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Engage**SDG**

OBREAL

SARUA



# Community Carbon Footprint Initiative

*PROMOTING PARTICIPATORY CLIMATE  
ACTION*

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# 01

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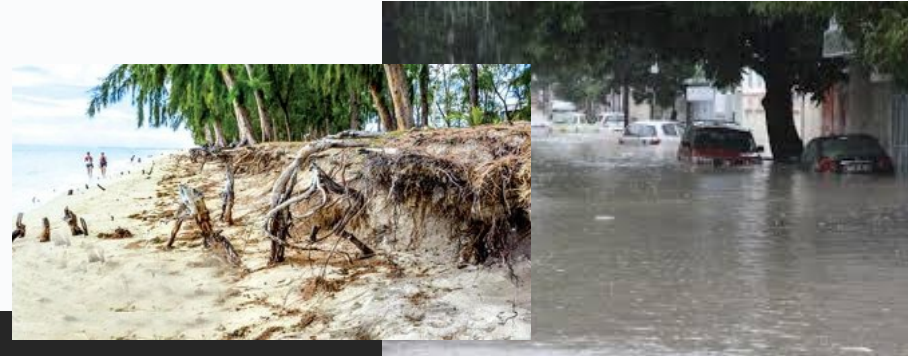
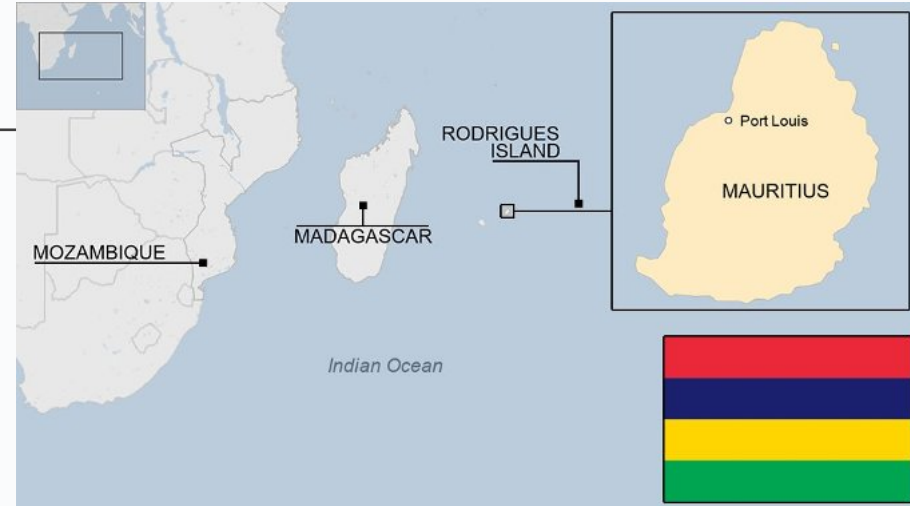
## UTM Context

*Why this project, why now, why Mauritius*

# The Country context

## Mauritius: A SIDS Context

- Small Island Developing State — high environmental vulnerability
- Rising sea levels, intensified cyclones, coastal erosion
- Coal-heavy electricity grid (0.65 kgCO<sub>2</sub>e/kWh)
- National NDC commits to emission reductions by 2030
- Higher education critical to translating policy into behaviour
- UTM: one of five public HEIs in Mauritius



# The Challenge We Are Addressing

Despite national and institutional commitments to sustainability, translating environmental responsibility into daily behaviour remains a critical gap.

## Top-down approaches

Traditional policy-driven sustainability efforts generate limited buy-in and fragmented action among local communities

## Limited personal accountability

Community members lack tools and awareness to understand their own carbon footprint or its link to climate change

## Missing participatory model

No existing mechanism for co-producing sustainability knowledge or empowering grassroots environmental reflection

## Institutional inertia

Sustainability seen as governmental and administrative responsibility, not a shared personal and collective practice

Universities must be part of the answer.

