

# 2011 ANNUAL REPORT ON NATIONAL SUSTAINABLE DEVELOPMENT





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On 23 August 1997, the National Council for Sustainable Development (NCSD) was established by the Executive Yuan to construct healthy sustainable homeland and pursue national sustainable development. Besides evaluating issues related to sustainable development, the NCSD completed important documents such as the “Taiwan Sustainable Development Declaration,” “Taiwan Agenda 21,” and the “Sustainable Development Action Plan”. At the 31st working meeting of NCSD in April 2011, revisions pertaining to the Sustainable Development Action plan were made, and relevant evaluation meetings were subsequently conducted.

In the 24th NCSD Meeting, Premier Wu Deny-yih stated that: Taiwan, as part of the global family, should ensure participation in next year’s United Nations Conference on Sustainable Development, scheduled to be held in Rio, Brazil; proper budget should be allocated to ensure participation and to provide subsidies to civic groups.

This year’s annual report compiles the significant achievements made by the public, private and civil sectors toward sustainable development in 2011. Topics covered in this edition include Current Status and Achievements of the NCSD (Chapter 1); Summary of Working Group Achievements (Chapter 2); Evaluation of Taiwan’s Sustainability Indicators in 2010 (Chapter 3); 2011 National Sustainable Development Award Recipients (Chapter 4); 2011 International Forum on Sustainable Development (Chapter 5) and Words from Our Members (Chapter 6). The appendix provides a chronicle of important events related to sustainable development, the organizational framework of the NCSD and the names of council members.

The Annual Report on National Sustainable Development is published each year for the purpose of providing the international community with a better understanding of our nation’s efforts and achievements toward sustainable development. Another objective of the report is to raise public awareness of sustainable development and encourage more people to work together in attaining the vision of sustainable development.



# Current Status and Achievements of NCSD in Taiwan



Premier and NCSD Chairman, Wu Den-yih presides over the 24th NCSD Meeting

## 1.1 Meetings Convened

### I. Committee Meetings:

The 24th NCSD Meeting was convened on 9 September 2011 and presided over by Premier Wu Den-yih. Participants of the meeting included government and civil committee members of the NCSD and representatives from various agencies. Three themes were discussed at the meeting: planning for the upcoming 2012 United Nations Conference on Sustainable Development (Rio+20), revisions to the Sustainable Development Action Plan, and operations of the NCSD. Premier Wu Den-yih stated that: Taiwan, as part of the global family, should ensure participation in next year's United Nations Conference on Sustainable Development, scheduled to be held in Rio, Brazil; proper budget should be allocated to ensure participation and to provide subsidies to civic groups; in addition, the specific tasks and expected results of the Sustainable Development Action Plan should be confirmed through subsequent meetings of respective working groups; simultaneously, relevant agencies could draft proposals and report to the NCSD (respective working meetings or working meetings) with regard to future important national economic development plans.

After discussions and integration of opinions, the NCSD can submit consultation results to the Executive Yuan as reference to ensure ample time for NCSD members to contribute their professional knowledge and opinions.

### 2. Working Meetings:

1. NCSD was convened on 8 April 2011 and presided over by CEO Christina Liu. Two themes were discussed: revisions to the NCSD Sustainable Development Action Plan and implementation results in 2010, and implementation status of respective NCSD Working Groups.
2. Meeting of the NCSD was convened on 10 May 2011 and presided over by CEO Christina Liu. Three themes were discussed: implementation status of respective NCSD Working Groups, a proposed bill by NCSD member Alice Yu, and proposal of the 24th NCSD Meeting.

## 1.2 Sustainable Development Action Plan Revisions

In light of the fact that time differences exist in the drafting of Taiwan's Sustainable Development Policy guidelines, Sustainable Development indicator system and



↑ Council member, Alice Yu, speaks at the commendation ceremony.

Sustainable Development Action Plan, which resulted in incoherence and lack of congruency, appropriate integration and revisions are needed pertaining to certain aspects, themes or indicators to ensure more efficient sustainable development work. At the 31st working meeting in April 2011, revisions pertaining to the sustainable development action plan were made, and relevant evaluation meetings were subsequently conducted.

1. The first evaluation meeting was convened in June 2011. The resolution decided to "link" the Sustainable Development Policy Guidelines endorsed in October 2009 with the 2nd version of the Sustainable Development Indicator System endorsed in December 2009.
2. The second evaluation meeting was convened on 10 August 2011 to ensure future nine working group discussions based on the format of the Sustainable Development Policy Guidelines.
3. The third evaluation meeting was convened on 29 August 2011 to discuss the draft action plan formulated by the aforementioned nine working groups. This revision to the Sustainable Development Action plan, linked with the aforementioned Policy Guidelines and evaluation-based Indicator System will surely be beneficial to the congruency of Taiwan's future sustainable development plans.

### 1.3 Evaluation results of the 2011 Sustainable Development Indicators

As objective criteria to evaluate implementation results of the country's sustainable development efforts, the Sustainable Development Indicators (SDI) evaluation results for the previous year are announced annually. The 2010 SDI evaluations were calculated based on the second version of the SDI System as ratified at the 29th

Working Meeting of the NCSD, held on 31 December 2009. The Secretariat of the NCSD requested relevant data from various agencies, and the collected information was then computed and analyzed. An Annual Indicator Meeting was held on 28 November to discuss related issues before the results were announced. For more information, please visit the NCSD website at <http://sta.epa.gov.tw/nsdn/CH/DEVELOPMENT/INDEX.HTM>

### 1.4 Matters pertaining to Taiwan's participation in the 2012 United Nations Conference on Sustainable Development

1. Regarding Taiwan's participation in the 2012 United Nations Conference on Sustainable Development, CEO Christina Liu declared at the 30th NCSD Working Meeting on 25 October 2010: Vice CEO of the NCSD will represent the NCSD and act as vice convener of the 2012 United Nations Conference on Sustainable Development (Rio+20) Task Force, and is also responsible for inviting related agencies and organizations in discussing and planning related matters.
2. The Secretariat of the NCSD invited related agencies, industry representatives, civic organizations and MOFA NGO Committee in holding three consultative meetings on 20 December 2010, 15 February and 2 May 2011. The meetings discussed the model in which Taiwan will participate in the 2012 United Nations Conference on Sustainable Development.
3. Premier of the Executive Yuan and acting Chairperson of the NCSD, Mr. Wu Den-yih, presided over the 24th NCSD Meeting and declared the NCSD will be responsible for all preparatory and delegation tasks of the Executive Yuan; a budget will be allocated for related agencies to participate in the 2012 United Nations Conference on Sustainable Development, and subsidies for participation by domestic civic organizations will be provided as well.
4. Two more consultative meetings with related agencies were convened by the Secretariat of the NCSD on 11 October and 14 November. Two themes were discussed: (1) cooperation between the government, civic organization and green corporations; (2) how to demonstrate Taiwan's efforts in promoting sustainable development and green economy at the UN Meeting.
5. Convened inter-working group meetings on 26 December 2011, and discussed: (1) matters related to the formation of a delegation that will participate in the

2012 United Nations Conference on Sustainable Development; (2) how civic organizations can receive subsidies; (3) compilation of Taiwan's sustainable development efforts.

## 1.5 The 2011 International Forum on Sustainable Development

The 2011 International Forum on Sustainable Development was held on 6 and 7 September 2011, with participation by sustainable development experts from the United States, Canada, Germany and Korea, and city/county representatives and domestic experts. The event included an opening ceremony speech, eight thematic discussions, dialogues with experts, etc. The founder of Earth Workshop gave a speech titled "Review and Future Prospects of World Sustainable Development" during the opening ceremony, and the themes were as follows: sustainable development tasks in Canada,



↑ "2011 International Forum on Sustainable Development" invites many foreign experts to discuss sustainable development issues

sustainable development tasks in the Republic of China, current status regarding the promotion of international sustainable cities, promotion of international sustainable city – Taipei City, promotion of international sustainable city – Kaohsiung City, promotion of international sustainable city – Taichung City, promotion of sustainable development act (basic) in Korea, current status pertaining to the promotion of the 2012 United Nations Conference on Sustainable Development. Themes of the experts' dialogues included: Two main themes of Rio+20 – green economy in the context of sustainable development and poverty eradication, and the institutional framework for sustainable development.

## 1.6 Evaluation and Commendation of the 2011 National Sustainable Development Award

To commend units with exceptional achievements with respect to sustainable development, encourage public participate in sustainable development tasks, accomplish the objectives of implementing sustainable development in a localized and livelihood fashion, and accomplish the national sustainable development vision, the 2011 National Sustainable Development Award was convened. Categories of the Award included four areas: education, corporation, civic and sustainable development action plan implementation. Altogether 10 units won prizes, with the list of winners found in the table. The commendation ceremony was held at the main auditorium of the Executive Yuan on 1 December 2011, and was presided over by Premier of the Executive Yuan and NCSD Chairman Wu Den-yih, who also awarded the winners.

**Table: List of Winners of the 2011 National Sustainable Development Award**

Category	Winner
Education	Michang Elementary School of Bali District, New Taipei City Xiaoming Girls' Senior High School of Taichung City Ci-xing Waldorf School of Yilan County
Corporation	Singtex Industrial Co., Ltd. United Microelectronics Corporation (UMC) TOPPFAN CFI (TAIWAN) CO., LTD.
Civic	Children Are Us Foundation
Sustainable development action plan implementation	Southern Taiwan Science Park Administration: Sustainable environment green park promotion plan Bureau of Standards, Metrology and Inspection, MOTC: establish hazardous chemical substance testing platform to ensure excellent lifestyle for the people plan Railway Reconstruction Bureau, MOTC: Hualien-Taitung railroad overall service enhancement plan



# Summary of Working Group Achievements



Huxi Wind Power Station of Penghu

## 2.1 Energy Conservation, Carbon Reduction and Climate Change Working Group



### 1. Building the legal system of Greenhouse Gas Reduction Act

Continue to promote the legislation of the Greenhouse Gas Reduction Act (draft), and seek ideas from all circles pertaining to the contents of the draft.

### 2. Encouraging voluntary reduction from industries and establishing market mechanisms

- (1) Proclaimed the Guidelines for EPA Greenhouse Gas Reduction Account, and announced the Code Format Governing the EPA Greenhouse Gas Reduction Amount.
- (2) Implemented certification system of greenhouse gas and in total, one accreditation institution and nine certification agencies had been approved, and announced the Technical Directions for Carbon Footprint Inspection of Products and Services.
- (3) Completed the Implementation and Announcement Directions for Carbon Neutrality, and established the Carbon Neutrality Management Platform; further, the

Establishment Guidelines for EPA Greenhouse Gas Pilot Plans and Trade-off Plan Evaluations were formulated.

