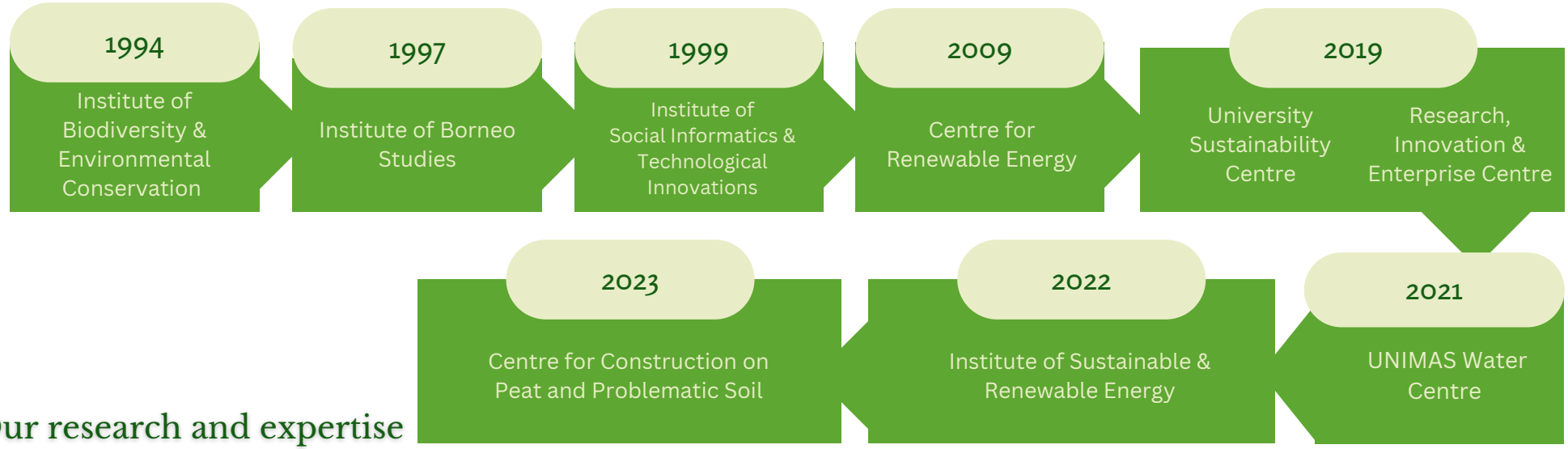
Our Journey So Far

Our Journey So Far

Our roadmap emerged from the collective efforts, experiences, and expertise of our campus community members. Collectively, we are able to rise to the challenge of a low carbon campus transition. Though uncertainty is part and parcel of any transformation, we are confident that our campus community is equipped to respond to the dynamic nature of a carbon neutral transition.

Our Institutions

Several university-based organisations are already directly addressing our university's sustainability and decarbonisation concerns. They will continue to support the implementation of our low carbon roadmap through their research and other initiatives.



Our research and expertise

As a leading local university, UNIMAS has always played a crucial role in driving forward research related to decarbonisation and the environment in the region. Our reputation as experts in sustainability are the result of our research activities, resulting in scientific discoveries, innovations, and novel applications.


Digitalisation and IoT in energy grids
Hybrid photovoltaic-hydro power systems
Biomass energy
Micro-hydro energy
Hydrogen energy
Microbial fuel cell
Energy
Sustainable Livelihood Index
Circular community
Indigenous knowledge
Climate Resilience
Community
Utilising palm oil mill effluent
Wastewater treatment
Utilising sago waste
Solid waste management
Waste Management
Our Research & Expertise
Biodiversity
Ecological Impact Assessment
Mangroves
Blue carbon
Biosystematics
Vegetative propagation techniques
Spatial forest assessment
Integrated multicriteria decision making approach
Behavior model to determine the usage of EFFP
Circular Economy
Ecotourism
Understanding bidirectional causal relationship between carbon dioxide,economic growth and energy consumption

Our Past Achievements

1999 2002 2010 2018 2019 2021 2022 2023

Eco-campus
Our campus is designed to be a pedestrianised and accessible campus. It was also designed to be in harmony with the natural ecosystem of the site, as well as to be a part of an integrated sustainable energy system. Sustainability, with an aim of having a minimal impact on the surrounding environment, has been part of this campus' DNA since its inception.

Bicycle lanes
We designated approximately 4.2 km of bicycle lanes within our campus, making cycling a safer and more convenient mode of transport for members of our campus community.

The CUBE
The CUBE is a 2574 m² space housing 199 lecturers, with its own photovoltaic system and a rainwater harvesting system to reduce water consumption.

Takasago-UNIMAS Forest
A joint collaboration between UNIMAS, Takasago Thermal Engineering Co., Ltd and Japan-Malaysia Association, this educational forest was planted with over 20000 trees from different species.

UNEP Little Book of Green Nudges
UNIMAS was selected as a pilot campus for the "The Little Book of Green Nudges" initiative organized by the United Nation Environment Program (UNEP).