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*What if our university campus could become  
a living laboratory for climate action*

# 02

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## Project Design

*Objectives, methodology and implementation timeline*

# Project Objectives

Overall: Operationalize participatory approaches to climate action by embedding sustainability awareness and behavioural reflection within the UTM community as a contribution to SDG 13.

**SDG 11**  
Sustainable Cities

**SDG 12**  
Responsible Consumption

**SDG 13**  
Climate Action

**SDG 17**  
Partnerships

## Baseline Carbon Audit

Conduct participatory carbon footprint baseline assessment of UTM campus

## Awareness & Capacity Building

Train at least 50 students and staff in carbon literacy through workshops

## Behavioural Change Campaign

Launch "Green Pulse" campaign reaching at least 70% of campus community

## Participatory Monitoring

Establish student-staff "Green Stewards" monitoring team with dashboard tools

## Model Replication

Document and share a participatory campus sustainability model for other institutions

# Methodology: Community-Based PAR + Crowdsourcing

*Two complementary participatory approaches chosen from the Integrated Participatory Framework (IPF):*

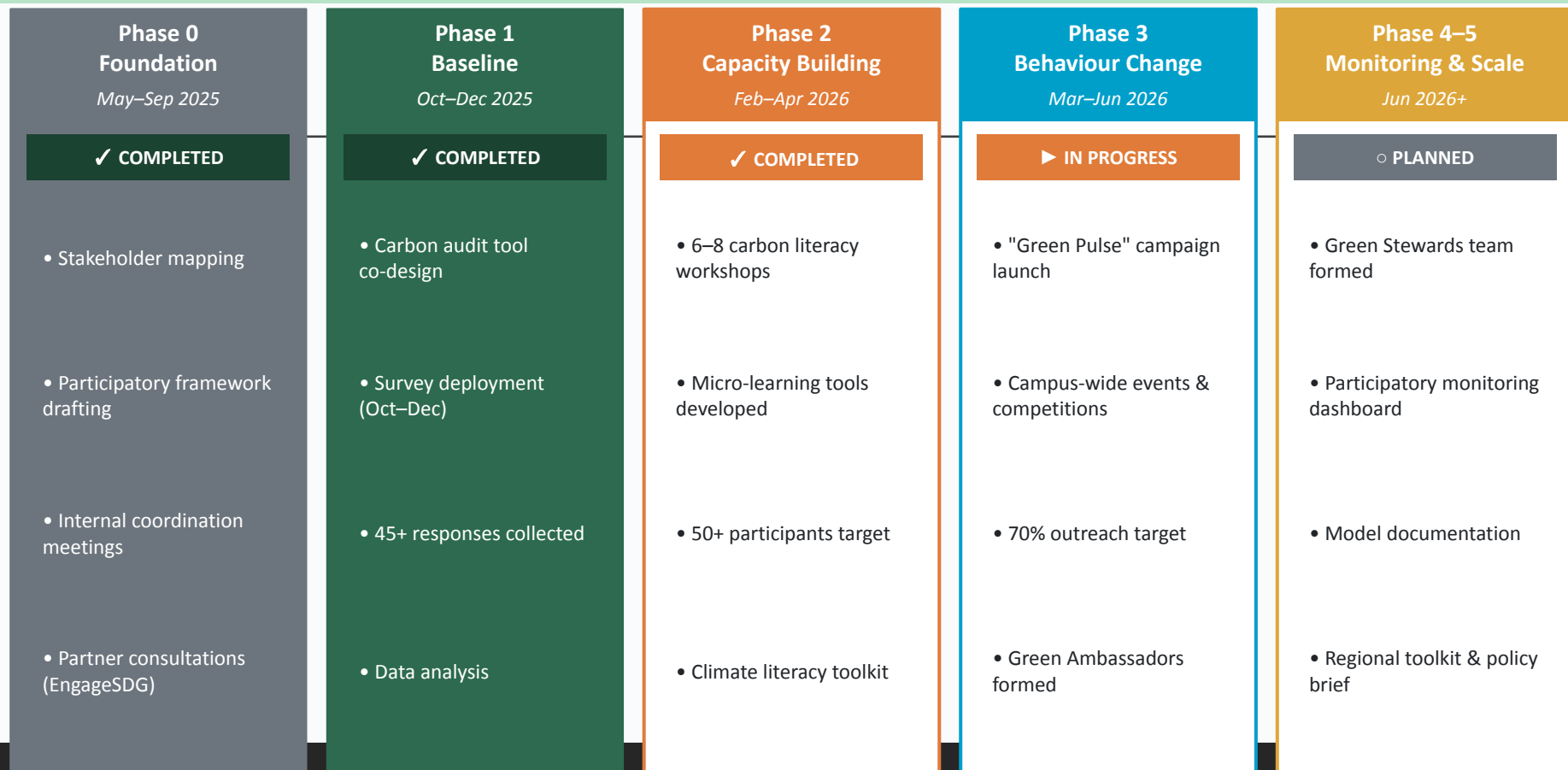
## Community-Based PAR (CBPAR)