- (4) Announced emissions factors by the following five industries: steel, cement, optics, semiconductors and power. Continue to promote industrial voluntary report and in total, 401 companies had reported. So far, approximately 80% of emissions by domestic industrial and power entities were reported.
- (5) Already activated the National Greenhouse Gas Reduction Trading Platform and established preliminary management mechanism and accompanying measures; through phased developments, gradually develop a platform that is in sync with international trading platforms.
- (6) Announced the Guidelines Governing the Evaluation of Greenhouse Gas Trade-off for Industries based on Energy Classification Plan

### 3. Constructing Low-carbon Homeland, Green Industry and a Green Lifestyle

The following were in place to enhance our country's

basic inventory capabilities: completed compilation of the Reference Manual for National Low-carbon Food Choices, organized the Regional Carbon Inspection, Low-carbon Diplomacy event and announced the Computation Directions for County/City-level Greenhouse Gas Inventory. A low-carbon platform was established and 1,535 activities were registered thus far. To further the country's low-carbon city infrastructure, New Taipei City, Taichung City, Tainan City and Yilan County were selected as pilots for low-carbon measures.

The Architecture and Building Research Institute (ABRI) of the Ministry of the Interior promoted green buildings that conserve energy and reduce carbon. As of October 2011, 372 cases of green building logos and candidate green building certificates were awarded. The Ministry of Education subsidized 22 elementary and junior high schools to promote low-carbon campus plans, and assisted 23 senior high schools to establish building energy management system (basic level) plans. The National Science Council (NSC) continue to advance national energy science projects and by the end of this year, nation-wide LED replacement of all traffic lights is expected to be completed.

#### **4. Other Greenhouse Gas Reductions and Adjustment Tasks**

The Carbon Capture and Storage Strategic Alliance was established in March and was expected to be operational in 2020; the CEPD completed drafting the National Climate Change Adaptation Policy Guidelines in July; the COA planned to create 6,440 hectares of new forest in plains and hills, and nurture 54,704 hectares of land.

#### **5. Promoting Participation in the UN Environmental Conventions**

The EPA followed the UNFCCC National Communications Guide and completed the second bilingual version of National Communications Guide this year; compiled the National Appropriate Mitigation Actions (NAMAs) bilingual promotional items, and further added Japanese, French and Spanish translations this year; the EPA attended the UNFCCC COP17/CMP7 at Durban, South Africa as demonstration of active

participation in international affairs and exploring opportunities for international cooperation.

#### **6. Promoting International Cooperation on Climate Change**

- (1) Exchange of Climate Change Policies: Organized the International Forum on Toward Carbon Neutrality, 2010 Forum on Low Carbon Development Path in Taiwan, International Symposium on Germany's Renewable Energy Development and Power-purchasing Policy Trends, and the 2011 U.S.-Taiwan Clean Energy Forum.
- (2) Technology exchanges of energy industry: Organized the International Forum on Low Carbon Power Supply System and International Symposium on Greenhouse Gas Reduction Technologies in May and August respectively.
- (3) Discussion on Economic Evaluation of Carbon Market: Organized the EU Climate Policy and ETS expert symposium in May and sent a delegation to the UK and Belgium in October to conduct environmental cooperation between the EU and Taiwan.
- (4) Climate Observation Science Research: Organized the 2011 Air Pollution and Climate – A Dialogue between Science and Policy in Asia conference and the 2011 4th International Workshop on Pacific Greenhouse Gases Measurement in October and November, respectively.

#### **7. Strengthening Education**

##### **I Organized energy conservation and carbon reduction creative events:**

- (1) Organized the Low Carbon Food for the New Year and Healthy Reunion cooking contest, and recipes for the contest were available online.
- (2) Co-organized the LOHAS Taiwan Carbon Reduction 100 series of events.
- (3) Organized the award ceremony and lectures on the Energy Conservation and Carbon Reduction Action Logo event. Forty-four entities from corporations, the community and NGOs were awarded.
- (4) Organized eight rounds of training for the Ecolife Clean Home and Energy Conservation, Carbon Reduction seed teachers. Approximately 1,000 people underwent training.
- (5) Organized four regional meetings of World Citizen's



Coffee Shop, and garnered valuable ideas from all circles.

### II Established internet platform to popularize energy conservation and carbon reduction:

- (1) Enhanced the EPA's Ecolife website
- (2) Monthly publication of the Kuso Newsletter
- (3) Assisted local inspection and subsidy application tasks.

- (4) Completed online flash interactive teaching program and article sharing platform.

### III Wrote energy conservation and carbon reduction literature:

- (1) Compiled the Low Carbon Lifestyle Manual.
- (2) Compiled the Mini Encyclopedia of Climate Change.

## 2.2 National Land and Resources Working Group

### 1. Water Resource Development, Utilization, Management and Conservation

- (1) Promoting drought irrigation and modernized management facilities: Actively assisted farmers in establishing drought irrigation facilities and aided the Taiwan Joint Irrigation Association (TJIA) in constructing modernized management facilities and strengthened the hydrologic automatic reporting system.
- (2) Coordinating the TJIA in providing irrigated water to support livelihood and industrial usages: Due to insufficient rainfall this year, various associations of the TJIA took appropriate measures to counter the situation. Approximately 170 million tonnes of water were transported.

### 2. Sustainable Operation of Maritime Resources

- (1) The MOEA drafted the Demonstration Plan to Accelerate Improvement of Drainage Environment of Areas of Land Subsidence that prioritized areas suffering from flood.
- (2) The Fisheries Agency was responsible for the industry adjustment portion of the aforementioned plan. The objective was to minimize groundwater usage through the completion of 30,000 meters of fish raising pond drainage lines and two sets of sea water induction facility.

### 3. Protection of Water Quality

Completed the planning of on-island and off-shore water body quality management, including inspection locations and methods. Some 100,000 inspection records were to be completed by 2011 and provided online for public viewing (<http://wq.epa.gov.tw>). In addition, basic information of water body environment of Tungsha and Nansha areas were established in June.



All water quality monitoring data can be searched online

### 4. Completed Sustainable National Land Planning

- (1) Promoted legislation of National Land Planning Act: The National Land Planning Act (draft) completed first reading by the Internal Administration Committee of the Legislative Yuan. After negotiations by various parties, the draft will undergo a second reading.
- (2) Implemented national land conservation and reviewing of urban land management: In accordance with Taiwan's regional plan (first overall inspection) in 2010, the CPAMI will continue to assist various counties/cities in the demarcation of various urban land resources.
- (3) Promoted the Demonstration Plan of Coastal Line Remediation and Landscape Improvement: 13 projects from 9 counties/cities were subsidized.
- (4) Organized training workshops for coastal planning and ecological landscape nurturing.

### 5. Integrating Regional Areas to be in Line with the International Community, and Promoting Wetland Ecological Remediation

- (1) Promoted national wetland evaluation and conservation tasks: Organized the second national important wetland evaluation tasks, which as of 18

January 2011 announced 82 key national wetlands, including 2 international sites, 40 national sites and 40 regional sites, with a total area of 56,865 hectares.

The budget for the year 2011 amounted to NT\$41 million. Twenty-nine projects from 16 counties/cities were implemented, including wetland inspection, mitigation, community participation and education.

- (2) Formulated the Wetland Conservation Act draft and accompanying measures: The Wetland Conservation Act draft was first formulated in 2009, and subsequently conducted explanatory tour meetings and public hearings in order to perfect the Act.
- (3) Executed scientific research related to wetlands: Organized the National Investigation Plan on Key Wetland Carbon Sink Functionality, and established the standard operating procedures targeted specifically to the three types of wetlands.
- (4) Assisted wetland subsidy tasks: The 2011 National Key Wetland Conservation Action Plan subsidized 29 key wetlands with tasks regarding surveillance, conservation, community participation and education.
- (5) Organized international exchanges and education programs: Participated in the 2011 Annual Meeting of the Society of Wetland Scientists (SWS), and invited Dr. Ben Lepage, president of the SWS, to conduct three international wetland conservation exchange workshops and one key presentation lecture in



82 key national wetland sites

October. In addition, five more related Training Programs of Wetland Ecology Environment Inspection Procedure were held.

### 2.3 Biodiversity Working Group

Nature conservatory system logo



Ecological restoration displayed through terraces



Ceriagrion melanurum resting on crops from environmental friendly farming



Ripple fairy - hydrophasianus chirurgus

Cooperating with the general public in restoring terrace ecology in Gongliao mountain areas to rehabilitate the harmony between man and nature – the results were the re-emergence of oryzias latipes and ceriagrion melanurum. At the 2011 International Conference on Landscape Conservation, the Taipei Declaration on Landscape Conservation was signed to

protect the near-extinct hydrophasianus chirurgus (down to almost 50 in number), and promote agricultural products of the Kuantien Jacana Green Conservation Plan.

Enhanced marine conservation area to promote potential national parks and organized related research plans; organized public meeting regarding Penghu



Southern Islands – marine national park; organized marine biodiversity campus tour; organized the marine national park exhibition to enhance the public's understanding; organized Tungsha Island clean beach on World Ocean Day, and events such as the building ark, water initiation ceremony, across the Kuroshio Current – visiting Taiwan, and marine culture exhibition; presented results of conservation efforts, and signed an MOU with the National Museum of Marine Biology and Aquarium (NMMBA).

Integrated Taiwan's biodiversity information, international exchanges: established the TaiBIF, TaiBNET and TaiEOL at the Biodiversity Research Center of Academia Sinica, with the goal of establishing an integrated cross-ministerial biodiversity database. Completed the compilation of the Taiwan Crustacean Catalog: completed the Taiwan Crustacean Catalog series (including the Catalogue of Hermit Crabs of Taiwan, Crab-like Anomurans and the Crustacean Fauna of Taiwan) – a total of 307 species, which is 1/8 of the entire world's species; the research results were reported in the New York Times.

**Kenting National Park:** restoring leucaena and its habitat; commissioned 15 biodiversity research plans; established Kenting insect specimen database; utilized automatic photographic equipment to investigate land-based wild mammals; appearance of Yushan bear and hynobius formosanus at the 3,600 meter Yushan mountains. Continue to maintain resource management partnership with Sheding Tribe.