Impact in Society Awards
A team led by UNIMAS lecturer, Dr Then Yi Lung, won the Impact in Society Awards for Sustainability and Climate Change. Their Alternative Lighting Project created clean, sustainable energy for rural Sarawakian communities.

GRI & ESG reporting
Publishing a GRI-based ESG report to establish transparency and accountability over UNIMAS' environmental, social, and governance aspects.

e-bario
Sustainable social development through information and connection technologies in the remote communities of Sarawak.

Student Pavilion
The Student Pavilion, our campus's premier hub of activity, was designed according to green building principles, with features such as rainwater harvesting.

Real Living Lab
The Real Living Lab was established to showcase the biodiversity in Sarawak through research and eco-tourism activities.

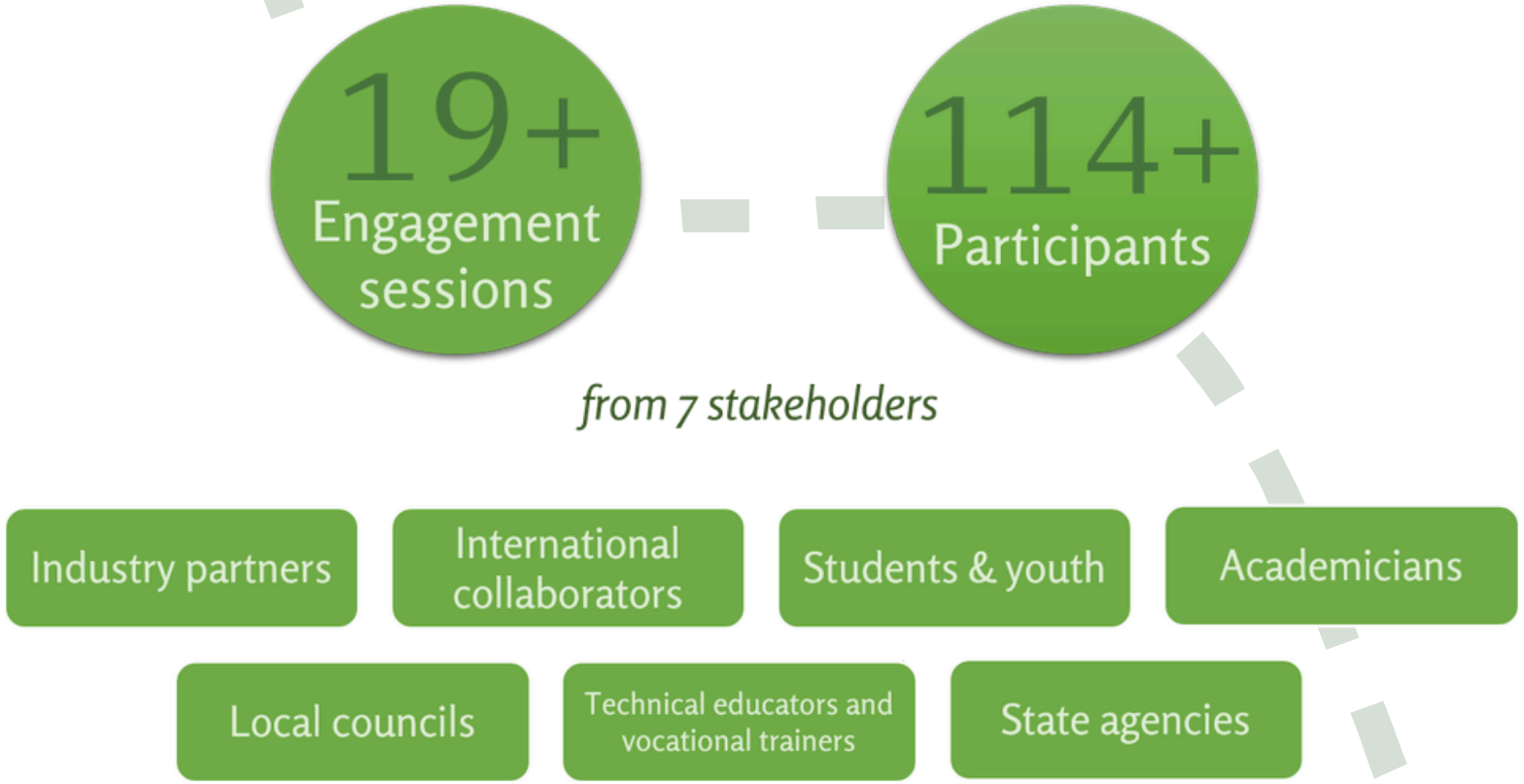
ASEAN Energy Award
In recognition of a micro-hydro project that helped power agricultural food processing activities by the rural community of Kg. Assum to generate a sustainable income.

Electric scooters
Our university, in collaboration with Asia-Pacific's largest micromobility operator Beam, provided electric scooters as a first- and last-mile transport solution for our campus community.