- Participatory workshops & focus groups (10–15 members, monthly 2-hr sessions)
- Action-learning cycles: Plan → Act → Observe → Reflect (iterative, 4-month cycles)
- Carbon footprint assessments co-conducted with community members
- Peer-to-peer learning: students and staff cascade knowledge across UTM
- Participatory monitoring and evaluation (PM&E) embedded throughout
- Empowerment-based framing — sustainability as shared learning, not blame

## Crowdsourcing Method

- Carbon footprint toolkit deployed as structured questionnaire to all UTM stakeholders
- Voluntary, open participation — students, staff, researchers, administrators
- Self-assessment using OCE Carbon Footprint Calculator (38 questions, 10 sectors)
- Data contributed by community = community-owned evidence base
- Anonymous data collection with ethical safeguards (verbal/implied consent)
- Baseline dataset informs all subsequent interventions

# Implementation Timeline (June 2025 – June 2026)



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## Phase 0–1 Implementation

*What we built, how we deployed it, what we delivered*

# What We Delivered: Phase 0 & Phase 1

## Internal Coordination

- Multiple team meetings
- Consultations with EngageSDG partners
- Methodology aligned with Integrated Participatory Framework
- Contextual adaptation to Mauritian higher education environment

## Carbon Footprint Toolkit

- Designed a structured 38-question survey questionnaire
- Based on validated OCE Carbon Footprint Calculator
- Covers 10 emission sectors across daily life
- Adapted to Africa/Mauritius context (energy mix, transport, agriculture)

## Baseline Data Collection

- Survey deployed Oct–Dec 2025 to UTM stakeholders
- Voluntary participation, anonymous, with ethical safeguards
- 45+ respondents: students, staff, researchers, administrators
- First-ever individual carbon footprint dataset at UTM

## Communication & Outreach

- Project awareness flyer produced (purpose, SDG links)
- Presentations to institutional stakeholders
- EngageSDG partner consultations maintained
- Data analysis completed

# The Carbon Footprint Toolkit: Design Principles

## Survey Design Principles

- Based on OCE Carbon Footprint Calculator (IPCC-backed, IRD, Météo France, PIK)
- 38 questions covering all major emission sectors of daily life
- Intentionally simplified — accessible to all educational levels
- Voluntary and anonymous — ethical safeguards applied
- Educational as well as diagnostic — prompts reflection while collecting data
- Framed positively: "understand your footprint" not "prove your emissions"
- Served dual purpose: data collection + awareness raising

