



PROJECT PROPOSAL

I. PROJECT IDENTIFICATION:

- 1.1. **Project Title: EcoTech: Smart Waste Management and Energy Monitoring System**
- 1.2. **Project Location: City College of Calapan**
- 1.3. **Project Proponent: BSIS Department**
- 1.4. **Date of Implementation: April - September 2025**
- 1.5. **Project Cost: ₱ 73,500**
- 1.6. **Source of Fund: BSIS Department**

II. PROJECT DESCRIPTION:

With the rise of environmental challenges and the advancement of modern technology, the **Bachelor of Science in Information Systems (BSIS) Department** aims to address sustainability issues by integrating technology-driven solutions. **EcoTech** is an innovative initiative designed to promote environmental sustainability within City College of Calapan (CCC). The project focuses on *QR code waste sorting*, *smart energy monitoring*, and a *digital EcoPoints reward system* to encourage students to adopt ecofriendly habits. By leveraging accessible technologies such as QR codes, IoT-based energy monitors, and Google automation tools, EcoTech provides a scalable and impactful approach to tackling sustainability challenges on campus.

This initiative aligns with the 10 Centers of Youth Participation, particularly in **Environmental Protection and Disaster Risk Reduction (EP-DRR)** and **Science, Technology, and Innovation (STI)**. Through structured waste management and energy conservation efforts, EcoTech fosters a culture of environmental responsibility among students. The QR code waste sorting system ensures proper disposal and recycling, while the smart energy monitoring system tracks and optimizes electricity consumption, helping reduce the campus's carbon footprint.

To further engage students, the **EcoPoints reward system** gamifies sustainability by incentivizing participation. Students earn EcoPoints by correctly sorting waste, reducing energy usage, and participating in eco-friendly initiatives. These points can be redeemed for school supplies, discounts on campus services, or recognition in sustainability programs. By combining technology, education, and incentives, EcoTech transforms sustainability into an interactive and rewarding experience, encouraging longterm behavioral change and fostering a greener campus community.



III. OBJECTIVES:

The EcoTech project aims to integrate technology-driven solutions for sustainability at **City College of Calapan (CCC)** by enhancing waste management and energy conservation. The objectives are as follows:

- Implement a QR code-based waste sorting system and a smart energy monitoring system to improve waste management practices and optimize energy consumption on campus.
- Achieve a 30% reduction in improper waste disposal and a 20% decrease in classroom energy wastage within the first semester of implementation.
- Leverage readily available technologies such as QR codes, Google Sheets, and smart plugs to ensure accessibility and ease of adoption for students and faculty.
- Support Calapan City's green initiatives and align with the 10 Centers of Youth Participation, particularly in Environmental Protection and Disaster Risk Reduction (EP-DRR) and Science, Technology, and Innovation (STI).
- Execute full implementation within 10 weeks, starting with a 5-week pilot phase, followed by a full campus rollout by the 8th week to ensure smooth adaptation and effectiveness.

IV. DEFINITION OF NEEDS:

City College of Calapan (CCC) faces challenges in waste management, excessive energy consumption, and low student participation in sustainability efforts. Improper waste disposal contributes to environmental pollution, while inefficient energy use leads to unnecessary resource depletion. Additionally, the lack of engagement in eco-friendly initiatives limits the campus community's collective impact on sustainability.

EcoTech addresses these concerns by implementing a technology-driven waste segregation and energy monitoring system, encouraging students and faculty to adopt responsible environmental practices. By integrating QR code-based waste sorting, smart energy tracking, and an incentive-driven EcoPoints system, the project promotes sustainable behavior, reduces environmental footprint, and enhances campus-wide awareness of green initiatives.

V. BENEFICIARIES:

Primary Beneficiaries: City College of Calapan (CCC) students, faculty, and administrative staff who will directly benefit from a cleaner, more sustainable, and ecofriendly campus environment.



Secondary Beneficiaries: The local community and future CCC students, who will experience the long-term impact of sustainable campus practices, contributing to a greener and more environmentally conscious society.

VI. METHODOLOGY:

The EcoTech project will follow a structured approach from planning to evaluation to ensure effective implementation and sustainability.