THE Ranking
Achieved a THE Impact Ranking for Climate Action, Responsible Consumption and Production, and Affordable and Clean Energy of 401 - 600th place, above 70% of ranked universities.

Our Engagement Process

Engaging our stakeholders is crucial during the development of our roadmap. We have provided opportunities for our campus and surrounding community members to participate in its creation so that the roadmap targets and priorities are in line with their aspirations. Our engagement sessions are wide-ranging, as our university is far-reaching in its impact throughout the region.











Our Process in Producing The ULCC Roadmap

ISuRE Carbon Neutral Townhall

Aimed to gain inputs and feedbacks from various stakeholders, as well as create collaboration opportunities with various industries in the effort to achieve a carbon neutral campus.

Smart & Sustainable City Hackathon

Running a 72-hour hackathon to generate ideas that help overcome challenges within the state regarding sustainability.

Brainstorming workshop on Carbon Neutral Campus Framework

Engaging our public stakeholders on defining a carbon neutral campus framework.

Action Plan for UNIMAS Low Carbon Campus Roadmap 2030 Workshop

Productive group discussions were held, which resulted in the inception of the strategic pillars and strategies.

Engagement session with non-academic staff

Engaging our non-academic staff for their input on the UNIMAS Low Carbon Campus Roadmap, taking into consideration their concerns and priorities.

Engagement session with UNIMAS students

Engaging our students for their input on the UNIMAS Low Carbon Campus Roadmap, taking into consideration their concerns and priorities.

Engagement session with University Deans & Directors

Engaging our deans and directors for their input on the UNIMAS Low Carbon Campus Roadmap, taking into consideration their concerns and priorities.

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Overcoming Potential Challenges

Overcoming Potential Challenges

Potential challenges

leadership or high-level buy-in

complex institutional structure and management

an institutional culture that is rooted in business-as-usual

lack of bottom-up buy-in

need of climate champions

branding & credibility

difficulty in scaling solutions

ease in obtaining financing

lack of funding sources

need of dynamic approach to skills & expertise

technology transfer

research facilities

Our enablers

Good governance & framework

Our framework is this roadmap document, and it delineates our goals, motivations, and ownership of the initiatives that need to be taken under the five focus areas to achieve decarbonisation. Our robust organisational structure, helmed by visionary leadership, facilitates the systems that ensure the success of our low carbon roadmap. Our good governance inspires action, welcomes innovation, and encourages accountability.

Awareness and Outreach

As a community-driven university, we have always played a central role in connecting academia to industry, the public sector, and community at large. Our promotion and outreach can facilitate new and productive collaborations with other interested parties such as private businesses and other universities, in addition to garnering strong support from our campus community. We are leveraging our existing 135 (and expanding) regional and global network worldwide to promote and build a network for collaboration towards the low carbon campus effort.

Financial sustainability

As a public higher education institution, we have access to multiple sources of funding. UNIMAS has embarked on ESG and sustainability reporting as part of of our financial sustainability.

Low carbon research and discovery

As a leading university in our region, we are leveraging our intellectual capital in low-carbon technologies. Our experts and students are involved in a multitude of research projects, across a range of disciplines, which will offer insight and solutions to the decarbonisation challenge.