## 10 Emission Sectors Covered

- |    |                               |                                                      |
|----|-------------------------------|------------------------------------------------------|
| 1  | <b>Home Appliances</b>        | <i>Lifecycle + energy use of all devices owned</i>   |
| 2  | <b>Lighting &amp; Standby</b> | <i>Habits around switching off and standby power</i> |
| 3  | <b>Cooling</b>                | <i>A/C vs fans vs natural ventilation choices</i>    |
| 4  | <b>Water Usage</b>            | <i>Tap habits and toilet flush type</i>              |
| 5  | <b>Transport</b>              | <i>Commute and leisure travel modes</i>              |
| 6  | <b>Food &amp; Diet</b>        | <i>Meat, dairy, fish, organic, waste, beverages</i>  |
| 7  | <b>Clothing</b>               | <i>New vs second-hand, local vs imported</i>         |
| 8  | <b>Shopping &amp; Waste</b>   | <i>Bags, packaging, sorting, recycling</i>           |
| 9  | <b>Technology</b>             | <i>Mobile data, streaming, electronics lifecycle</i> |
| 10 | <b>Infrastructure</b>         | <i>Fixed baseline for Mauritius energy grid</i>      |

# 04

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## Baseline Survey Findings

*Carbon footprint data from 45 UTM community members*

# Headline Results: Carbon Footprint Summary

6,119

kgCO<sub>2</sub>e/year  
UTM Survey Mean

3,100

kgCO<sub>2</sub>e/year  
Mauritius Est. Average

4,667

kgCO<sub>2</sub>e/year  
Global Average (IEA 2022)

2,000

kgCO<sub>2</sub>e/year  
IPCC 1.5°C Target (2030)

Individual footprints ranged from 2,572 to 9,185 kgCO<sub>2</sub>e/year — median 6,286 — all 45 respondents exceed the 1.5°C target

3

respondents  
7% of total

**Low Risk**  
< 3,500 kgCO<sub>2</sub>e

16

respondents  
36% of total

**Medium Risk**  
3,500–6,000

19

respondents  
42% of total

**High Risk**  
6,000–8,000

7

respondents  
16% of total

**Very High Risk**  
> 8,000 kgCO<sub>2</sub>e

# How UTM Compares: Global Benchmarks

*UTM Survey Mean vs. national and international reference points (kgCO<sub>2</sub>e/year):*

UTM Survey Mean



6,119

*This study — all 45 respondents*

Mauritius Est. Average



3,100

*Coal-heavy grid; ~97% below UTM mean*

Global Average (IEA)