**Taroko National Park:** completed eradication of foreign flora species; promoted conservation of biodiversity, continue to organize Dongsha Marine National Park research and support of endemic species in response to climate change.

**Yushan National Park:** Organized events to appreciate mountain butterflies, animals, eagles, and Dongpu ecological tour; presented results of commissioned biodiversity research and sustainability measures; organized workshop on agricultural ecology for indigenous people.

Hosted the cross-ministerial meeting on the Consultation

on Domestic Marine Conservation Demarcation; maintaining Taiwan's status as a non-infected country and researching risk evaluation and standardized tests for foreign species; advisory programs on the prevention of foreign species invasion and plant pest infections; organized fire ant prevention and pesticide registration promotion events in collaboration with the National Fire Ant Prevention Center; update and expansion of the Taiwan's Foreign Species Database; establishing a catalogue for Taiwan's foreign plants and assessment of risks; promoted Demonstration Plan for Wetland Ecology Park Operation and Management.

The Shei-pa National Park organized a renovation project on the No. 1 Check Dam of Qijia River; created habitat grounds for platelea minor (black-faced spoonbill) at Taijiang National Park; did investigation and research on river structures' impact on river habitats; continued to remediate agricultural pollution; investigation and integrated assessment of national wetland pollutants; formulated river pollution improvement plans and schedules, gradually enhanced Taiwan's river and estuary water quality to be in line with international standards in terms of nutrient salt and heavy metal contents; monitoring of national water quality and public information.

**Forestry Bureau:** Organized the 2011 WildViewTaiwan Film Festival in association with Wildscreen series of events, assisted Mr. Zhang Bo-jun in filming his Loving Fireflies documentary, which won the Excellence award at the third National Publication Award; the Jiujiu Bee Hawk film won the best animal behavior award at the 10th Japanese Wildlife Film Festival. Danielle Nierenberg, a senior researcher from Worldwatch Institute, spoke at the Nurturing Our Earth tour.

Maintained cultural diversity for the indigenous people and local communities; compilation of traditional biodiversity knowledge of the indigenous people; donated to the Wildlife Conservation Society to preserve the Burmese Star Tortoise; organized the International Day for Biological Diversity on 22 May; organized the International Forum on Next Decade of Biodiversity.



1



2

1 Ali Mountain Hynobius formosanus that appeared in the Yushan Peaks

2 Euploea sylvestris swinhoi

## 2.4 Energy and Production Working Group



### 1. Promoting energy integration of industrial parks

The MOEAIDB selected three industrial parks in Hsinchu, Taichung and Youshi (Dajia) as pilot targets for energy and resource integration promotion. Twenty integrated chains were established, with 410,010 tonnes of products and 110,000 tonnes of greenhouse gas reduction. Related integration tasks are still in progress.

### 2. Promoting development of renewable energy

As of October 2011, the capacity of renewable power installations amounted to 3.339 million kilowatts, with an estimated annual power generation of 9 billion kwh. Approximately 1.68 million households could be powered, with an annual CO2 reduction of 5.56 million tonnes. Respective results of renewable energy promotion efforts are listed as follows:

**I Wind power:** As of October 2011, 288 wind-powered stations were set up, with a capacity of 563,800 kw.

#### II Solar power:

- (1) As of October 2011, total national facilities have a capacity of 58.6MWp, equivalent to annual generation of 73.25 million kwh.
- (2) Net worth of domestic solar power industry in 2010 amounted to NT\$200 billion, ranking 3rd in the world.
- (3) Planning to promote the construction of a million solar-powered roofs, following a policy of "slow first, then fast; roofs first, then floors".

**III Bio-energy power installations have a total capacity of 798,500 kw.**

### 3. Promoting energy conservation

#### I Promoting energy saving labels:

- (1) Completed formulating and improving five product criteria of energy saving labels; the newly revised standards require 10~25% improvement in efficiency compared to previous standards.
- (2) Completed formulating seven criteria for energy saving products; three of which were announced.
- (3) Organized 12 energy saving label and energy efficiency label promotion events; a related website was made operational.
- (4) Energy saving label products saved an equivalent of 92,000 kiloliters of fuel, with an estimated 100 million label usages.

#### II Executing energy efficiency management of electronic

#### appliances:

- (1) Completed improvement of three permissible consumption standards of electrical appliances.
- (2) Completed formulation of nine permissible consumption standards of products.

#### III Provided energy conservation technical services:

As of October 2011, 833 big energy consumers and 170 incinerators were given advice, which resulted in findings of potential power savings of 128.6 kiloliters of fuel equivalent, and actual savings of 65.52 kiloliters of fuel equivalent.

### 4. Constant supply of power

- (1) Announced the energy development vision of "ensure nuclear safety, gradual decrease of nuclear generated electricity, establishment of low-carbon green energy and working toward a nuclear-free homeland", and under the three main principles of no restriction of power, maintaining reasonable electricity pricing and fulfilling the international promise of carbon reduction, all measures work toward energy conservation, carbon reduction and steady provision of electricity supply.
- (2) Steady supply of oil and gas: complete storage of required volume of oil and gas in accordance with regulations.
- (3) Steady power supply: Actual result of SAIDI is 15.027 minutes per household per year.
- (4) Promoted establishment of advanced metering infrastructure (AMI) for high power usage clients: completed setting up of 1,200 sets of AMI meters in accordance with AMI Promotion Plan.

### 5. Promoted environmentally friendly science parks

- (1) 104 companies in total were approved, and 63 moved into the science parks, in accordance with the Environmental Science Parks Promotion Plan.
- (2) Promoted energy conservation and carbon reduction counseling for business districts: completed counseling for five commercial districts, achieving a total of 15 thus far. Provided comprehensive diagnosis services for chain businesses, and completed three such diagnoses in the year 2011.
- (3) Provided clean energy and promoted reduction of greenhouse gases: CPC Corporation provided B2 biodiesel throughout all chains; in accordance with the



MOEABOE's plan, 14 petroleum stations provided E3 gasohol. An estimated 200,000 tonnes of CO<sub>2</sub> reduction can be achieved annually.

- (4) Assisted SMEs in achieving energy conservation and carbon reduction: the SME Administration of the MOEA assisted 20 SMEs in their energy conservation and carbon reduction efforts: improvements in the production and manufacturing process, inspection of greenhouse gas/ product carbon footprint and design of low-carbon products. Promoted the Establish Sustainable Energy Standards, Tests and Inspection Platform Plan;
- (5) the BSMI of the MOEA completed 24 cases of greenhouse gas inspections, of which 23 cases had completed their second phase of inspection. Twenty-three greenhouse gas inspection certificates were awarded thus far. Further, since solar power and LED lighting have achieved an industrial scale, a total of 10 experimental inspection items were established.

### 6. Encouraged agricultural sector to promote effective use of agricultural lands

- (1) Thirteen areas of agriculture dedicated zones were established so that farmers were guided to voluntarily maintain farming environments and sign the Dedicated Land Usage Covenant.
- (2) Promoted the commoditization of high-end agricultural products: promoted the integrated Establishment of Agricultural Center and Satellite System Plan, and assisted farming groups to produce unique localized fruits and establish value-added that integrates their needs and provides a steady supply-demand relationship.
- (3) Counseled marketing classes and industrial group purchases in adopting land separation, age category and batch production model, as well as automatic feeding systems to increase production efficiency.

Persimmon ice-cream invented by FanLu Farmers' Association



- (4) Maintained production and consumption balance for poultry: through gathering of information and counseling of organizations, cautionary mechanisms were established to strengthen self adjustment of the industry. The contract ratios were 90% for raised chicken, 80% for wild chicken and duck, and 50% for goose.

- (5) Promoted agricultural excellence product labels: 6,526 products from 346 companies passed the CAS certification, worth NT\$45 billion in total.
- (6) Improved leisure farm production and management environments, and strengthened environmental beautification works. As of October 2011, 71 sites of leisure farms had been announced. Further, new theme tours for farms such as "2 meals and 1 night", "stress release and healing" , and "flower sea", with an estimated annual worth of NT\$6.5 billion.
- (7) Built irrigation management geological database for the TJIA: integrated GIS infrastructure and the irrigation/ drainage land management system.



- (8) Developing the TJIA's website of irrigation management of geological database system

- (8) Strengthened water quality monitoring and management of irrigation water usage: established comprehensive irrigation water inspection network to enhance passing rate of water quality: completed comprehensive irrigation water inspection network to enhance passing rate and assisted the TJIA in enforcing their water quality monitoring and management.
- (9) Promoted tour of the fishing industry: Organized the 2011 Taiwan International Aquarium Expo at Taipei City's WTC Hall 3 from September to October.
- (10) Dedicated sea water and drainage route facilities for the fish farming industry: 37 engineering projects and drainage construction projects were approved, with 2 projects completed thus far.
- (11) Promoted monitoring, management and inspection of coastal fisheries: continued to promote coastal line fishery monitoring. As of this year, there were 104 random maritime inspections.

Implemented GPS system for fishing boats and participated in regional fishery related science meetings; maintained our nation as a non-infected country for key animals; utilized guard dogs to strengthen customs baggage checks to prevent the onset of infectious pests found on illegally transported animals or plants.

## 2.5 Transportation and Livelihood Working Group

### 1. Promoting public road and transport development plans

- (1) Subsidies were provided to public transport of 14 counties and cities (such as Keelung City) and public routes operated by the Directorate General of Highways, MOTC, thereby achieving the goal of keeping buses in operation even in remote areas.
- (2) Assisted replacement of old public transport, totaling 490 buses, and added 139 low-platform buses to the current fleet.
- (3) Assisted installations of multi-card readers and ancillary facilities so as to facilitate electronic ticket integration of all kinds of public transport, and to provide convenience to the general public. 47.27% of all buses have installed the devices.
- (4) Assisted Taichung City and Tainan City in organizing bus evaluation tasks, and assisted in the evaluation tasks by the Directorate General of Highways, MOTC.

### 2. Continue to promote railway transport construction and upgrading services

- (1) Continue to promote railroad and metro construction projects.
- (2) Improved Hualien-Taitung line and completed the linking of the northern section of Shanli Tunnel in May.
- (3) Promoted integrated service enhancement of Hualien-Taitung line: to construct one unique station per township. In particular, Pinghe station and Guanshan station completed the bidding process and are expected to be operational in 2014.
- (4) Organized the design plan of the MRT outside Taoyuan

International Airport, as well as the plan for the extension of the metro line to Zhongli train station.