UNIMAS Low Carbon Campus Roadmap Completion

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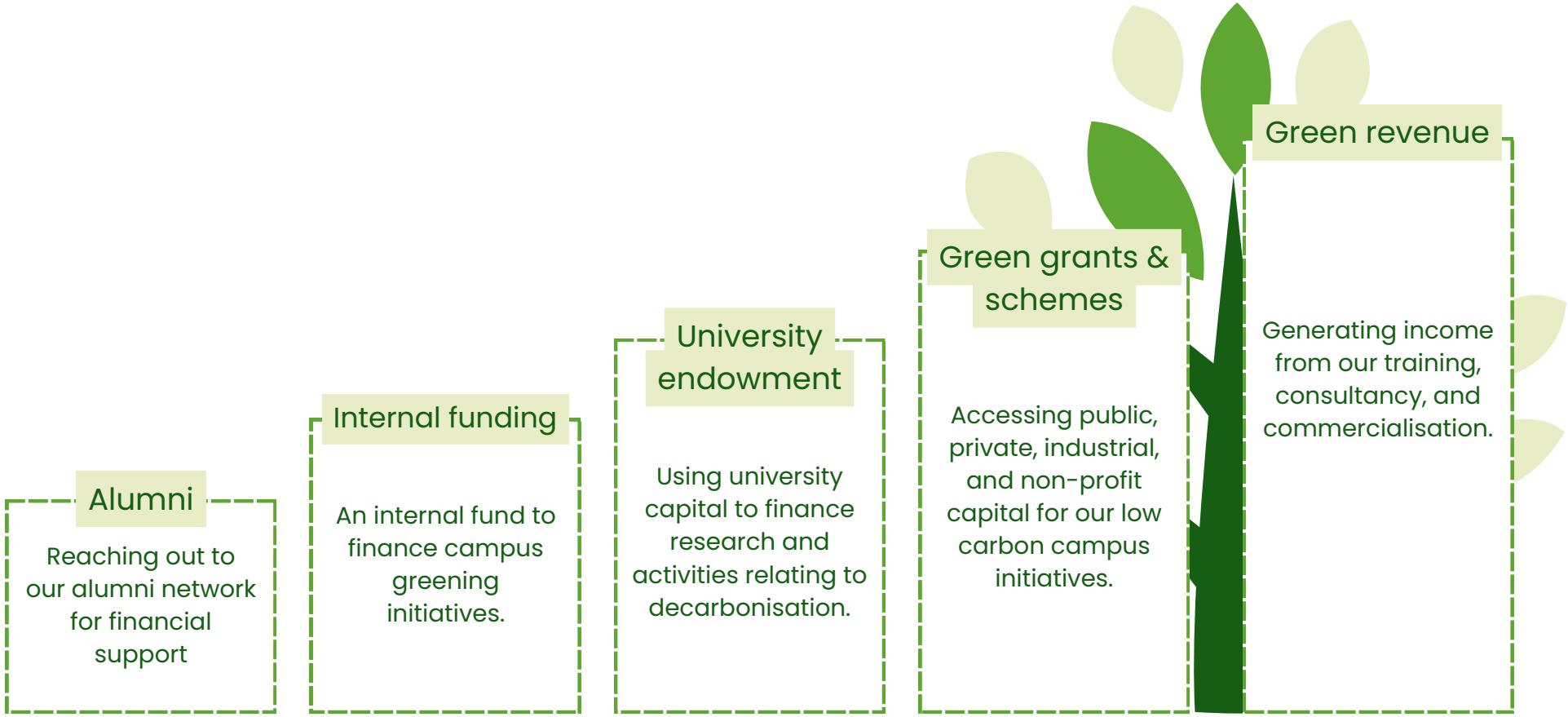
Our Financial Sustainability

Our Financial Sustainability

We are ready to funnel financial resources to fund a new, low-carbon future. Though the upfront costs may be high, we acknowledge that the resulting benefits far outweigh them. While internal sources of funding ensures the success of our roadmap, we are also looking to forge financial partnerships with public, private, industrial, and non-profit organisations.



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Benefits of A Low Carbon Roadmap

forecasting and managing energy demand

GRI- and ESG-compliant

accelerate climate adaptation & mitigation

branding & visibility

circular campus

climate nature-based solutions

targets scope 1, 2, and 3 emissions

increased staff and student engagement

energy security

transferring knowledge with the community

developing staff and student skills

Benefits
of A Low Carbon Roadmap

A low carbon roadmap provides many opportunities for growth. We look forward to reaping the fruits of our efforts, from financial savings to increased community engagement.

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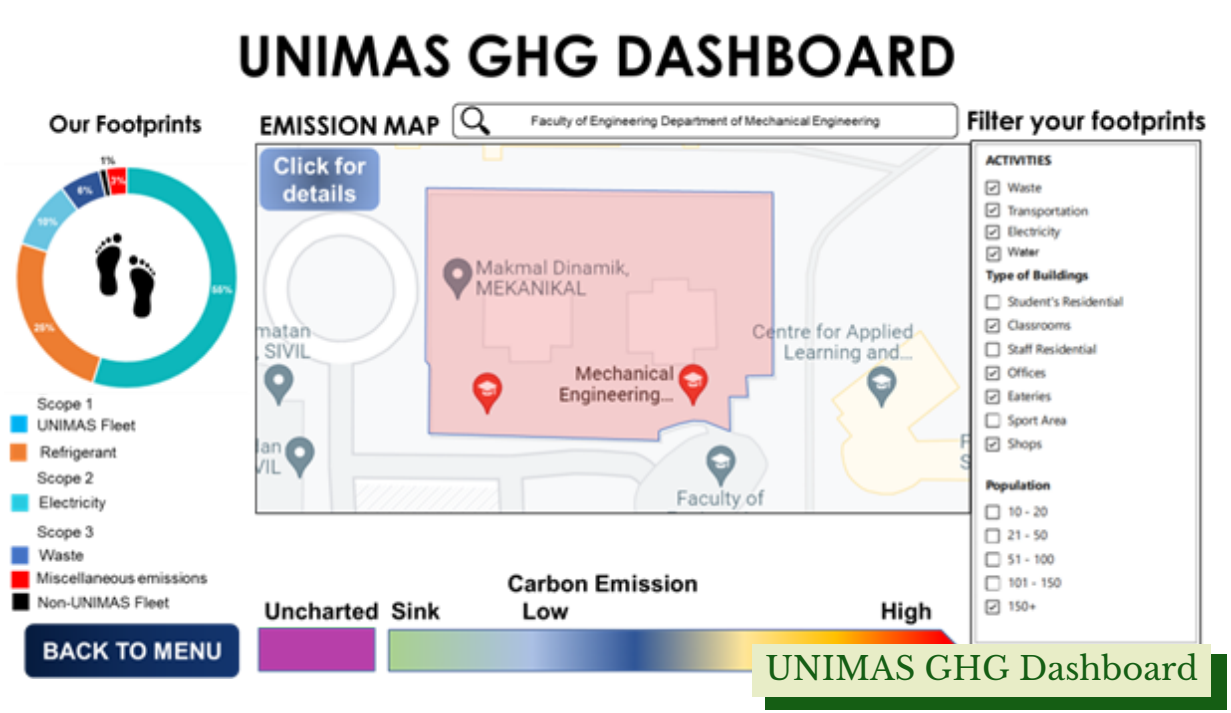
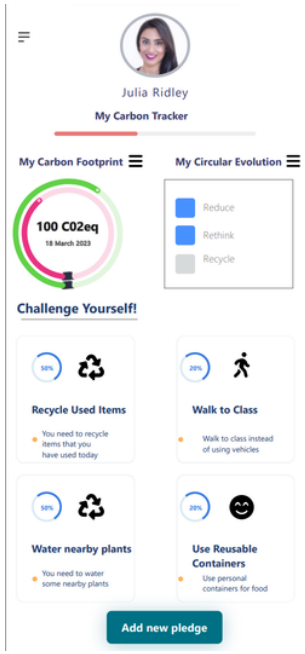
Measuring Performance