4,667

*World Bank / IEA 2022 per capita*

Africa Sub-Saharan Avg



1,500

*Low-income economies; lower energy use*

IPCC 1.5°C Target

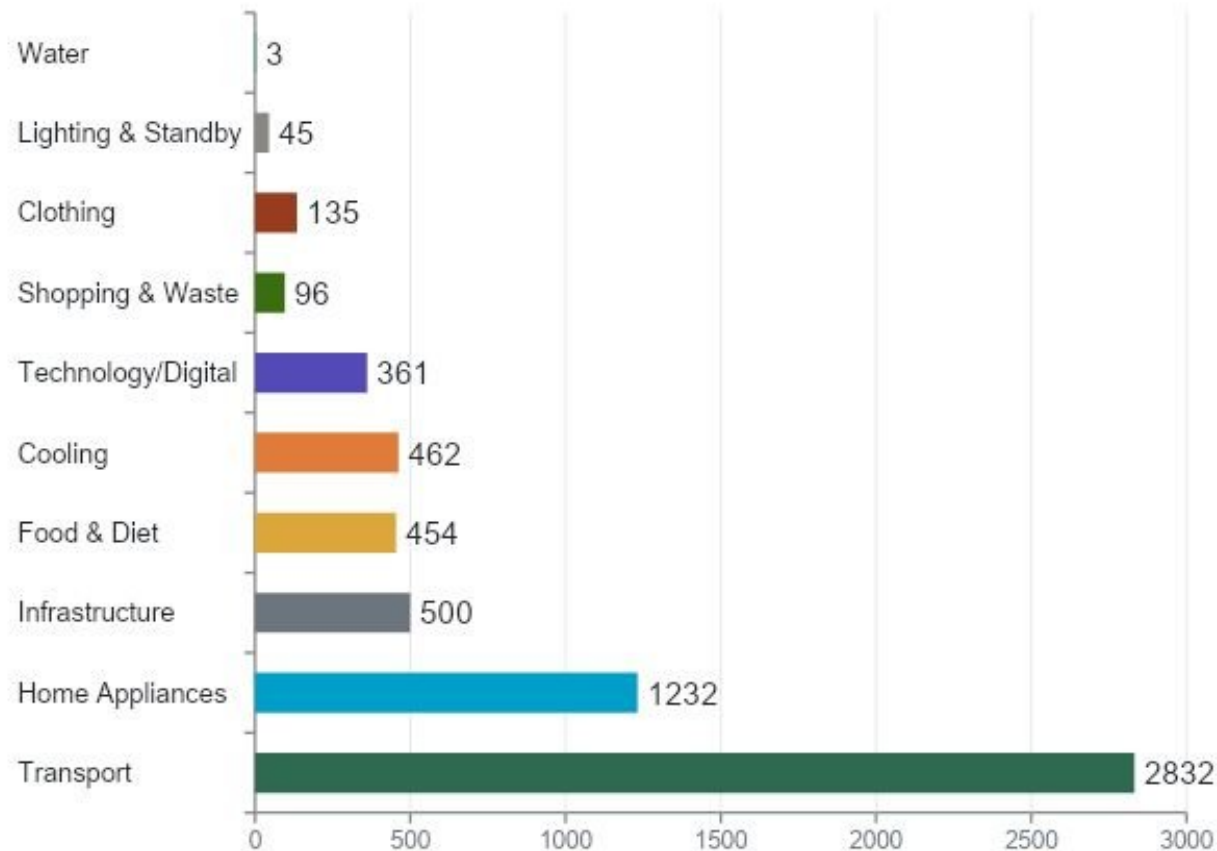


2,000

*Science-based sustainable limit by 2030*

UTM mean is +97% above the Mauritius average · +31% above global average · +206% above the 1.5°C climate target

# Carbon Footprint by Emission Sector



**46.3%**

Transport — largest driver

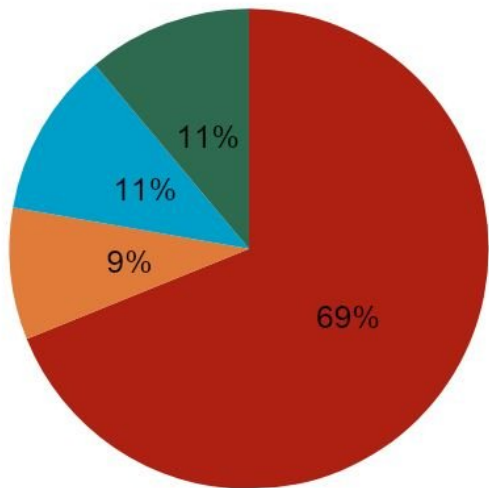
**20.1%**

Home Appliances

**33.6%**

All remaining sectors

# Transport: The Single Largest Driver



■ Car (solo)  
■ Carpooling  
■ Bus  
■ Active (walk/cycle/scooter)

## Annual commute carbon cost by transport mode:

### Solo car

**~3,591 kgCO<sub>2</sub>e/yr**

*31 respondents (69%) — highest emission mode*

### Carpooling

**~924 kgCO<sub>2</sub>e/yr**

*4 respondents — 74% lower than solo car*

### Bus

**~1,056–2,376/yr**

*5 respondents — distance-dependent*

### Walk/Cycle

**~0 kgCO<sub>2</sub>e/yr**

Key takeaway: Shifting from solo car to carpooling saves up to 2,667 kgCO<sub>2</sub>e/year per person — the single highest-impact individual action available.