- (5) Accelerated establishing HSR stations in Miaoli, Changhua and Yunlin Counties.
- (6) Continued to expand Taipei MRT: as of October 2010, 10 lines were operational, with a total mileage of 106.4 km.

### 3. Organizing demonstration plan for Eastern bicycle path networks

The Eastern Bicycle Path Networks Demonstration Plan in Response to Energy Conservation and Carbon Reduction was in force from 2009 to 2012. As of the end of 2011, 469 km of path had been constructed, and reached a total of 1,136km of path with the inclusion of other subsidized agencies.

### 4. Engineering Taiwan's intelligent transport system

- (1) Organized the transport service e-system: integrated the e-traffic Center and Transportation Information Center into one single website.
- (2) Completed establishment of the transport management system of national highways and freeways: Established internet management system for highways and freeways, with a 35.9% increase in usage compared to 2010.

### 5. Promoting ecotourism

To promote ecotourism, the Tourism Bureau organized activities such as beach cleaning and tree planting across



The Old Caoling Circle Bicycle Path



various tourist attractions; further, bicycle path networks were set up to encourage healthy, green lifestyles, with additional focus on ecotourism.

### **6. Enhancing weather reporting and seismic activity forecasts**

- (1) Implemented the fourth year of the Sea Weather E-Service System Integration and Application Plan.
- (2) Implemented the Establishment Plan for the Monitoring and Reporting of Severe Weather.
- (3) Established a new generation seismic observation network. In addition to enhancing observation stations and observation wells, work towards completing Taiwan's first optic-fiber oceanic cable observation network was done. This should improve Taiwan's earthquake/tsunami warning capabilities on the eastern sea border.

### **7. Strengthening the disaster prevention system for public roads and bridges**

- (1) Implemented public road disaster prevention mechanisms: Mandated 63 key monitoring sites for mountainous public roads during flood seasons and 45 monitoring sites for bridges. This year there were 79 precautionary road blocks, out of which 27 sites actually suffered huge-scale disasters afterward. It was fortunate that no lives were lost as a result of the precautionary measures.
- (2) The concept of river system management warning: established a bridge safety warning system for Dajia Bridge.
- (3) Improved standards for shock reinforcement for

highway bridges

### **8. Promoting greenhouse gas reduction plan for the aviation industry and private airports**

- (1) Established greenhouse gas inspection mechanisms and database for Taiwan's major aviation companies.
- (2) Established greenhouse gas inspection mechanisms and database for Taiwan's major airports.
- (3) Completed low-carbon airport instruction manual, and Taipei and Makong airports were the first to sign the Greenhouse Gas Reduction Declaration.
- (4) Completed the first domestic carbon footprint calculation for civil aviation services.

### **9. Promoting green consumption**

- I Strengthened the Green Mark system and established a carbon labeling system
  - (1) In total, formulated 113 product standards related to the Green Mark.
  - (2) Established a quick and fast Green Mark application platform; as of October 2011, 1,250 products were issued with the Green Mark and 10 products were awarded with a Class 2 environmental friendly product certificate.
  - (3) As of October 2011, 93 products from 33 companies were approved with the Product Carbon Footprint Label; 22 product category rules pertaining to carbon footprint labels were announced.
  - (4) Hosted the 2011 International Ecolabeling Conference on 25 October. Forty-nine dignitaries from 24 countries and more than 100 domestic



↑ Tourism and Education Center of the Sun Moon Lake National Scenic Area Administration

representatives participated in this event.

- II Established marketing channels for environmentally friendly products: in total, assisted 10,615 stores to become green stores that sell environmentally friendly products.
- III Strengthened green procurement by the public and private sector: 685 companies submitted their green procurement results to the EPA in 2010, with a total green procurement budget of NT\$3.4 billion.
- IV Education for green consumption: 10 seed training workshops were held, with participation from 627 people. In addition, the 2011 Green Living Expo was held (as shown in diagram 14) to allow the general public to experience green creativity and green living in

their daily lives.

- V The Central Office of the MOEA selected green markets to conduct in-depth counseling for green marketing, as well as promotion of green energy establishment.



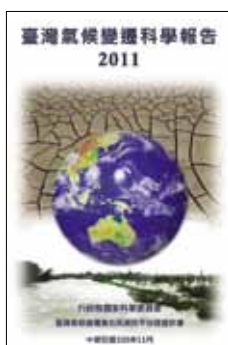
Green Living Expo held in 2011

## 2.6 Technology and Evaluation Working Group

### 1. Taiwan Climate Change Projection and Information Platform

The Taiwan Climate Change Projection and Information Platform (TCCIP) was initiated by the National Science Council (NSC) in 2009, expected to be completed within three years. The National Science and Technology Center for Disaster Reduction (NCDR) was responsible for overseeing and implementation of the plan. The plan focused on integration of applications for climate science research and downstream impacts, strengthened climate change science research and forecast capabilities and implemented application research and services of climate change information. The three year plan not only built analysis, forecast capabilities and downscaling technologies, but also took disaster impact as a central focus and established infrastructure in the integration of climate information and downstream application. This plan will serve as a demonstration research project of the NSC in terms of implementing long-term research and implementation services for climate change.

- (1) Important achievements for 2011: digitization, normalization and internet-formatting of long-term climate research information; 25km and 5km downscaling estimates of Taiwan's region using 24 world climate



The 2011 Science Report on Taiwan's Climate Change



The press conference of T2011 Science Report on Taiwan's Climate Change

models (IPCC AR4); extreme typhoon modeling (5km) and analysis of Taiwan's region using Japan's high resolution model; uncertainty analysis and establishment of climate change information service platform, etc.

- (2) The 2011 Science Report on Taiwan's Climate Change was penned by participants and researchers of the plan. The report was more than 160,000 words in length and supplied the latest scientific research and progress pertaining to climate change of the world and Taiwan. A press conference was held on 9 November 2011 at the NSC, during which the report was made public. The report can be downloaded at <http://satis.ncdr.nat.gov.tw/ccsr/>.

### 2. Promoting sustainable environment green park plan

The Southern Taiwan Science Park (STSP) of the NSC actively constructed comprehensive infrastructure and formulated sustainable management policies geared in



three main directions: grouping of industries, sustainable environment green parks and culture & arts. The STSP hopes to create a model high-tech science park.

### I Sustainable economy

- (1) Promoted green building certification: 6 green building EEWH Diamond level certificates were awarded to the park as of October 2011.
- (2) Promoted green transport: initiated shuttle bus services within in the park, which completed the seamless integration with the HSR. As of late October 2011, more than 270,000 trips were made, resulting in carbon reduction of 740 tonnes, equivalent to the carbon absorption volume 1.9 times that of Daan Park.
- (3) Sustainable environment
- (4) C2C waste recycling green park: as of late October 2011, the waste recycling rate was 81.9%; further, the waste water plant has successfully made bricks out of incinerator sludge particles, and the bricks were displayed in the park. The bricks were further used in the engineering projects in the park, hence taking another step toward zero waste.
- (5) Environment quality management: implemented waste volume control, and there were no records of environmental violations pertaining to the EIA Act since 2001; all facilities within the park are 100% regulation compliant, and there were no records of environmental violations since 2005.

### II Sustainable community

- (1) Environmental education: promoted environmental education that encompassed elementary, junior and senior high schools and the general public. As of October 2011, more than 1,600 people participated in the events.
- (2) Public participation: organized the 2011 Late Spring Art Festival which include 2 archaeology shows and 6 musical festivals. More than 5,000 people participated.

### III Biodiversity metadata software Morpho and promotion and educational training for biodiversity research data storage

Green buildings of Southern Taiwan Science Park are awarded top-level EEWH Diamond certificates in Taiwan

### system

Integration of biodiversity information is the fundamental work of the Executive Yuan's biodiversity promotion plan, which is overseen by the NSC and co-hosted by nine departments, including the COA. In particular, the D1202 item indicated that the organizing committee must build, maintain, update and popularize a biodiversity monitoring database system. The Biodiversity Distribution Information Storage and Management System plan was implemented by the Taiwan Forestry Research Institute; the main objective is to provide domestic researchers the platform to be in sync with international biodiversity research, through the tool Morpho that provides biodiversity metadata compilation and research management tools; educational training workshops, as well as update and maintenance of a Metacat biodiversity research information storage system. Results were as follows:

- (1) Completed localization of the user interface and manual for the updated Morpho software; completed upgrade and maintenance of MetaCat; organized two tiers of biodiversity research information storage workshops in Taipei City and Taichung City from June to September.
- (2) Morpho and Metacat were utilized by the Taiwan Forestry Research Institute, Forestry Bureau, Agricultural Research Institute, Urban and Rural Development Branch of CAPMI, Taroko National Park, etc. for the purposes of long-term storage and sharing of ecology research and biodiversity information.
- (3) Assisted the Urban and Rural Development Branch of CAPMI in collecting information on national key wetlands, as well as educational training for information storage for the Forestry Bureau.



## 2.7 Urban and Rural Development Working Group



### 1. Promoting green building for Eco-cities

- (1) The ABRI of the MOI had long devoted itself to the research of green building, and its completion of the Eco-city Green Building Promotion Plan yielded the following results:
- (2) 372 cases of green building marks and candidate green building certificates were passed. 80.88 million kw of power, 4.32 million tonnes of water and 55,000 tonnes of carbon emission were reduced annually.
- (3) Completed 22 projects under the Building Energy Efficiency Enhancement Plan to improve energy efficiency.
- (4) In terms of lowering urban heat island effects, completed 15 cases of Renewal and Upgrade for Green Buildings Plan.
- (5) In terms of green building promotion, completed 75 rounds of Green Building Environment Education Demonstration and On-site Guide Activity, with participation from 1,787 people.
- (6) Organized Green Building Evaluation Seminar and Green Building Evaluation System Seminar in the northern, central and southern regions

### 2. Promoting green building materials evaluation

- (1) Passed 181 cases of green building materials (143 healthy, 9 renewable, 28 high-functionality and 1 eco-green material), covering more than 1,053 products.
- (2) To safeguard customers' interests and rights of law-abiding companies, market investigations will be conducted annually after the issuance of Green Building Material Mark. Nearly 1/8 of all certified cases underwent inspection last year. As of October, 12 products underwent post-marketing surveillance.
- (3) To encourage green building materials, two 2011 Green Building Material Mark Seminars were held, the Renewable Green Building Material Demonstration Seminar was held once, and the Green Building Material Mark was displayed at the Taiwan International Green Industry Show (TiGiS).