Measuring Performance



UNIMAS GHG Dashboard





UNIMAS 4SEE App

This roadmap ensures that we are on track to achieve low carbon campus status by laying out actionable goals towards decarbonisation. To monitor our performance, we will establish and continuously update a comprehensive greenhouse gases inventory. The inventory is supplemented with our 4SEE mobile application that our campus community will use to measure their personal carbon footprint. Enhanced by records of both campus-wide and personal carbon footprints, this inventory will track consistent improvements in our carbon footprint as we achieve our decarbonisation milestones.

We also seek to dynamically respond to the changing landscape of climate solutions as new knowledge and technologies come to light. Thus, yearly reviews are key to the success of our low carbon campus journey. Yearly reviews allow us to assess our progress, pursue promising avenues, and ensure the effectivity of our roadmap.

Science-Based Targets

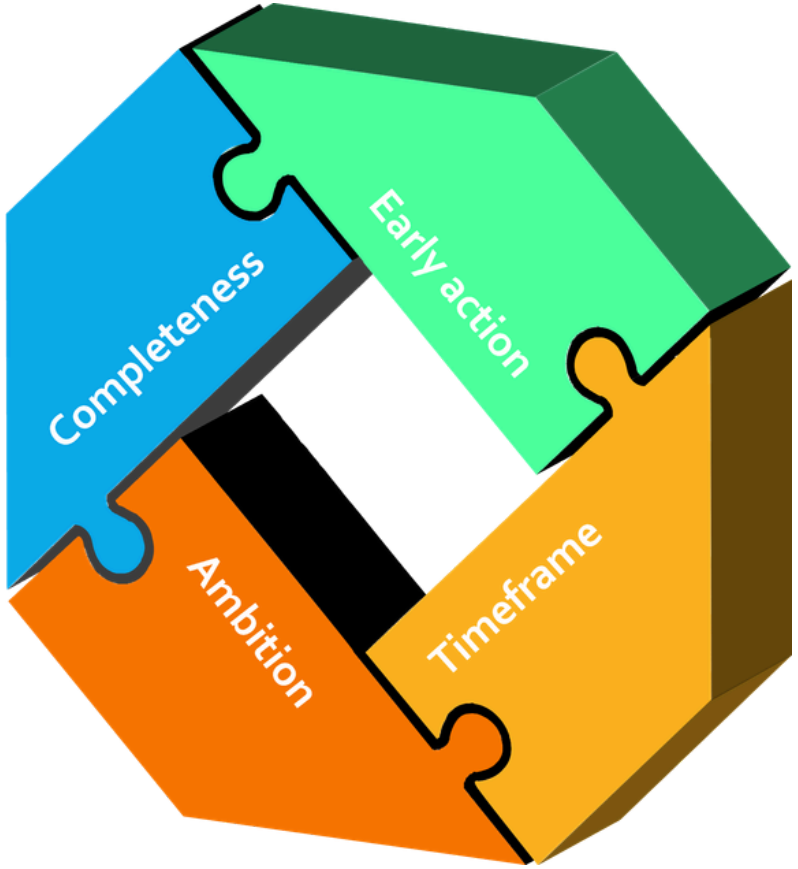
Science-based targets ensure that we are on the right path towards reducing our greenhouse gas emissions, in line with the goals of the Paris Agreement. Though the Science-Based Target Initiative does not validate targets for institutions of higher learning, we have incorporated relevant principles into our decarbonisation roadmap.