# Food, Cooling & Home Appliances

## Food & Diet — 454 kgCO<sub>2</sub>e avg

- Relatively low red meat consumption — positive finding for a tropical SIDS
- 20 respondents consume dairy daily (meaningful emission source)
- 58% eat organic food → lowers food footprint by ~30%
- 17 respondents drink bottled water (+118 kgCO<sub>2</sub>e/yr each)
- Food waste generally well managed — 17 waste nothing
- Fish and seafood widely consumed (sustainable local option)

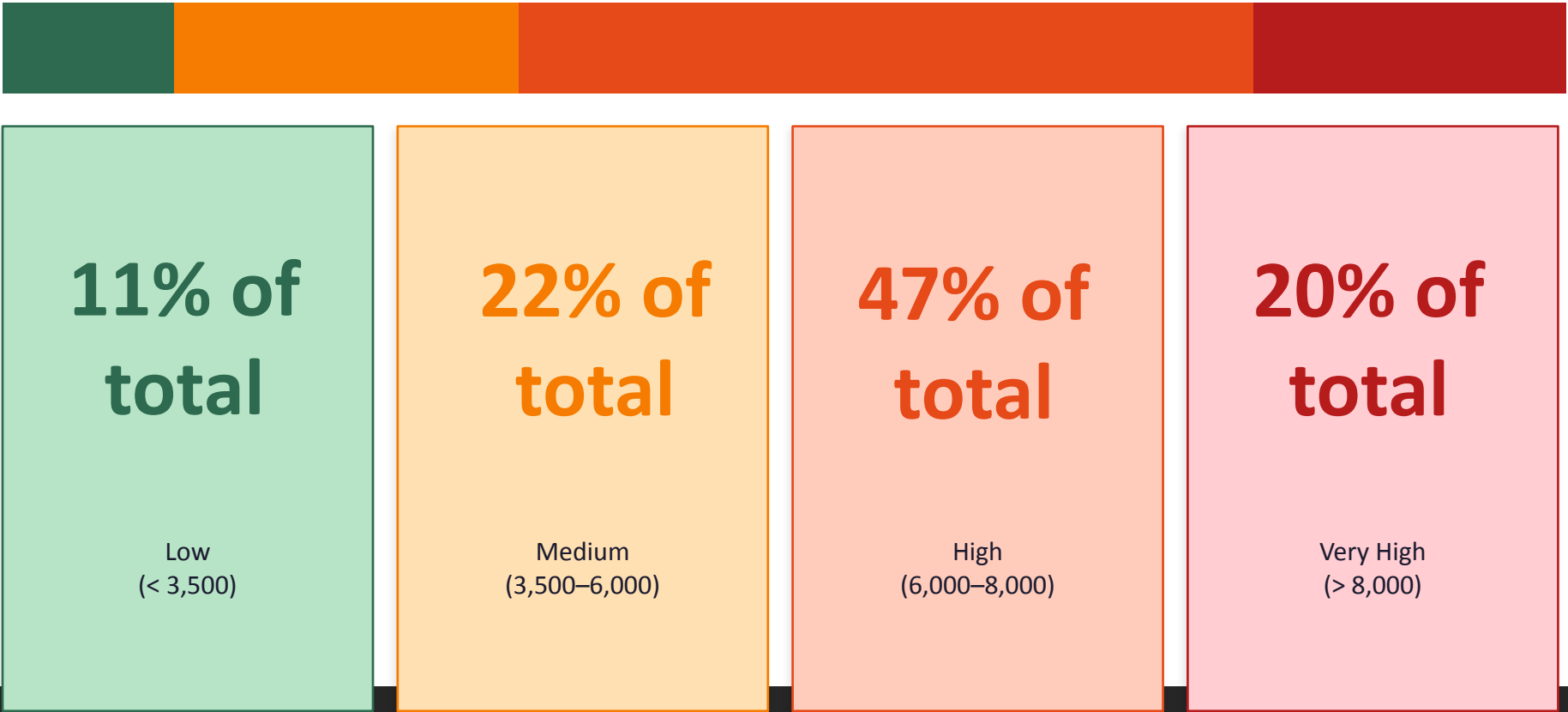
## Cooling — 462 kgCO<sub>2</sub>e avg

- 16 respondents (36%) use A/C for 4–6 months → ~1,950 kgCO<sub>2</sub>e each
- 16 use electric fans (moderate: ~150–300 kgCO<sub>2</sub>e/yr)
- 13 rely on natural ventilation → near-zero cooling emissions
- Gap between A/C and ventilation: ~1,950 kgCO<sub>2</sub>e/yr
- Mauritius's tropical climate makes this a persistent challenge
- Behavioural & architectural solutions both needed

## Home Appliances — 1,232 kgCO<sub>2</sub>e avg

- Average 1,232 kgCO<sub>2</sub>e — second-largest sector
- All respondents own TV and washing machine; most own laptops
- Clothes dryers add ~520 kgCO<sub>2</sub>e/yr (8 respondents own one)
- 71% switch appliances fully off at night — positive habit
- 12 leave appliances on standby (+26 kWh/appliance/yr each)
- Lifecycle + energy use both counted in calculations

# Risk Level Distribution — 45 Respondents



# Two Sides of the Picture

## What the community already does well

|     |                                       |
|-----|---------------------------------------|
| 93% | turn off the tap while brushing teeth |
| 84% | switch off lights when leaving a room |
| 71% | switch appliances fully off overnight |
| 71% | use both sides of paper sheets        |
| 58% | eat organic food                      |
| 51% | sort household waste at home          |
| 44% | always bring reusable shopping bags   |
| 38% | use non-car transport to campus       |

## The awareness & behaviour gap

|     |                                                                                                                                      |
|-----|--------------------------------------------------------------------------------------------------------------------------------------|
| 69% | commute by solo private car — largest single driver                                                                                  |
| 36% | use air conditioning for 4–6 months per year                                                                                         |
| 38% | buy new clothes from overseas (high transport cost)                                                                                  |