### 3. Promoting the household performance evaluation system

Organized pilot tests on the household performance evaluation system, so that the general public can have a better understanding regarding household performance

evaluation. Completed pilot tests and evaluation promotion on Farglory Hyde Park, Farglory Xinzhuang Central Park and FJU Hostel, numbering 500 households in total; 25 pilot tests on household performance items and contents were conducted.

### 4. Promoting barrier-free household evaluation

To encourage barrier-free households, the barrier-free (friendly) household evaluation contest was widened and achieved the following results:

- (1) Voluntary assessment to encourage the private sector to strive for friendly, barrier-free living environments for the general public.
- (2) Assisted the general public in recognizing which buildings were safe and convenient, and which ones were suitable for the elderly or those with movement limitations.
- (3) six cases of outstanding friendly households and 19 cases of friendly households were determined.

### 5. Promoting earthquake-resistant building mark evaluation

Earthquake-resistant mark certification demands feasibility of structural design and construction for buildings, as well as monitoring mechanisms during project construction. These measures enhance the earthquake-resistance and quality of buildings. Results in 2011 included:

- (1) 23 cases in total were advised, out of which 8 were new and 7 cases had passed the earthquake-resistant design mark. To date, 8 cases had received their earthquake-resistant mark after confirmation and evaluation of their construction conditions.
- (2) Completed 13 rounds of design meetings, 10 construction meetings and 42 rounds of on-site inspections.
- (3) On promotion: completed the Earthquake-resistant Mark Certification Manual, reports in the Economic Daily News, bi-weekly Wealth Magazine and Taipei Metro UPAPER, Old Building Certified Volume Commendation through the Urban Renewal Action Plan of the Executive Yuan and Earthquake-resistant Mark Certification Ceremony events.

### 6. Sustainable Urban and Rural Development

The CAPMI actively promoted sustainable urban and rural development with the following results:

- (1) Completed urban renewal regulations: to ensure that the urban renewal act addresses practical issues, the procedures were simplified. After discussion and amendments to the Urban Renewal Act, an evaluation meeting was held on 15 and 17 August 2011. Simultaneously, the Measures Governing Self Renewal Utilizing the Central Urban Renewal Fund was announced on 10 August 2011, and applications were open until the end of October.
- (2) Civic Urban Renewal case: since the announcement of the Urban Renewal Act in 1998, there were 904 cases of civic applications, of which 334 were approved. As of October 2011, 36 urban renewal projects (including rights change plans) were evaluated and implemented, out of which 22 were maintenance plans.
- (3) Government-centered urban renewal plans: Since 2005, there were 180 urban renewal demonstration sites; 130 demonstration sites completed preliminary urban renewal works, out of which 35 were commissioned by the central government (Agency) or related entities (institutions) or investors; the remaining 89 sites were still in the integrated planning phase, including preliminary planning, urban plan renewal and formulating urban renewal plans. As of the latter half of 2011, 18 sites had reported to the Urban Renewal Task Force of the MOI for further inspection and evaluations.
- (4) Autonomous renewal lectures and community workshops were held in the north, central and south regions to enhance the public's practical skills in organizing autonomous renewals.
- (5) Organized urban renewal lectures, investment explanatory meetings, experience exchange symposiums and urban renewal promotion and business attraction manual.
- (6) Expanded underground waste sewage projects to improve the public's hygiene and standard of living. As of end September 2011, the proliferation rate for underground waste sewage was 28.51%, from an estimated national total of 1.65 million households.

### 2.8 Health and Welfare Working Group

#### 1. Effective implementation of environmental quality management and monitoring

The EPA managed and monitored the air, water and radiation in the environment to enhance the public's living environment, with the following achievements:

- (1) In terms of atmospheric dioxin monitoring, the average concentration was 0.044 pg I-TEQ/ m<sup>3</sup> (as of August 2011), which was significantly lower than the 2010

standard of 0.051 pg I-TEQ/m<sup>3</sup>. All measurements were also significantly lower than that of Japan's level, which was 0.6pg I-TEQ/m<sup>3</sup>. In addition, the national dioxin emission volume for 2010 was 58 g I-TEQ, a massive 82% reduction compared to 2002's level of 327 g I-TEQ. This indicated that dioxin control in the nation has had measurable effects.

- (2) In terms of water management and inspection, local



The 1<sup>st</sup> International Symposium on Elderly Friendly City



environmental agencies were supervised to implement the 2011 Drinking Water Management and Inspection Plan. Random tests were conducted at 513 tap water sources, 443 small water treatment facility sources, and 8,979 cases of tap water quality and 222 cases of small water treatment facility were randomly selected; 5,491 random cases of public drinking water facility management inspections were conducted, covering 4,871 cases of water quality inspections and 207 cases of impure chemical contents in drinking water treatment.

- (3) To facilitate the public's understanding of electromagnetic waves (EMW) in the atmosphere and to enhance their understanding of EMW sources encountered in daily living in order to heighten their alertness and prevent any unnecessary panic, the EPA randomly conducted EMW tests at 230 sites (including extremely low voltage transformers, high voltage towers, broadcast stations and transmission bases). The test results all fell within acceptable standards. Collaboration with related promotional events continues to occur to educate the risks of non-ionizing radiation.
- (4) Completed formulating the draft of Preventive Guidelines for the Establishment of Non-ionizing Radiation Facilities in Sensitive New Regions, and established the experts' panel on Discussion on Appropriateness of Non-ionizing Radiation Standards based on public participation and an expert representatives mechanism.

## **2. Continue promoting outstanding agricultural products**

The COA continues to promote Taiwan's agricultural products. In addition to promoting the mark mechanism, it also conducted the following counseling:

- (1) Promoted Taiwan's famous tea and encourage the public to consume more of Taiwan's excellent quality tea. Assisted the Association of Taiwan Tea (ATT) in organizing the World Health Day: Tea for Everybody series of events from 7 April to end of June. 7 April was also laid down as the World Health Day: Tea for Everybody to encourage more consumption of tea. Also, in response to the 311 Earthquake of Japan, farm land dedicated to pear production was increased by 70 hectares to meet the demand for pear.
- (2) As of 17 November 2011, the COA had helped to establish 42 rice marketing zones; assisted with 156 rounds of planting management, safe usage of pesticides, reasonable usage of fertilizers and sales

records; 219 inspections of farming pesticide residues all passed. Further assisted 61 rice-producing entities (including 7 organic ones) in following the Taiwan Good Agricultural Practice (TGAP), as well as introduced a third party certification system. 3,873 hectares (including 307 hectares for organic rice) of land passed the production and marketing resume certification process.

- (3) In terms of mark promotion, the CAS label and GAP label continue to bear significance. As of October 2011, 6,526 products from 346 companies passed the CAS certification; another 11 items for animal products concerning the TGAP were announced. Animal raising companies were further counseled in accordance with the TGAP to improve their production activities and implement the production and sales record system.

## **3. Comprehensive medical services and system to build a healthy and vibrant society**

An excellent medical system serves as the basis for a healthy and vibrant society, therefore, the Department of Health (DOH) announced or amended several medical systems, organized seminars and participated in international events, including:

- (1) Amended the Cautionary Items for Medical Service Institutes Handling Prevention Health-care Services: assisted the economically poor group (low-income, middle-low income, households in remote areas) with one time examination of Group B Streptococcus, free or subsidized genetic service for birth related items; genetic counseling and assistance provided for newborns with genetic abnormalities, and transference of treatment is also available.
- (2) Promoted Inoculation and Follow-up for Students Entering Kindergarten/Daycare Center Plan: provide early prevention and follow-up for young infants to complete their inoculations and to enhance their overall immunity.
- (3) Organized Cancer Screening (Treatment) Standard Seminar, International Seminar on Cancer Passport Quality and Evaluation, Cancer Treatment Excellence Award for Hospitals and Experience Exchange Seminars, etc.
- (4) Organized the Health 2011: Come on All Grandfathers and Grandmothers – National Finals in conjunction with the Double Ninth Festival and the International Day of Older Persons.
- (5) Led scholars and experts from Chiayi City and Taoyuan County in attending the WHO Elderly-Friendly Cities Network, International Elderly League, and attended

the 1st International Symposium on Elderly Friendly City held in Dublin, Ireland. The symposium discussed how to construct elderly friendly cities and operations of the network in the future. The Taiwanese delegation signed the historic Dublin Declaration, which focused on continued support for the elderly, with 42 international cities.

### 4. Welfare for the disadvantaged

- (1) The Ministry of the Interior formulated the Infant Education and Care Act, and all 60 articles were announced by the President on 29 June 2011, and will enter into effect on 1 January 2012. The aforementioned act integrated all education and welfare matters pertaining to child care, and the integration of child care services.
- (2) Amended table 2 of article 5: Guidelines for Immediate Care and Emergency Aid, including: (a) Conditions for determining primary caregiver is changed from the original greater than 1/2 of total family income to greater than 1/3 of total family income. In addition, the clause for primary caregiver is expanded to include those who are main financial providers and those with no economic income but actually handle the livelihood of the household (one person per household maximum). (b) Expanded subsidy for economically disadvantaged households will include pregnant women who are unfit to work as diagnosed by doctors.



Health 2011 : Come on All Grandfathers and Grandmothers - National Finals

- (3) To widen protection for the disadvantaged, articles of the National Pension Act were amended, including: increasing birth subsidy, loosening pension criteria, loosening conditions for withdrawal of guaranteed elderly funds and for indigenous people, amended charges of payment and calculations of years of service, as well as conditional removal of penalties of spouses. These measures are in place to ensure every citizen can enjoy basic security in their pension.
- (4) Implemented welfare and amended the Public Assistance Act to loosen the standard for the poverty line and evaluation qualifications. Provide 1/2 health insurance subsidy for lower middle income families, as well as waiver for school fees for their children who attend senior high (vocational) schools. The implementation of the new system could help more disadvantaged people.

## 2.9 Education and Promotion Working Group

### 1. Improving knowledge and understanding of sustainable development and environmental consciousness of the general public

To facilitate students' understanding and learning of topics relating to sustainable development, different courses/projects based on education levels were developed, such as: (1) assisted universities in opening 29 courses on sustainable development knowledge; (2) 21 science centers of senior high schools researched on environmental education and provide educational resources concerning sustainable development; (3) promoted Situational Learning Center: Outdoor Learning Promotion Plan to encourage elementary and junior high school students to learn beyond the classroom; (4) promoted website and materials for the Climate Change and Sustainable Development, to provide teaching experiences and exchange of ideas; (5) subsidized civic

organizations in hosting learning schools for the elderly to further sustainable development and environmental consciousness. 400 elderly schools were subsidized in 2011, which benefited more than 50,000 people.