1. Our targets cover all aspects of our daily operations as a university, with consideration given towards Scope 1, Scope 2, and Scope 3 emissions

2. We are setting out short-term goals, in addition to overarching 2030 greenhouse gases reduction target

3. Our 2030 timeframe allows for an addition 20 years (to 2050) to achieve carbon neutrality.

4. Mitigation targets that take into account the 1.5 degrees Celsius warming limit



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Decarbonisation Success Stories

Decarbonisation Success Stories

We are following in the footsteps of those who have started their decarbonisation journey ahead of us. Here are some of their success stories, and what we have learned from their journeys.

Carbon neutral in 2016

UTAS' strategy utilises a holistic approach to the decarbonisation challenge. Sustainability principles and practices are imbued in every aspect of UTAS' operations. They are also active in contributing to climate action measures in their region by exemplifying an institution-wide commitment to reduce environmental impacts, achieve economic efficiency, demonstrate social responsibility, and enhance student experience. In addition, UTAS has formed many connections with their local and federal governments and associated agencies through research activities in agriculture, sustainability and environmental science, as well as climate and ocean science.

Carbon neutral in 2019

The ambitious and visionary thinking of ASU's Sustainability Leadership Team allowed them to go above and beyond their carbon neutrality target. As the team accelerated the timeline for achieving carbon neutrality, ASU was successful in achieving net zero for their Scope 1 and Scope 2 emissions in 2019, six years earlier than their previously proposed timeline of completion. Their next target is to achieve carbon neutrality for Scope 3 emissions by 2035, of which they have already reduced by 69% since their baseline year of 2007.

Carbon neutral in 2020

Energy efficiency and renewable energy were the two main thrusts of LSE's decarbonisation strategy. By investing £4.8 million investment since 2015 into energy efficiency measures, they were able to upgrade Building Management Systems, install LED lights and advanced lighting controls, fit solar panels, insulate pipes, and replace boilers and chillers. Moreover, LSE is 100% powered by renewable energy, enabling them to achieve their carbon neutral target.

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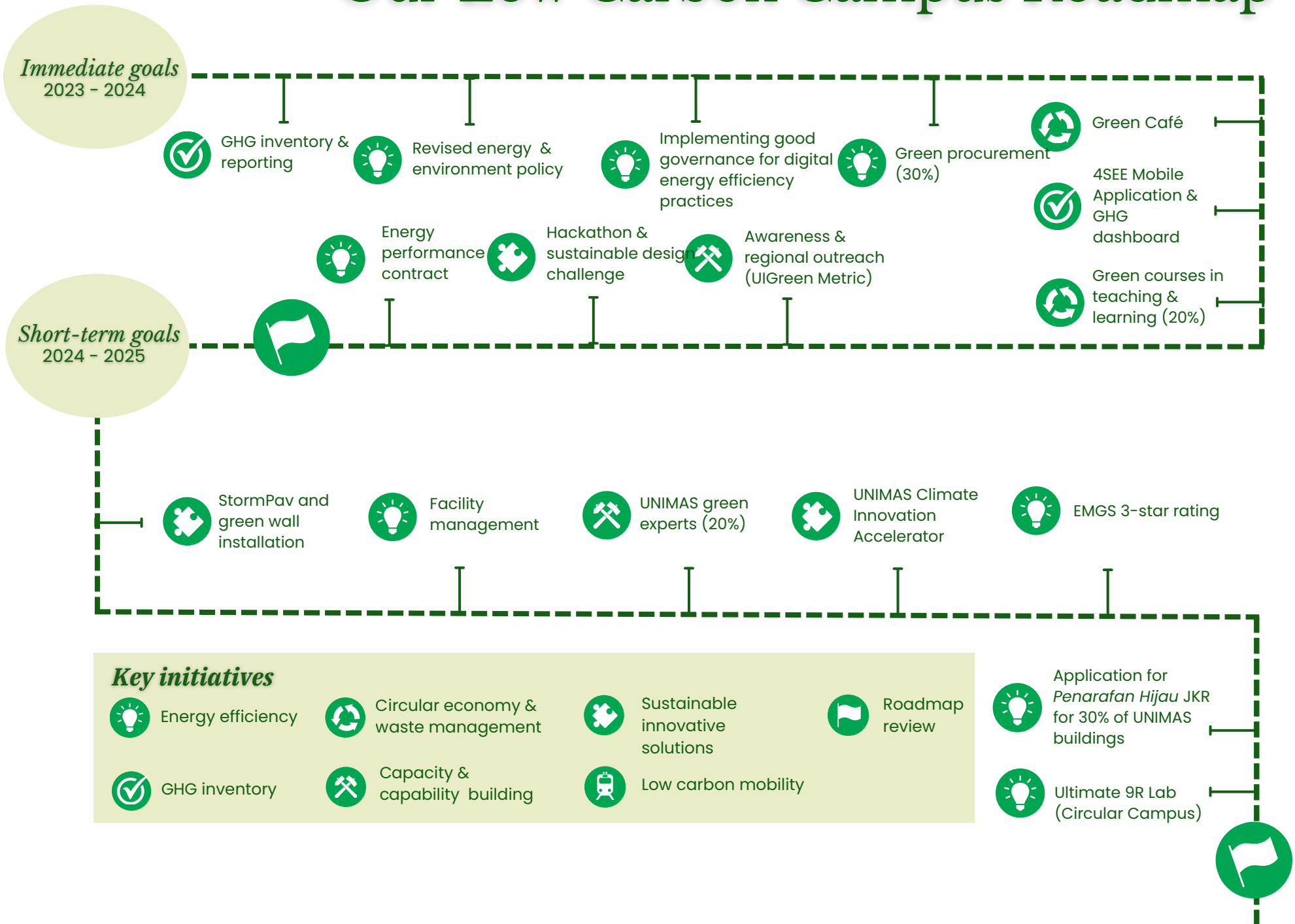
Our Low Carbon Campus Roadmap

