Sustainable Technology Research and Demonstration Center for Earth Structures

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MU Design Inc. Japan
Objectives

Marketing and Packaging

• Provide Vehicle for Funding and Income 資助、
• Establish Demonstration Center 建立示範中心
• Focus and Prioritize Initiatives 重點和優先次序的倡議
• Educate, Train, Research 教育, 培訓 , 研究
• Facilitate Cooperation, Build Partnerships 促進合作, 建立夥伴關係
• Set Goals and Key Performance Indicators. 設定的目標、關鍵性能指標
Concentration of earth structures continually inhabited in Fujian, China
Bridging Past and Future
銜接過去和未來

• Past: sustainability of rammed earth structures, and Hakka lifestyle

• Future: Total environmental solutions for energy efficiency, water usage and regional environmental management.
Center for Earth Structures 地球結構研究中心
Research and Demonstration

- Develop site near existing Tuolu in the heart of China’s World Heritage Site of Hakka Architecture 建立現有鄉村的中心附近
- Promote earth based construction and total sustainability. 推動地球的基礎建設和總的可持續性
Center for Earth Structures
Research and Demonstration Site

Monitor, preserve and restore existing structures

監測, 保護, 恢復現有建築物
Center for Earth Structures
Research and Demonstration Site

- Identify Sustainable Solutions for local development
  確定為當地發展的可持續的解決方案
Center for Earth Structures
Research and Demonstration Site

Focus on comprehensive environmental solutions to regional issues

地區問題全面的環境解決方案
Center for Earth Structures
Research and Demonstration Site

Provide research, education and training programs and facilities

http://www.inforse.org/europe/seminar03_photos.htm
The Model  模式
Center for Alternative Technology
替代技術中心
CAT

Wales U.K
What is CAT?
Participate in Your Future 參與你的未來

- Over 65,000 visitors per year 每年遊客超過 65,000
- Individual and family memberships 會員
- School programs 學校課程
- Research and residency programs 研究和住院醫生
- Advanced education 先進的教育
- Seminars and conferences 研討會和會議
Center for Education and Training
Est 1973

- Visitor center - 7 acres of hands on displays
- 90 permanent staff and 60 volunteers
Practical Solutions and Applications of Sustainable Low/High Technology
Information Center 信息中心
Comprehensive Sustainable Solutions
全面和可持續的解決方案

http://www.cat.org.uk/
Biotope 生活小區
Structures
Monitor Sustainable Technology
監測可持續技術
Educate 教育 Challenge 挑戰
Demonstrate 展示技術
Sponsorship 贊助

Is the output reading zero?
Then, people on a short course in our Solar Lab, may have disconnected the roof temporarily.

Roof Integrated PV
Fifteen years ago, we installed the first roof made of Photovoltaic Cells (PV) in the UK.

Building Integrated PV is now one of the fastest growing areas of the industry. That's because the cost of cells can be offset against savings in labour and materials spent on the underlying building.

With thanks to Dulas for sponsoring the current general refurbishment and upgrade of wiring.
CAT – Research Projects

Building material and performance research

http://www.cat.org.uk/
CAT – Residency Program

- 2 Cabins – 18 people
- Complete monitoring of energy inputs and outputs
- Calculate energy efficiency of turbines and solar cells.
- Monitor water usage

http://www.cat.org.uk/
Wales Institute for Sustainable Education

研究所課程

- Distance-Learning MSC programs University of East London
- MSc Architecture
- MSc Environmental Change & Practice
- Phd Ecological Building Practices
- Seminars & Conferences.

http://www.cat.org.uk/
Eden Project Cornwall U.K

Cultural Heritage

Storytelling 評書
Concerts 演唱會
Art Exhibitions 藝術展覽
Joint Environmental Initiatives in China

- Eco City Development
- Energy Efficiency
- Urban Planning

Tianjin – JV
China/Singapore

JUCCCE
Joint US-China Collaboration on Clean Energy

• Mayor Training Program (Educate, influence policy)
• Promote Energy Efficiency
• Promote cooperation

http://juccce.com/forum/
Eco-Partnerships Program

- High Level Government Program
- US – China Partnerships

Tulane University & East China Normal University

*global sustainable model for coastal cities*

http://www.ecopartnerships.gov/
Huangbaiyu Project

- Clear objectives 明確的目標
- Oversight 監督
- Local circumstances 當地情況
International Cooperation

- Auroville Earth Institute (India)
- International Vernacular Architect Unit – Oxford Institute of Sustainable Development
- Institute for Historic Building Conservation
### Funding Options 資金類型

**Initial government funding** 啟動政府撥款

#### Table 2 Financial Guideline

<table>
<thead>
<tr>
<th>Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center Income</td>
<td>20%</td>
</tr>
<tr>
<td>Visitor admission fees</td>
<td></td>
</tr>
<tr>
<td>Training programs</td>
<td></td>
</tr>
<tr>
<td>Seminars</td>
<td></td>
</tr>
<tr>
<td>Membership Fees</td>
<td>10%</td>
</tr>
<tr>
<td>(individual, corporate, academic, government agencies)</td>
<td></td>
</tr>
<tr>
<td>Private Sector Sponsorship</td>
<td>25%</td>
</tr>
<tr>
<td>Government Sponsorship</td>
<td>45%</td>
</tr>
</tbody>
</table>

- Tourist Activities 旅游活動
- Demonstrate Commercial Products 展示商業產品
Public Private Partnerships  公私營合作
Corporate Participation 企業參與

- Link Companies and Center Objectives
- Promote Local and Regional Suppliers
- Company Data Base

Example
Solar power companies
Strategy 戰略

Key Players

• Xiamen University 廈門大學
• Chinese Government Representatives 中國政府代表
  Local Provincial and Federal
• Business Representative 業務代表
Strategy 戰略
Stage 1

• Establish Steering Committee 建立督導委員會
  (government, academic, business sectors)
• Identify Potential Partners
• Set Goals 設定的目標
• Key Performance Indicators 關鍵性能指標
• Identify and clarify intent of all partners
Strategy 戰略
Stage 2

- Initiate Private sector involvement
- Develop market survey
- Site selection - competition
Opportunities 機會

- Capitalize on the environmental sustainable historic structures
- Preserve and restore Hakka villages
- Retrofit to current living standards, increase energy efficiency
- Combining traditional techniques, new technology and design
- Educate, train, demonstrate and promote practical sustainable solutions
- Support regional development and influence decision-makers
- Promote heritage-led regeneration and access to the historic environment
- Provide training to create employment opportunities in sustainable development in rural areas
- Demonstrate viability of sustainable earth based construction in remote and/or developing regions within a practical living environment

Take advantage of government eco cities, and rural development programs.
Center for Earth Structures

A Sustainable Demonstration Model

- Education and Demonstration – create demand
- Education and Training – create employment
- Applying sustainable solutions – improve living standards

- 教育和示範 - 創造需求
- 教育和培訓 - 創造就業機會
- 實施可持續的解決方案 - 提高生活水平