To enhance the public's understanding of ecology, the importance of water resources and energy conservation and carbon reduction, the EPA organized the Protect the Forest and Water of Taiwan environmental event, and the carnival Low-carbon Green Life: Let's Do Our Part for a Better Future. The NSC hosted the Low-carbon Taiwan for a Better Future – You Can, I Can special event. In addition, the key theme of the 460th Science Development of the NSC introduced related concepts of green building to educate the readers concerning its importance and characteristics, as well as to inspire the general public's interest in sustainable development.

The MOEAIDB published 700 copies of the Corporate

Social Responsibility (CSR) Report Guidance and Introduction to Taiwan's Outstanding Examples of CSR Reporting, to encourage corporations to continue their CSR reporting and adherence to integrity in business operations; compiled 1,000 copies of the Stories of Integrity among Taiwan's Corporations.

## **2. Integrating resources from the government, the general public, corporations and schools to further sustainable development**

The EPA organized the Clean Homeland for All Plan and Creating a Sustainable Environment Plan that integrated the green network, township and city mayors, and the EPA (local EPBs) to establish 30,000 government style blogs; promoted the Student Care from Home to School Patrol Plan to encourage students to pay more attention to their surrounding vicinities at school and home, and to patrol the environment, report in and clean when necessary.

The Ministry of the Interior promoted the Community Planning Localization Counseling Plan and ratified formation of counseling groups in 17 counties and cities. Through close proximity, improvements to the environment were carried out, to create an excellent living environment in a balanced harmony. The Ministry of Education organized the 2011 National Environment Education Policy Direction Seminar and assisted 22 county/city governments in implementing the Environment Education Counseling Group Plan. Through hosting of lectures and integration of resources, environmental education plans and strategies were formulated.

## **3. Strengthening community education centers and public media to promote topics of sustainable development and environmental protection**

The Government Information Office and the National Geographic Channel co-filmed the Great Project Tour: Taiwan's EcoARK documentary – which introduced Taiwan's environmentally friendly building technologies, and assisted the EPA in utilizing four wireless TV stations, the Taiwan Indigenous Television and Hakka Television Station in showing 19 short promo files titled Reinvigorating Tamsui River. Meanwhile, Energy Conservation and Carbon Reduction, Use Water Carefully programs were produced at 14 television stations, including Chengsheng Broadcasting Corp., to promote the concepts of energy conservation and carbon reduction.

To preserve information on Taiwan's national park resources, the MOI completed the 2011 National Park

Digital Archives Program, which encompassed 1,380GB of digital information, videos of interviews with 52 experts, 100 minutes of previous videos and newspaper information.

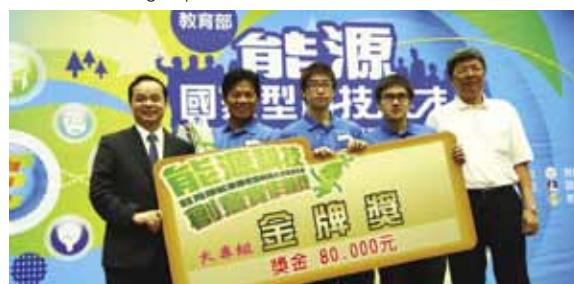
The Water Resources Agency utilized related media or promotional events to help spread the idea of sustainable water usage, for instance through a 12 minute promotional film, 2 eight minutes promotional films: The Day After Climate Change and 2884mm, 30 second promotional short films, media broadcasts and advertisements, and various brochures.

## **4. Promoting sustainable development education and international cooperation**

Sustainable development education research subsidized by the NSC includes: Sustainable Campus Program: Research on Raising Teachers and Students' Quality, Integrated Research Plan on Supporting Community Sustainable Development of Natural and Environmental Education Resources, Research on the Economic Impact of Global Warming and Integration of Economics in Environmental Education, Design and Evaluation of Environmental Courses, Research on Professionalism of Kindergarten Teachers in Areas of Sustainable Environment Education in the New Century, etc. The Ministry of Education subsidized the hosting of 4 seminars and 4 international seminars by the Society of Wilderness to encourage government agencies, educational institutes, civic association and foundations in organizing more environment education related events.



↑ President Ma Ying-jeou in attending exhibition with students of the hearing impaired



↑ Deputy Minister Wu of the Ministry of Education awarding gold medal of the energy technology innovation contest for university-level students



# Evaluation of Taiwan's Sustainability Indicators in 2010

Sustainable development has always been a key theme for discussion. To ensure a subjective reference for all circles concerning the evaluation of the nation's sustainable development, in 2002, the NCSD referred to the 1996 sustainable development indicator system of the United Nations (UN) as a measure to develop the country's own sustainability indicators. The sustainable development indicator system was established in May 2003. In addition, computation results of the indicators will be published on the NCSD's website annually as valuable reference to all parties. (Website: <http://sta.epa.gov.tw/nsdn/CH/DEVELOPMENT/INDEX.HTM>)

The UN announced the third version of the sustainable development indicator system in October 2007. In order to stay on track with international trends, the NCSD resolved to amend Taiwan's sustainable development indicator system on December 2008. After more than one year of deliberation and symposiums, at the 29th working meeting of the NCSD on 31 December 2009, the second version of Taiwan's sustainable development indicator system was passed.

The second version of the sustainable development indicator system in 2010 included 12 themes, 41 sub-themes (see table 3-1) and 87 indicators, which is considerably more encompassing than the first version.

Evaluation data for the 2010 sustainable indicators can be downloaded from the aforementioned website.

**Table 3-1 Themes and sub-themes of the second version of Taiwan's sustainable development indicator system**

Theme	Sub-theme
Environment	Air quality, water quality, waste, environmental management
Energy Conservation and Carbon Reduction	Greenhouse gas, energy usage, energy conservation and carbon reduction
National Land resources	Land, forest, coast, water resource, natural disaster
Biodiversity	Heredity, species, terrestrial ecosystem, marine system
Production	Material usage, hygiene production, agriculture, fishery, labor, overall economic effectiveness, public finance
Livelihood	Water usage, transportation, green consumption
Technology	R&D, telecommunications
Rural culture	Heritage, community, city
Health	Medical care, nutrition, health risk
Welfare	Poverty, average income, social benefits
Administration	Crime, education
Participation	International participation, public participation

The screenshot shows the website interface for the National Council for Sustainable Development Network. At the top, it reads '行政院國家永續發展委員會全球資訊網' and 'National Council for Sustainable Development Network'. Below this is a navigation menu with options like '本會介紹', '本會相關會議決議', '永續發展指標', etc. The main content area features a large green banner with the title '永續發展指標系統年度評量結果' (Annual Evaluation Results of the Sustainable Development Indicator System). Below the banner, the years 2009, 2008, 2007, 2006, 2005, 2004, and 2003 are listed as clickable links. The background of the website features various nature-related images like flowers and landscapes.

Diagram 3-1 Website of the sustainable development indicator system

# 2011 National Sustainable Development Award Recipients

## Sustainable School Award

### Micang Elementary School of Bali District, New Taipei City

Micang Elementary School of Bali District of New Taipei City, was established in 1922, located near the Dabengkeng, Shishanhang cultural remnants and Guanyinshan National Scenic Area. This wonderful setting granted this school an excellent educational environment. For more than 90 years, the students here were taught the values of health, gratitude, friendship and excellence. In recent years, the school aimed to create a haven for students to mature happily, for teachers to develop professionally, and to become the center for nurturing a community. The school's environment and community resources, coupled with unique local characteristics, are utilized to develop various learning activities and nurture the school as a key learning center and cultural hub for the entire community.

To ensure that the school is in sync with sustainable

development, aspects such as space management, sustainable development education, practical items in environmental protection, human welfare and community participation were incorporated in the school's curriculum, students' learning and physical resources. The ultimate objective is to develop diversified, localized, expanding and sustainable education and value.

#### Revitalization and Reuse of Space

Established a campus environment management system and inspected campus geological environment; integrated with Guanyinshan National Scenic Area, an environmentally friendly campus was planned and beautified. Further, analysis of space utilization frequency and efficiency were used to construct accommodations, and the Bali stone industry and ecological resources were



Micang Elementary School Happy Farm





- 1 Integrate community resources to let students experience their hometown industry—the process of gathering bamboo shoots
- 2 Water plant pool displays campus wetland ecology and provides students with the natural learning environment needed to explore nature
- 3 Using local materials and preserving nature through a sustainable and environmental friendly method of building

integrated to establish teaching zones of carving, plating, observation, experience, exploration and amusement and to provide a sustainable learning environment.

Micang Elementary School explored locally as it began the journey of promoting sustainable learning. Caring for the environment was a key foundation as it sought to develop its own courses and encouraged teachers to compile their own sustainable gardening book that can utilize environment based materials or incorporate lessons in teaching, such as using wind powered generators to explain renewable energy, building trails that teach about plants, water plants, Micang tree house, learning farms, etc. In addition, environment related outdoor teaching, attending lectures, seminars and environmental-related contents also serve to contribute to the purpose of developing sustainable teaching.

### **A Life of Environmental Protection**

Environmental protection should be part of daily lives, done through measures such as waste reduction, resource recycling (including recycling textbooks, uniforms, cupboards, ordinary items, fallen leaves, waste food, floating logs and electric cables, etc.), paperless office, etc. Also, promotion of green consumption, green transport and development of renewable energy, collection and reuse of rain water and utilization of water and energy-saving appliances are encouraged.

### **Integrate Humanities and Community Participation**

Impromptu community beach cleanings, on-site investigations of humanities records, and donation of second-hand books and toys, etc. are just some of the ways to utilize school resources combined with local resources. These measures help establish a library for environmental education, magazines and information

system, compilation of Micang Environmental Education Library and Sustainable Campus Network. In addition, creative teaching and community resources, such as community facilities and ecological park, maritime education using canoes and sails, wetland education of Tamsui River's intertidal zones, trail of Guanyinshan, Bali local education, etc., were integrated to create the unique teaching flair of the school.

### **Play while Learning, Learn while Playing**

Through exploration of experiential learning, every student can adjust and adapt in a stress-free happy learning environment, which aids in building their confidence. Through a subtle transformation caused by the shift in environment, and the natural learning spaces within the campus, all students get in touch with the land, develop their physique, look after their character, experience the harmony between man and nature, and in turn learn to respect life and love Mother Earth.