| 49% | do not sort household waste at home                                                                                                  |
| 20% | leave appliances on standby overnight                                                                                                |
| 93% | identified climate change correctly in survey — but disconnect between knowledge and personal accountability remains the key finding |

# What the Community Is Already Doing Well

*Despite high footprints, many positive sustainability behaviours were observed:*

**93%**

turn off the tap while brushing teeth

**84%**

switch off lights when leaving a room

**71%**

turn electrical appliances off fully overnight

**71%**

use both sides of paper sheets

**58%**

eat organic food (reduces food footprint  
~30%)

**56%**

compost food scraps at home

**44%**

bring reusable bags shopping always or  
most of the time

**38%**

travel to campus by carpool, bus, or active  
transport

**76%**

replace electronics only every 2–3 years or  
longer

# 05

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## Challenges & Lessons Learned

*Honest reflections from the implementation phase*

# Challenges Encountered

## Participation Hesitancy

Initial reluctance to share carbon-related behavioural data when the purpose of the measurement was not fully understood by participants

### Mitigation:

Awareness and trust-building must precede data collection — not follow it

## Academic Calendar Constraints

Students' hectic semester schedule (ending July 2025) and adverse weather conditions limited availability and uptake during early deployment

### Mitigation:

Flexible, phased planning and hybrid engagement models are essential for island contexts

## Funding Constraints

Current EngageSDG budget allocation is projected to be insufficient to cover all planned activities, including the full behavioural change campaign and monitoring system

### Mitigation:

Seeking supplementary institutional funding and in-kind contributions; student volunteer integration

## Scale of Participation

Final sample of 45 respondents is meaningful for baseline purposes but below the 100+ stakeholder target set in Phase 0. Campus-wide engagement requires stronger institutional buy-in mechanisms

### Mitigation:

Embedding future surveys in academic modules and student societies; certificates of participation offered

# Key Lessons learnt

*Insights from UTM's implementation that may strengthen partner approaches across the network:*

01

## **Trust before data:**

Participants share information more freely when they understand the purpose and non-evaluative nature of the exercise. Awareness sessions should precede survey deployment.

