University : National Chin-Yi University of Technology
Country : Taiwan
Web Address : www.ncut.edu.tw

**[SDGs 7] Affordable and Clean Energy 可負擔能源**

**[7.2.3] Does your university as a body have a process for carbon management and reducing carbon dioxide emissions?**

NCUT is deeply committed to addressing climate change through a comprehensive Greenhouse Gas (GHG) Emission Reduction Program. This program integrates policy frameworks, technological innovation, nature-based solutions, academic leadership, and community engagement to systematically reduce $CO_2$ emissions and contribute to Taiwan's and the UN's sustainability goals.

## 1. Policy Framework

- NCUT has established an Environmental Policy emphasizing compliance, pollution prevention, recycling, and continuous improvement.
- The Carbon Neutrality Center (est. 2022) leads initiatives for carbon inventory, reduction projects, and education.
- NCUT follows ISO 14064-1 (GHG Inventory) and ISO 14067 (Carbon Footprint of Products) to ensure accurate monitoring and verification.

## 2. Carbon Inventory and Monitoring

- Annual GHG inventories cover Scope 1 (direct), Scope 2 (purchased energy), and Scope 3 (indirect emissions).
- Smart energy management systems integrate IoT-based real-time monitoring, automated lighting, and climate control, optimizing energy use across buildings.

## 3. Emission Reduction Measures

### 3.1 Energy Efficiency and Infrastructure

- LED lighting (97.9% coverage) and high-efficiency HVAC (98.8%) significantly reduce energy demand.
- Water-energy nexus: 40% of treated wastewater is reused for irrigation and replenishing Mingxiu Lake, lowering energy used in water treatment.
- Green building upgrades: Renovations and new builds comply with Taiwan's EEWH Green Building Label and use low-carbon construction materials such as recyclable steel, wood, and calcium silicate boards.

### 3.2 Renewable Energy Integration

- Rooftop **solar PV and solar-thermal systems** installed on dormitories, the Engineering Building, and the Mechanical Building.
- **Power generation data is publicly disclosed online**, ensuring transparency.

### 3.3 Nature-Based Solutions

- NCUT collaborates with **Green G 泉 Social Enterprise** and the **Yunus Social Business Center** on Taiwan's first **zero-carbon travel program**.
- The university dedicates **2 hectares of hillside land** for tree planting, focusing on native species such as *Cinnamomum kanehirae (bull camphor)*.
- Each tree is tagged with GPS and monitored for growth, and participants receive **carbon offset certificates**.

### 3.4 Low-Carbon Mobility

- NCUT partners with **U-Bike (iBike)** to establish a bicycle station on campus, encouraging students and faculty to replace motorcycles with zero-emission commuting.

## 4. Academic Leadership and Partnerships

- NCUT hosted the 2025 GTEA Green Technology Engineering and Application Conference, highlighting hydrogen energy, smart machines, and carbon cycle technologies.
- The Yunus Center at NCUT (the 89th worldwide) promotes the vision of "Zero Poverty, Zero Unemployment, and Zero Net Carbon Emissions," integrating social enterprise with environmental sustainability.
- NCUT actively collaborates with government, industry, and international partners to advance carbon reduction and ESG practices.

## 5. Engagement and Education

- NCUT trains "Green Collar Talent" to support carbon reduction in industries.
- Faculty and students engage in carbon inventory practices for partner companies, helping local businesses adopt $CO_2$ reduction strategies.
- Campus-wide campaigns promote low-carbon lifestyles (e.g., reducing bottled water use, promoting bicycles and public transit).

## 6. Engagement and Education

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## 7. Contribution to the SDGs

- **SDG 7 – Affordable and Clean Energy**: Renewable energy integration and energy-efficient technologies.
- **SDG 9 – Industry, Innovation and Infrastructure**: Green building renovations and smart campus systems.
- **SDG 11 – Sustainable Cities and Communities**: Creating a model low-carbon, sustainable campus.
- **SDG 12 – Responsible Consumption and Production**: Use of low-carbon, recyclable construction materials.
- **SDG 13 – Climate Action**: Systematic GHG reduction program and verified carbon offsets.
- **SDG 15 – Life on Land**: Tree planting and reforestation programs.
- **SDG 17 – Partnerships for the Goals**: Collaboration with government, industry, and international partners.

Through the integration of ISO-standard carbon inventories, smart technologies, renewable energy, green building practices, nature-based offsets, and sustainable transportation, NCUT demonstrates a holistic approach to reducing GHG emissions. The program exemplifies how a university can align academic, operational, and community efforts to achieve carbon neutrality goals and set a benchmark for sustainable higher education in Taiwan and beyond.

# The 5th "422 Gaia Day


The 5th "422 Gaia Day – Earth Restoration Action" series of events, co-hosted by the Taichung City Government, the Energy and Environmental Technology Center of National Chin-Yi University of Technology (NCUT), the Taiwan Energy and Environmental Development Association, and Wepust Technology, was successfully held at the "Heart Valley Sustainable Education Park."