Through long-term efforts and dedication, coupled with integration of Bali District's local industries and humanities, the area is gradually developing into a learning zone of humanities, nature, environment and education that provides learning, observing and experiencing avenues; localized own courses are promoted at inter-school events which foster the diversified facets and teaching styles that further enhanced students' learning opportunities; through efficient utilization of campus space and provision of sharing platform through integrating the school's and community's resources, the school is transformed into a community learning center; flexible use of education methods foster the students' appreciation of the relationship between man and environment, which further the knowledge, attitude, skills and values needed to make changes and respond to our environment.



## Stella Matutina Girls' High School of Taichung City

Stella Matutina Girls' High School (SMGSH) was founded by the Sisters of the Sacred Heart of Mary in 1963; during that period, it was difficult for females to receive education. Therefore to nurture talents and raise the status of females, the Sisters of the Sacred Heart of Mary overcame all obstacles and utilized their resources to buy a piece of land at Daya Rd. of Taichung City as the building ground for the upcoming school. Early in 1985, when environmental consciousness was growing, the SMGSH was led by Mr. Chen Dao-xue (Gentlemen of Waste). Under his guidance, the students experienced full-scale environmental education through learning how to classify garbage and recycle resources. In recent years, steps were taken to educate students about ecology, implementing ways to conserve energy and reduce carbon, and to further exemplify a simplified lifestyle, so students can internalize gratitude and appreciate life. This dual-method of cleanliness for the environment and heart made education at the school even more desirable.

### Green Campus

People were astounded by the first impressions of the school: campus landscape design inspired by religion and love for the environment. A garden for every building demonstrated a plethora of flora, bringing out the beauty of the campus four seasons throughout the year. The ecological pool and honey source ecological teaching zones help teachers and students observe and learn about common birds, insects and plants on the campus. The delicate guests of the campus, such as flapping butterflies, crawling caterpillars, tendering pycnonotus sinensis, playful sparrows, serene sounds of insects and birds, all allow the children to experience a different kind



Campus landscape design that integrates religion and care for the environment



↑ Campus ecology tour: Teaching from the heart, learning from the heart

of soul nourishment. The SMGSH adopted green building concepts to create a bio-diversified campus environment that conserves energy, resources, and is healthy and safe with zero pollution. In addition, hanging gardens, ecological pools, butterfly ecology, Lanyu plants zone and multi-level planting facilities were established on the campus.

### Multi-faceted Environmental Education

Develop education-centered sustainable development courses by integrating local culture and ecology; conduct learning activities based on practical experiences; simultaneously organize varied sustainable professional development activities for the principal, administrators and teachers; establish sustainable education professional development association. To implement diversified environmental education, sustainable development topics related to Taiwan's environment and global climate change are integrated into teaching and learning activities such as bio-diversity, ecological conservation, environmental pollution and load, climate change, Kyoto Protocol, renewable energy, non-nuclear home, globalization, industrial culture, green consumption, genetic engineering, environmental justice, value education, etc.;

Through diversified activities, the concept of sustainable development can be nurtured in the teachers and students.

### **An Environmentally Friendly Life of Energy Conservation and Carbon Reduction**

Energy conservation and carbon reduction are a key part of the promotion for environment protection. To achieve this end, the SMGSH conducted full-scale evaluation of power and water usage and used light-saving bulbs and rechargeable batteries, to truly achieve energy and water conservation goals. The Green Living Club was formed to allow members to learn, service, research, implement and promote low-carbon energy-saving green lifestyle.

In addition, to promote the treasuring of water resources, rain water and recycled water were collected and reused, and water-conservation equipment were used. Textbooks, uniforms, and school items were collected and recycled, and waste reduction and recycling on campus were implemented. In addition, starting five years ago, disposable utensils were banned on campus and lunch meals were provided, co-ops were closed and vending machines removed, resulting in an annual reduction of 6,000 kg of disposable utensils.

Coupled with Veggie Fridays, the children were more healthy and the environment protected.

### **Environmental Protection Slogan No More – Care for the Planet and Community**

The annual Prayer for the World event targets international incidents and environmental issues. With aid from related science teachers, live introspection and prayer rituals were conducted to remind the children about the inter-connectedness of all life forms and the environment. In addition, the SMGSH continues to participate and solve environmental problems, strengthen community environmental consciousness, develop community vision and integrate environmental protection concepts into daily lives. Under the pretext of this ideal, the school not only helps nurture a robust mutual-help system between the families and the community, but further develop happy, grateful, respectful and positive life values in the students. Furthermore, care for the disadvantaged, assistance to the disadvantaged groups such as providing care for lone elders, collection of donations, and integration of borderline community resources to develop local character all serve to develop the SMGSH as an education base for sustainable development of the local community and local industry.

1 Year-end cleaning for lone elders – environmental education integrated with human concerns

2 Waste water treatment plant: Learning the importance of water resource reuse



## **Ci-Xin Waldorf School of Yilan County**

Ci-Xin Waldorf School embodies a healthy and balanced way to pursue the three-faceted growth of will, emotions and thoughts in children. The school integrates mind-engaging arts, handiworks, body movements and music courses side-by-side with sturdy language, arithmetic, science and sociology courses; this combination nurtures and encourages balanced development of the mind, heart and body of the children. It is hoped that as the children understand their own potential and are equipped with free will, they will step into the future with confidence and contribute their talents

for a better world.

### **Sustainable Ideas and Values**

Waldorf's education ideal is to pursue a healthy and balanced development between man and self, man and community, man and land, and man and heaven and earth, as well as to lead children into a positive cycle of sustainable development. To this end, education promotional courses, teachers' development courses, parents' growth courses, parents' study group, parents' workshop, are all geared toward emphasis on the nature



↑ Organic green buildings that focus on education

of education and introspection on life's growth so as to better know the world.

### **Sustainable Teaching and Campus**

Teaching shouldn't involve formulated texts, but rather should be based upon the natural rhythmic characteristics of life. Stories and pictures play the central role as teachers employ them in generating creativity, and students respond in a positive sustainable learning cycle of absorbing, digesting, pondering and performing. As far ago as eleven years, Waldorf participated in the Taiwan Sustainable Campus Project of the Ministry of Education, and began: (1) sound, light, heating and energy conservation improvements; (2) multi-layered greenification of campus; (3) circulation of natural pure water in artificial wetlands; (4) creating local diversified campus ecology and water-permeable campus space. For more than a decade, Waldorf had pioneered sustainable campus ideals and plans and aided over ten schools in Yilan County.

### **Sustainable Building and Localization**

Nature is our teacher. New classrooms and students' activity centers were constructed using the green building concepts – a joint effort by teachers and students as they seek to bring life to buildings and power that transcends space. Their efforts brought a new outlook to the sustainable development of buildings in Taiwan's campuses. At the same time, based on the ideals of localization, nature and environmental protection, families, schools and communities are integrated with local farms to realize friendly farming and green consumption. The Big House Friendly Market was formed that allows sustainable development of local farms. The professional teachers and parents dedicated themselves to community works, edited human resource maps and promoted local culture, environmental courses and student community public services. All these measures helped invigorate the community.



↑ Promoting local foods and friendly farming: Big House Friendly Market

### **Sustainable Community and Happiness**

The Parents' Association (PA) is made up of 12 working groups. The PA participated in school affairs, moulds a community culture that transcends space and blood, crosses the border of modern society and rebuilds the cooperative trust between people. Most parents, after participating in the PA, experienced life-changing joy and growth. Raising their children became a source of joy, not a burden, for the families, even after many years and the birth of their second or third child. Many families even had their fourth babies, a monumental achievement in the face of the country's low birth rate.

### **Sustainable Food, Clothing, City and Countryside**

The school dedicated itself to promoting simple clothing made from natural materials, and encouraging a natural diet. For many years, catered lunches have provided the simple diets made from organic and natural foods, giving the children a source of vibrant energy. The diet also supports energy conservation, carbon reduction and environmentally friendly agriculture. The school has become a learning ground on how to be a public citizen, injected with arts on living, including local food friendly markets, organic interactive farm, and organic ecological community. These attract large numbers of people from other counties who seek education, and caused a wave of urban/rural transformation due to the education industry.

### **Creating a New Mind for the Environment**

Waldorf had always been a seed for building a healthy community through joint participation from teachers, parents, students and the community pertaining to educational affairs, as well as fostering a new image for schools so that schools can become a learning ground that develops citizen consciousness. The teaching team emphasizes the subjectivity of education and hopes to forge the connectedness between people through school education, overcome barriers of modern society and





Bamboo raft built by students as they experience the wetlands

build a new culture based on community interaction. In the future, Waldorf hopes to become a leader in the art of living, building a bridge between educational reform and social progress and acting as the strength and hope as society evolves in a positive way. The school's education

also injects new ideals into the society and helps in the remodeling of urban and rural areas. Further, through implementation of education, the ideals embedded into local natural ecology and humanities, serve as factors that shape the new local education industry.

## Sustainable Enterprise Award

### Singtex Industrial Co., Ltd.

Since the establishment of Singtex Industrial Co., Ltd in 1989, ideology of the company had shifted from selling functional textiles to realizing the impact of steep climate change on the world's environment and man's need for survival. The realization that there is only one Earth that requires the joint efforts of everyone propelled Singtex to spend billions of dollars to create a cutting-edge R&D Center and high precision environmental protection dyeing R&D Center. These measures shifted Singtex's focus and made it a champion supplier as Singtex aimed to become the international leader in providing environmentally friendly functional textiles. In recent years, Singtex won acclamations from the country; in addition to winning Taiwan Excellence awards two years in a row, this year Singtex also won the honor of being among Taiwan's top one hundred brands for the Centennial. These acclaims all deepen Singtex's resolve on the road to sustainable environmental management.

#### Environmental Protection

The ideal that Singtex has always been striving for is not just to satisfy people's needs for the functionality of their clothes, but also to conserve our environment and co-exist with nature's ecology. Singtex uses innovation as a means to response to changing times, new technologies to support our innovative ideas and establishing the environmental friendly image and branding of functional textiles. Singtex's corporate image is one of excellence, dedicated to creating high-functional, high-value and environmentally friendly functional textiles. Equipped with the EHS (Environment, Health, Safety) ideal, Singtex strides

into the international arena and introduced Taiwan's functional textiles to the international arena, building a strong brand image.