1. Research & Planning

- 1.1 Conduct a campus waste and energy audit to identify key areas for improvement.
- 1.2 Analyze current waste disposal patterns and energy consumption data to determine high-impact zones.
- 1.3 Consult with students, faculty, and administration to gather insights and support.
- 1.4 Finalize the project framework, goals, and implementation timeline.

2. Development

- 2.1 Design and deploy QR-coded waste bins for proper waste segregation.
- 2.2 Install smart energy monitoring devices (smart plugs and sensors) in classrooms and key facilities.
- 2.3 Develop the EcoPoints tracking system, integrating it with Google Sheets or a dedicated app for real-time monitoring.

3. Pilot Testing

- 3.1 Implement the system in select classrooms and common areas for an initial testing phase.
- 3.2 Gather feedback from users, addressing technical or usability issues.
- 3.3 Make necessary adjustments and improvements before full-scale deployment.

4. Implementation

- 4.4 Roll out EcoTech across the entire CCC campus, ensuring all students and faculty are involved.
- 4.5 Integrate EcoTech into student activities and academic courses, promoting long-term engagement.



4.6 Launch awareness campaigns and training sessions to educate the campus community on sustainability practices.

5. Monitoring & Evaluation

- 5.1 Track the project’s impact through data analytics, waste audits, and energy consumption reports.
- 5.2 Conduct surveys and interviews to assess student and faculty engagement.
- 5.3 Identify areas for optimization and expansion, ensuring long-term sustainability.
- 5.4 Prepare a final project report detailing outcomes, challenges, and recommendations for future improvements.

VII. LOGICAL FRAMEWORK MATRIX:

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Critical Assumptions
Goal	Successful implementation of the EcoTech project, leading to improved sustainability practices on campus.	Final evaluation reports, surveys, and waste/energy consumption data analysis.	Students, faculty, and staff actively support and participate in the project.
Purpose/ Outcome	Increased awareness and participation of students in sustainability efforts, reducing waste mismanagement and energy consumption.	<ul style="list-style-type: none">- Waste audits show a 30% reduction in improper disposal.- Energy monitoring data reflects a 20% decrease in consumption.- At least 70% of students engage in the EcoTech reward system.	<ul style="list-style-type: none">- Monthly waste and energy reports.- Student engagement surveys.- QR code scan records from waste sorting bins.



Outputs	<ul style="list-style-type: none">- Development of students' environmental responsibility and adoption of ecofriendly behaviors.- Proper waste segregation and reduced energy wastage.	<ul style="list-style-type: none">- Number of QR waste scans recorded weekly.- Student feedback and participation logs.- Smart plug energy consumption reports.	<ul style="list-style-type: none">- EcoTech incentives encourage active student participation.- Faculty and administration support project integration into campus policies.
Inputs/ Activities	<ul style="list-style-type: none">-Implementation of QR-coded waste bins.- Installation of smart plugs in classrooms.- Launch of the EcoPoints reward system.- Awareness campaigns and student orientation.	<ul style="list-style-type: none">- Completion of all scheduled activities within the timeline.- Number of students attending EcoTech orientation.- Usage reports from QR tracking system and smart plug monitors.	<ul style="list-style-type: none">- The project receives approval and support from CCC administration.- Technical issues are minimal and resolved quickly.

Table 1: Logical Framework Matrix

VIII. RISK-BASED MANAGEMENT PLAN:

Area of Possible Risks/ Opportunities	Risk Register/ Opportunities	Possible Effects	Addressing the Risk/ Opportunities	Frequency/ Deadline
Implementation of QR Waste Sorting System	Risk: Low student participation in using QR-coded waste bins.	Reduced efficiency of waste segregation and tracking.	- Conduct awareness campaigns to educate students on the benefits of proper waste disposal.	Implementati on of QR Waste Sorting System
EcoPoints Reward System	Risk: Lack of student engagement in the reward system.	Reduced motivation to participate in sustainable practices.	- Collaborate with school canteens, or organizations to provide attractive rewards.	EcoPoints Reward System



Sustainability of the Project	Risk: Lack of administrative support for longterm implementation.	Difficulty in securing funding and resources for continuous operation.	- Present datadriven reports to school administration showcasing project impact.	Sustainability of the Project
-------------------------------	---	--	--	-------------------------------

Table 2: Risk-Based Management Plan

IX. BUDGETARY PLAN:

The **EcoTech** project expenses will cover essential components such as materials, rewards, and operational costs to ensure effective implementation. Each phase of the project has designated funding, with a total estimated cost of ₱73,500. However, specific allocations, including sponsorship contributions and adjustments based on feedback, may be subject to change as the project progresses.