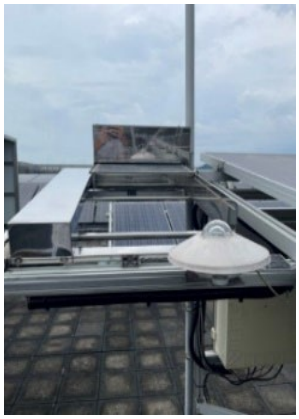
# GREEN INNOVATION LEADING THE FUTURE — NCUT HOSTS "2025 GTEA SYMPOSIUM ON GREEN TECHNOLOGY AND ENGINEERING APPLICATIONS"

To Address Energy Shortages and Climate Change, NCUT College of Engineering Hosts 2025 GTEA Symposium on Green Technology and Engineering Applications

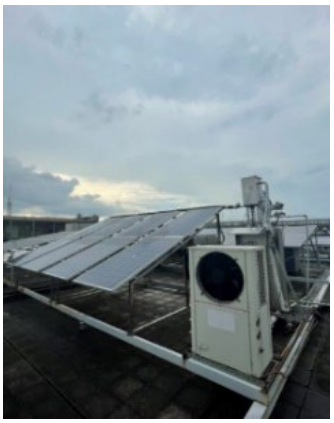
In response to the challenges of energy scarcity and climate change, the College of Engineering at National Chin-Yi University of Technology (NCUT) held the 2025 GTEA Symposium on Green Technology and Engineering Applications on May 23. Centered on the theme of green technology, the event integrated engineering applications with industrial practices to explore pathways toward sustainable development.

Solar panels

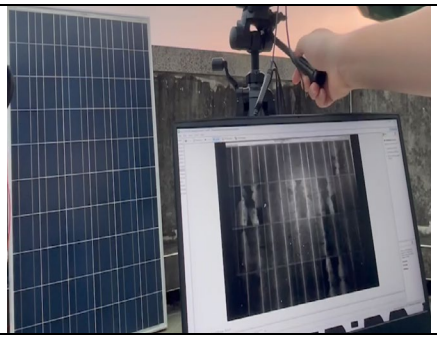
weather station



Illuminometer

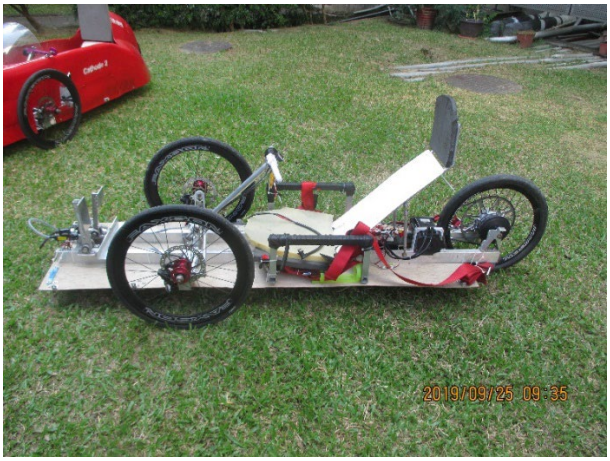


heat pump



Solar photoelectric detection teaching

Special production of solar photoelectric cleaning machine



國立勤益科技大學
NCUT

| Solar energy generation System | Electric vehicles developed by NCUT |
|---|---|
|  |  |

**Solar energy generation**



國立勤益科技大學

# 溫室氣體盤查報告書

Ver 1.0

國立勤益科技大學

111 年 08 月





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|---|---|
| 學校名稱 | 國立勤益科技大學 |
| 校長 | 陳文淵 |
| 教職員生總人數 | 10560 |
| 學校地址 | 臺中市太平區中山路 2 段 57 號 |
| 溫室氣體管理人員 | 2 |
| 聯絡電話 | 04-23924505 分機 2576 |
| 傳真 | 04-23933691 |
| 電子郵件信箱 | jaspera@ncut.edu.tw |