Our Low Carbon Campus Roadmap



Long-term goals
2025 - 2030

UNIMAS Integrated Waste Management Centre

Nature-based solutions

Digitalising & electrifying UNIMAS transport fleet

Conserving our campus sinks

UNIMAS carpool & feeder bus scheme

Our Targets for 2030

- 30% energy consumption reduction and increase in renewable energy share from **2022**
- 45% greenhouse gases reduction from **2022**
- 40% waste minimisation from **2022**
- 20% increase in staff and students specialising in sustainability and green technology from **2022**

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6 Strategic Pillars

6 Strategic Pillars

Energy efficiency

To be energy efficient, our systems and infrastructure need to use less energy while maintaining the same or greater productivity. Energy efficiency is the integral first step to reducing greenhouse gas emissions, as it is often one of the more manageable and cost-effective ways to make an organization more climate-friendly. Thus, we regard increasing energy efficiency as our first strategic pillar.

Greenhouse gases (GHG) inventory

A greenhouse gas inventory accounts for the sources of emissions an organization makes. We believe a GHG inventory is another crucial step towards our decarbonisation goals, as it allows us to develop a baseline, identify reduction opportunities, and monitor our progress.

Circular economy & waste management

A circular economy emphasises sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products in the production and consumption cycle. In a circular economy, the materials used to manufacture a product are kept within the economy even after the product's use, reducing waste and increasing the productivity of the materials. That is why the implementation of a circular economy best practice is included in our roadmap, as it not only reduces excessive consumption, but has the potential to generate wealth from what was once considered waste.

Capacity & capability building

Capacity building is one of the main businesses of a university, and it's a business we take extremely seriously. We aim to produce graduates and experts that are ready to help our local communities transition to a green economy. We also want to increase our capacity to implement our decarbonisation goals by providing opportunities for certification and learning in areas related to sustainable development and carbon-neutral growth.

Sustainable innovative solutions

We want to foster an environment that encourages innovative research and design centred on sustainability. We aim to provide members of our campus and surrounding communities opportunities to participate in creating solutions for crises related to climate change and environmental degradation.

Low Carbon Mobility

Transport remains one of the biggest contributors to global warming, accounting for nearly 10% of global GHG emissions. Empowering our campus community to take low carbon transport options will reduce our campus' climate impact in this aspect. In addition, we will also introduce carbon neutral alternatives to our transport facilities.

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Aligning SDGs with Our Roadmap

Aligning SDGs with Our Roadmap

The Sustainable Development Goals are a shared blueprint for peace and prosperity for people and the planet, including UNIMAS. While this low-carbon campus roadmap focuses on six SDGs (enlarged on the SDG wheel), these SDGs are interconnected with fifteen others. Increasing our access to affordable and clean energy, building sustainable cities and communities, encouraging responsible consumption and production, facilitating climate action, and taking care of our life on land will lead to benefits in other SDGs.



Aligning SDGs with Our Roadmap

In all our strategies, we acknowledge the need for SDG 17: Partnership for the Goals.

Sustainable Development Goal	7	11	12	13	15
STRATEGIC PILLAR 1: Energy efficiency					
Revised energy & environment policy	✓	✓		✓	✓
Energy performance contract	✓				
Facility management	✓	✓			
EMGS 3-star rating	✓				
Application for *Penarafan Hijau JKR* for 30% of UNIMAS buildings	✓	✓			
Green procurement	✓		✓		
Implementing good governance for digital energy efficiency practices	✓				
STRATEGIC PILLAR 2: GHG inventory					
4SEE Mobile Application & GHG dashboard		✓	✓	✓	
GHG inventory & reporting				✓	
Conserving our campus carbon sinks				✓	✓
STRATEGIC PILLAR 3: Circular economy & waste management					
Green courses in teaching & learning			✓	✓	
Integrated Waste Management Centre		✓	✓		