Category	Item Description	Quantity	Unit Cost	Total Cost
Waste Management System	QR Code Stickers for Waste Bins	50	15	750
	Durable Waste Bins (Color-Coded)	10	1,500	15,000
	Printing of Educational Signages	10	300	3,000
Smart Energy Monitoring	Smart Plugs (Energy Monitoring)	10	1,200	12,000
	IoT Energy Monitoring Sensors	5	2,500	12,500
	Power Strips with Surge Protection	5	600	3,000



EcoPoints System	Development of Tracking System (Google Sheets/Website/App)	1	5,000	5,000
	Reward Items (School Supplies, Vouchers)	-	-	5,000
Awareness & Training	Workshop and Training Materials	1	3,000	3,000
	Marketing & Promotional Materials (Banners, Flyers)	-	-	2,500
Operations & Maintenance	System Maintenance (Software Updates, Repairs)	-	-	5,000 (Annual)
	Contingency Fund (10% of total budget)	-	-	6,750
TOTAL ESTIMATED COST				73,500 PHP

Table 3: Budgetary Plan for EcoTech project



X. EXPECTED OUTPUT:

Upon completion, the EcoTech project is expected to achieve the following:

- Improved waste management through the QR code tracking system, ensuring proper waste segregation and disposal.
- Reduction in unnecessary energy consumption, as monitored and optimized by smart plugs and energy tracking systems.
- Increased student engagement in sustainability initiatives, driven by the EcoPoints rewards system that incentivizes eco-friendly actions.
- Establishment of a model sustainability program that can be replicated and expanded to other schools or institutions, promoting a broader impact on environmental responsibility.

XI. SUSTAINABILITY/EXIT PLAN:

To ensure the long-term success and continuity of the EcoTech project, the following sustainability strategies will be implemented:

- **Ongoing System Maintenance:** A team of student volunteers and faculty members will be assigned to oversee the maintenance of QR code waste bins, smart energy monitors, and the EcoPoints system, ensuring smooth operation.
- **Integration into Campus Activities:** The EcoPoints system will be embedded into existing CCC events, student organizations, and academic programs to encourage continuous participation and engagement.
- **Community and Business Partnerships:** Local businesses and organizations will be engaged as potential sponsors to provide incentives and rewards, further motivating students to adopt sustainable practices.
- **Institutional Support and Expansion:** An annual sustainability report will be presented to CCC administrators to assess impact, secure funding, and explore expansion opportunities for broader campus-wide implementation.

XII. MONITORING AND EVALUATION:

To ensure the effectiveness of the EcoTech project, a structured monitoring and evaluation process will be implemented:



1. Data Collection Methods

- Conduct regular waste audits to measure the impact of the QR code-based waste sorting system.
- Track energy consumption using smart plugs and comparison reports to assess reductions in electricity usage.
- Monitor student participation through EcoPoints data, analyzing trends in engagement.
- Gather qualitative feedback through surveys and focus group discussions to improve user experience and project effectiveness.


2. Evaluation Metrics

- Waste Management Success Rate: Measure the percentage reduction in improper waste disposal.
- Energy Conservation Impact: Assess the decrease in classroom energy consumption based on smart plug data.
- Student Engagement Level: Track the number of students actively participating and earning EcoPoints.
- System Efficiency: Record the number of technical issues encountered and resolved to ensure smooth operations.

3. Reporting and Continuous Improvement

- Monthly progress reports will be submitted to CCC's Student Parliament to track milestones.
- Conduct semi-annual assessments to identify areas for optimization and expansion.
- Adjust the EcoPoints incentive system based on student feedback to enhance engagement.
- Perform an annual sustainability review to explore further integration, scaling, and institutionalization within CCC.

Prepared by:


APRIL ROSE L. DAPITO
Candidate, BSIS- CCC

JOHN GLEN D. EVANGELISTA
Candidate, BSIS- CCC