02

## **Empower, don't shame:**

Empowerment-based framing ("understand your footprint to change it") works better than accountability-based messaging. Guilt-driven campaigns may reduce engagement.

03

## **Calendar sensitivity matters:**

Island contexts have concentrated academic calendars, weather disruptions and community rhythms. Flexible, hybrid designs (online + in-person) are essential.

04

## **Sequence the interventions:**

The project revised its strategy to ensure awareness → reflection → data collection → behavioural change, rather than starting with broad data gathering before building understanding.

05

## **Institutional leadership unlocks participation:**

Strong interest from university leadership was a key enabler. Formal embedding in modules, student societies and institutional planning will drive long-term uptake.

# 06

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## Next Phase & Recommendations

# Phase 2 & 3: What Happens Next

*The baseline findings now become the evidence base for targeted participatory interventions:*

## Phase 2

### Carbon Literacy Workshops

- 6–8 workshops for students and staff on carbon literacy and sustainable practices
- Target: 50+ trained participants
- Micro-learning tools developed (short online modules, infographics)
- Climate literacy toolkit published and shared with EngageSDG network
- Peer-to-peer learning cascaded across UTM departments

## Phase 3

### "Green Pulse" Behaviour Change Campaign

- Campus-wide awareness campaign using baseline data as conversation starter
- Events, competitions, visual branding — making sustainability visible on campus
- Baseline findings presented at community events (this is happening now)
- 70% campus outreach target
- Green Student Ambassadors network formed

## Ongoing

### Monitoring & Partnerships

- Participatory monitoring team ("Green Stewards") established
- Progress dashboard developed to track key behavioural indicators
- Second carbon footprint survey planned to measure change post-intervention
- Model documentation for replication across SADC and EngageSDG network
- Policy brief and regional dissemination event

# Priority Recommendations for UTM

Section 06

*Ordered by emission reduction potential — based entirely on the baseline evidence:*

1

## Transport

Up to **-2,667**  
kgCO<sub>2</sub>e/person/yr

Institution: Formal carpooling scheme; subsidised bus passes (NTA partnership); secure cycling infrastructure on campus

Individual: Switch from solo car to carpooling, bus, or active transport for campus commute

2

## Cooling

Up to **-1,950**  
kgCO<sub>2</sub>e/person/yr

Institution: "Cool Without A/C" campaign; explore architectural passive cooling in campus buildings

Individual: Use electric fans or natural ventilation; reserve A/C for extreme heat days only

3

## Home Appliances & Energy

Up to **-500**  
kgCO<sub>2</sub>e/person/yr

Institution: Energy-star appliance awareness; standby power audit tools; campus renewable energy roadmap

Individual: Switch off fully at night; avoid dryers where possible; upgrade inefficient appliances

4

Food & Diet: Canteen plant-forward menus; filtered tap water dispensers; label meal footprints; reduce bottled water on campus

5

Waste & Recycling: Comprehensive campus sorting bins; composting facility; "Sort It" awareness campaign targeting the 49% who don't sort

6

Digital & Consumption: Extend device lifespans; repair café on campus; second-hand clothing exchange; mindful mobile data use

# The Path Forward

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1. The baseline data is in. For the first time, UTM has evidence-based, quantified knowledge of its community's carbon footprint — and the leverage points for change are clear.
2. Transport change alone could cut the community's average footprint by up to 44%. The tools and the will are there.
3. The participatory approach is working: trust is being built, awareness is growing, and the community is ready for Phase 2.
4. The EngageSDG network gives us something no single institution has alone: the ability to compare, learn and scale across Africa and Europe.

University of Technology, Mauritius | EngageSDG SADC Pilot Project | May 2026

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