### 1.3 校園溫室氣體減量政策

1 本校成立有能源管理委員會，審議及推動全校節能事項。
2 本校訂定有節能管理辦法，對校內大型會議室空調冰水主機進行監控，如全校用電達契約容量之 95%時，系統即對各大樓冰水主機輪流進行卸載，藉由此一管理機制之運作，減少超約遭致台電罰款之機會。
3 本校節能管理辦法規定，由業務承辦單位定期對校內各單位進行節能情形進行查核，並於相關會議提報各單位違規情形，以收警惕之效果。
4 本校動支校務基金新台幣 380 萬餘元，改善本校國秀樓普通教室傳統照明燈具，汰換為 T5 節能燈具，更換後照度增加，節能效果顯著，約可減少 29%電能，一年可節省用電 116,827 度(KWH)，大幅減少用電。
5 配合台電已提高供電電壓為 22.8 KV 之需要，將全校既有 11.4 KV 高壓變壓器更換為高效率之 11.4/22.8 KV 高壓變壓器。
6 電信費用節費措施：96 年 11 月份由事務組與「中華電信公司」簽訂三項「電信服務契約」，97 年起並由中華電信公司免費佈設一條 E1 專線，與本校數位式總機系統結合，可享市內月租費 8 折、市內電話費 8 折、長途電話費 8 折、市話撥中華行動電話 5 折、市話撥非中華行動電話 55 折、及群組內 0.03 元/秒等多項優惠措施。97 年全年電信費用節省近 28 萬元。98 年 7 月底已完成網路電話機制建置，達成開放教職員工、學生、家長等校內、外免費通話網路之目標，進一步節省電信費用支出。本校數位電訊系統成效如下：
(一) 與教育部網路語音交換平台整合，進行電話節費，達到校園開源節流之政策。
(二) 透過本校數位電訊系統與其他學校及教育部各所屬單位相互撥打語音通話費用免費。
(三) 校內任何話機都可以撥打到學術網路（TANET）電話單位。
(四) 校外單位欲撥打本校學術網路網路電話，可直撥本校網路電話代表號。
(五) 其他學校及教育部各所屬單位網路電話簿查詢網址，可查詢教育部與已銜接學校之網路電話號碼，達到校內、外免費通話網路之目標，進一步節省電信費用支出。
7 國秀樓、圖書資訊館及行政大樓之空調小型送風機改以時間電驛控制方式管理。
8 公共區域中央空調系統之冷卻水塔每年進行清洗，以達節能省電之目的。
9 新近完工圖書資訊館之燈具及用水器具均使用已符合省能、省水標章器具。
10 減少紙張浪費措施：本校為減少紙張浪費，除大力推動各項業務電子化外，並要求同仁採用再生紙及雙面列印，更於新圖書資訊館建置無紙化會議室，以減少會議時紙張浪費，同時提高會議效率。



**Greenhouse Gas Inventory Report**

**Campus-Wide Energy Monitoring System**: NCUT is advancing its commitment to energy efficiency by planning and implementing a campus-wide energy monitoring system, with the contract officially awarded this year. The system is scheduled for completion by December. Once operational, it will provide real-time electricity consumption data, enabling direct energy-saving management and control. This system will play a crucial role in strengthening the university's energy-saving mechanisms and optimizing resource usage.

**Energy-Saving Promotion**: To promote energy conservation and carbon reduction, NCUT has taken visible and impactful measures:

- Large-scale energy-saving and carbon-reduction banners have been hung on the outer walls of key buildings like Guoxiu Building and Ching-yong Hall. These banners serve as constant reminders for teachers, students, and visitors to integrate energy-saving practices into their daily lives.
- LED marquees across the campus continuously display the ten major energy-saving and carbon-reducing measures, ensuring that the message reaches the campus community day and night.
- Energy-saving reminders, such as guide stickers, are placed near light switches in every building, encouraging mindful energy usage.

**Automated Energy-Saving Measures**: In public areas, all water dispensers have been programmed with automatic on/off switches. These dispensers are set to power off at 11:00 p.m. and automatically power on at 6:00 a.m. the following day. This automated schedule effectively reduces energy consumption, contributing to the university's overall energy-saving initiatives.

**Description:**

1. **Annual Greenhouse Gas Inventory Report**: NCUT is committed to environmental stewardship through the diligent preparation of an annual "Greenhouse Gas Inventory Report." This comprehensive assessment of the university's greenhouse gas emissions enables precise calculations and fosters a systematic approach to reducing these emissions over time. The report serves as a critical tool in the university's sustainability efforts, guiding the implementation of effective emission reduction strategies.
2. **Solar Power Initiatives**: NCUT has made significant strides in sustainability by installing solar power generation systems on key structures, including the machine tool building, Chin-Yi dormitory, and the engineering school building. These installations are instrumental in

reducing greenhouse gas emissions, showcasing the university's commitment to leveraging renewable energy to lower its carbon footprint.

3. **Solar Power in the Engineering Hall**: The NCUT Engineering Hall is equipped with a solar power generation system on its top floor, which utilizes solar radiation energy to generate electricity. This innovative system absorbs heat and converts it into electrical power, contributing to the university's overall energy efficiency and sustainability goals.

4. **Electric Vehicle R&D and Battery Management**: NCUT is at the forefront of advancing the electric vehicle research and development sector. A key component of this initiative is the deployment of a battery management system (BMS), which significantly extends the lifespan of batteries. This effort not only promotes sustainable practices but also positions NCUT as a leader in the development of technologies that support the transition to cleaner energy sources.