Green Café			✓		
Ultimate 9R Lab		✓	✓		

STRATEGIC PILLAR 4: Capacity & capability building

Awareness & regional outreach		✓			
UNIMAS green experts (20%)	✓	✓	✓	✓	

STRATEGIC PILLAR 5: Sustainable innovative solutions

Hackathon & sustainable design challenge		✓	✓	✓	
UNIMAS Climate Innovation Accelerator	✓			✓	✓
StormPav and green walls installation		✓		✓	
Nature-based solutions		✓		✓	✓

STRATEGIC PILLAR 6: Low carbon mobility

UNIMAS carpool & feeder bus scheme		✓		✓	
Digitalisation and electrification of UNIMAS transport fleet					



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Glossary

Glossary

BJKA	Academic Quality Assurance Division
Business-as-usual	A future scenario where there is no significant change in the attitudes, priorities, and goals. It also refers to a scenario where there are no new developments in technology, economics, and policies.
CALM	Centre for Applied Learning and Multimedia
Carbon footprint	The total amount of greenhouse gases that are generated by our activities.
Carbon neutrality	Having a balance between emitting and absorbing the carbon from the atmosphere.
CITDS	Centre for IT Development and Services
Climate impact	The impact of an organisation on global climate, as measured through the organisation's carbon emissions. See *carbon footprint*.
Decarbonisation	The process of reducing the amount of carbon emitted into the atmosphere.
Digital economy	An economy in which digital computing technologies power economic activities.
Ecoregions	Large regions of land or water containing similar ecosystems.
ESG	Environmental, social, and corporate governance
Green economy	A low carbon economy that is both resource efficient and socially inclusive.
Green growth	Economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies.
Greenhouse gases	Gases that trap heat in Earth's atmosphere, resulting in the greenhouse effect. This effect results in global warming. These gases are the main contributors to global warming: carbon dioxide, methane, nitrous oxide, and water vapour.
GBI	Green Building Index
GRI	Global Reporting Initiative
HEPA	Student and Alumni Affairs

HR	Human Resources Management Division
IBEC	Institute of Biodiversity and Environmental Conservation
IP	Intellectual property
ISuRE	Institute of Sustainable and Renewable Energy
Low carbon	Low levels of greenhouse gas emissions.
Low carbon transition	See *decarbonisation*.
Nationally Determined Contributions	A climate action plan to cut emissions and adapt to climate impacts, a requirement of the Paris Agreement.
Nature-based solutions	Actions to protect, sustainably manage, or restore natural ecosystems, that address climate change.
PPP	Centre for Student Development
RIEC	Research, Innovation and Enterprise Centre
SQRC	Strategic Planning, Quality and Risk Management Centre
Sustainable Development Goals (SDGs)	A shared blueprint for peace and prosperity for people and the planet, now and into the future. There are 17 SDGs in total.
UHSB	UNIMAS Holdings Sdn Bhd
ULC	UNIMAS Leadership Center
USC	University Sustainability Centre
UWC	UNIMAS Water Center

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UNIMAS Faculties, Research Institutes and Research centres

UNIMAS Faculties

Resource Science and Technology
Social Sciences and Humanities
Cognitive Sciences and Human Development
Applied and Creative Arts
Engineering
Computer Science and Information Technology
Medicine and Health Sciences
Economics and Business
Language and Communication
Built Environment
Centre for Pre-University Studies
UNIMAS Business School

UNIMAS Research Institutes

Biodiversity and Environmental Conversation
Health and Community Medicine
Borneo Studies
Creative Arts and Technology
Social Informatics and Technological Innovations
Sustainable and Renewable Energy
Tourism and Research Innovations

UNIMAS Research Centres

Malaria Research
Sago Research
Financial Technology and Innovation
Spatially Integrated Digital Humanities
Social Innovation
UNIMAS Water Center
Human Resilience and Potential Centre
Data Science
Centre for Construction on Peat and Problematic Soil

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Our Expertise

Our Expertise



Professor Ts. Dr Shanti Faridah Salleh

Environmental sustainability
Green technology



Professor Ir. Ts. Dr Al-Khalid bin Hj Othman

Power systems
Communication systems



Dr. Florianna Lendai anak Michael Mulok

Sustainability indexing
Sustainable urban environments



Professor Ar. NurAkmal A. Goh

Sustainable urban planning
Urban biodiversity



Ts. Dr. Yonis M. Yonis Buswig

Power systems
Renewable energy



Dr. Nurliyana binti Abdul Raof

Biobased Material Development
Green Materials



Mr Mohd Farid Atan

Wastewater treatment
Renewable energy



Dr. Nur Tahirah Razali

Renewable energy
Green materials



Ir. Dr. Muhammad Syukri Imran bin Abdullah

Energy efficiency
Green building



Dr. Lidyana binti Roslan

GHG Emission Management
Carbon Sequestration
Technology



Dr. Marzie Hatef Jalil

Eco-fashion
Sustainable textile design



Professor Dr. Azhaili Bin Baharun

Renewable energy
Green building