#### Continue Innovation

Singtex spent four years developing the S.Café® environmentally friendly coffee muslin. The muslin integrates waste coffee grounds with recycled PET bottles. The S.Café® environmental friendly coffee muslin and ICE-CAFÉ energy conservation environmentally friendly ice coffee muslin are made of environmentally friendly materials. In addition to odor removing functions, they reduce the number of rinses in washing machines, hence reducing energy consumption. At the same time, the series also passed the GRS (Global Recycle Standard) and German's TUV recycled material certification. These innovative products won acclamations from Pittsburgh Innovation and Nuremburg's IENA, International "Ideas – Inventions – New products" Trade Fair. The company



Received acclamation from the Taipei City Government in promoting Veggie Day



↑ Singtex rice field



↑ Received the Environmental Hero Award given by Commonwealth Magazine

invests more than 3.5% of revenue in the R&D of functional textiles annually. Singtex hopes that through active innovation and incessant improvement of Taiwan's textile industry, competitiveness can be maintained and long-term relationships with international clients can be nurtured.

### **Comprehensive Environmentally Friendly Manufacturing Procedures**

\$NT250 million was invested in 2007 to establish the high precision environmentally friendly Dyeing R&D Center. Environmentally friendly concepts were introduced into the center design at the initial phase, from selection of energy source to dye selection, all are compliant with environmental protection standards, and received the bluesign® certification as well.

1. Utilized natural gas as the heat source for the plant, so as to reduce reliance on heavy oil which produces greenhouse gas.
2. Install heat recycling systems at heating devices with an effective recycling rate of 40% and helped reduce heat loss.
3. Selection of dye: selected dyes that are harmless to the human body and the environment; selected dyes that passed the bluesign® standards.

Besides constantly improving the manufacturing

process, Singtex also devotes itself to reducing energy consumption and carbon footprints for its products, guided by the corporate mission of protecting the Earth's environment.

### **Actively Develop Talents**

The Singtex Academy was established in 2003 and acted as an internal training organization for the company. Courses are varied, with company managers and outside experts acting as speakers for the courses. Employees learn different courses based on their work designation and receive credits when they pass. These credits serve as reference for future promotions and motivate employees to keep learning. In addition to learning, attention on body-mind-soul development is also emphasized through a health center and different kinds of clubs and activities.

In recent years, Singtex has cooperative plans with various educational institutes across the country. Annually, 4 to 6 internships are available to students of textile related departments. Since 2011, Singtex has allied with the International Foundation of Fashion Technology Institutes (IFFTI) and provide internships for international students to study in Taiwan. This development of young talents helps pave the career path for aspiring students.

### **Implementing Energy Conservation and Carbon Reduction from the Heart**

Besides using R&D capabilities in improving manufacturing processes and products, the employees of Singtex are encouraged to carry out environmental protection in their daily lives, through participating in plastic bottle and coffee grounds recycling; using environmentally friendly utensils and vegetables; encouraging resource recycling through waste reduction and classification. Singtex adopted 0.5 hectares of rice fields in Dongshan Township of Yilan County in 2011 as a token of genuine concern for our land.

Looking into the future, Singtex will continue in its endeavors to be friendly to the environment, developing various environmentally friendly functional textiles to provide comfort and value to consumers; employing passion, integrity, innovation, service, quality and giving back as our core values and ideals; becoming the top leader in providing environmentally friendly functional textiles; satisfying the needs of stakeholders and employees; and achieving sustainable operations and growth in accordance with the company's core values and ideals.

## United Microelectronics Corporation

The United Microelectronics Corporation (UMC) was established in 1980 and is the world leader in semiconductor related technology with 10 foundries and operation sites across the globe. For more than 30 years, UMC had utilized flexible operational strategies, cutting-edge manufacturing technologies, innovative capabilities, customer-centeredness and green product service abilities to propel the company as the world's leader in semiconductors. It furthered Taiwan's lead in the semiconductor industry across the globe. UMC is the leading company in terms of patent numbers and continues to advance state-of-the-art manufacturing processes that encompasses every sector of the semiconductor industry. UMC was the first foundry to ship wafers using copper materials, to produce chips on 300mm wafers, to deliver functional 65-nanometer ICs to its customers, and the first to produce chips using 28-nanometer process technology.

The realization of sustainable development and social responsibility is the underlying core principle of UMC. As a global leader in the semiconductor business, not only is CSR implemented in the business, but UMC further strives to spread the idea of sustainable development, beginning from the company, employees, family members, to every corner of society. Since 2008, UMC was listed for both the DJSI-World and DJSI-Asia Pacific indexes, a testament to UMC's sustainable global competitiveness.

Ten unique features of sustainable development in UMC

include:

### **1. First in the semiconductor industry to promote CSR and Establishing a CSR Committee**

UMC Corporate Social Responsibility (CSR) Committee was formed in 2008 and presided over by the chief executive officer, who regularly inspects and acts to improve CSR performance. The CEO proclaims the CSR vision, which is to "Establish a new vision of a people-centered, environmentally friendly and prosperous society". The vision guides UMC in achieving a triple win for the economy, environment and society.

### **2. Healthy financial structure and company management**

The financial structure of the UMC is balanced and has high cash-flow, low debt and a comprehensive cost control plan. UMC was the first to recover from the financial crisis of 2008. The year 2010 had been especially promising, with record highs in both export volume and revenue; profit margin and stakeholders' returns had reached excellent levels as well. More than half of the board consisted of independent persons. Further, the presence of Auditing Committee, Salary Committee and Information Disclosure Committee, coupled with the promotion of the Sarbanes-Oxley Act all helped improve ethical standards and protect stakeholders' interests.



Installing solar power panels





⤴ Love story action theater



⤴ Story-telling volunteers

### **3. Invest in green industry for a low-carbon and sustainable future**

The New Career Development Center was established to invest in green industries such as renewable energies, solar power and new-generation LED lighting. As of 2010, more than NT\$12.8 billion was invested. The strong dedication to R&D formed the unwavering backbone of UMC in applying breakthrough green technologies in ushering forth revolutionary leaps, which indirectly propelled the economic restructuring toward a low-carbon economy.

### **4. The leader in announcing climate change policies**

UMC led its industry by announcing Climate Change Policies and Carbon Reduction 333 Plans. These plans advocate innovative low-carbon measures, provide low-carbon solutions, and serve as evidence of UMC's commitment to implementing measures to lower carbon emissions and respond to the world's climate crisis. The daring moves and responsible actions therefore won the acclamation of Commonwealth Magazine's Environmental Hero Award.

### **5. The industry's first in carbon and water footprint certification – ushering a new era of green products**

UMC has been SONY's Green Partner since 2003. A hazardous substance management system was established in 2006, which controls over 40 listed substances, and surpassed even the RoHS directive of the European Union. In 2009 and 2010, the UMC became the first company in the industry to receive dual certification of carbon and water footprints, as well as receiving the Type Three Certification of Environmental Product Declaration (EDP). These ensure that UMC's IC customer products are environmental friendly, toxic-free and low-carbon.

### **6. Low-carbon Alliances: Inviting supply chains in bearing carbon reduction responsibilities**

The CSR Declaration was signed with UMC's suppliers in 2008 as a gesture of acknowledgement of the ideal of "care for employees, care for the environment and realize public welfare". Presently, the focus is on supply chain carbon partners. UMC's own greenhouse gas management and carbon footprint evaluation foundation helped lead the way for suppliers to conduct their own carbon footprint inspections, and together build a low-carbon supply chain.

### **7. The only company to have a technological cooperation agreement with the EU, thereby removing barriers to green trade**

UMC participated in the FP7 of the EU and became the first official participant of the EU-FP7 in the industry. This plan involves collaboration with other nations' industries and academia in researching a simple tool to calculate carbon footprints. This tool will help popularize the carbon footprint concepts among SMEs and introduce Taiwan's experiences to the EU, hence lowering potential barriers for green trade for Taiwan companies.

### **8. High-tech fire rescue team**

The UMC fire brigade was formed in 1999 and was responsible for major emergencies. The fire brigade was equipped with state-of-the-art equipment such as high-performance chemical fire trucks, IR thermal-image helmets, chemical blockage modules, and personnel life-saving equipment. This equipment allows the brigade to respond immediately and minimize risk. Besides off-foundry rescues, the team also participates in government-based large-scale drills and exercises, assists disaster relief and other emergency response.

Announcing climate change policies



### 9. Creating a healthy working environment for employees

UMC treats its employees as valuable business partners, and therefore dedicates efforts in nurturing talents and offering career development plans. Through creating a golden healthy workplace, provision of varied and competitive compensations, measures were in place to assist partners in creating a balanced life of work and leisure. In particular, the creation of friendly workplace focuses on six aspects: safety, warmth, health, synergy, vitality and culture. In 2011, UMC won the CSR: Healthy Workplace Model Award of Commonwealth Magazine.

### 10. Seeds of hope through education

UMC employs the LOHAS concept to promote social participation; by 2005, the Spreading the Seeds of Hope Plan had thus far invested NT\$120 million in helping 5,000 disadvantaged students in their schooling. From 2010 onward, educational focus has been divided into five aspects: hope seed, life education volunteer seed, reading seed, environmental friendly green energy seed and semiconductor seed. These efforts demonstrate the dedication of Taiwan's corporations in helping education.

In 2011, UMC once again received the National Sustainable Development Award, and is the first company to receive the award twice. This recognition will be UMC's support on the road to constant improvement and progress. UMC is not just a semiconductor giant, but also a helper in promoting a sustainable society. UMC will continue to be actively engaged in various sustainable issues, and generously share its experiences with other corporations, supply chain partners, employees and society at large. It is hoped that through corporate power, the idea of sustainability is spread to every corner of society.

## TOPPAN CFI ( TAIWAN ) CO., LTD.

Taiwan's Toppan CFI was established in 2001, as Japanese Toppan Printing's first overseas color filter manufacturing company. AUO invested in Toppan CFI in 2006 and the two companies became business partners. The solid relationship, business management, and outstanding technological service give promising signs and steady growth to the company, allowing Toppan CFI to become Taiwan's first and best color filter manufacturing company.

In recent years, much has been invested in state-of-the-art R&D; coupled with technology visits and exchanges with Toppan Printing and AUO, much had been accomplished in terms of numerous panel coating, vacuum sputtering, film thickness control, photomasking design and manufacturing, color light adjustment and large area picture control technologies. Simultaneously, through industry/academia cooperation, soft coating and film, Polymer Light Emitting Device (PLED) technology and high-level water moisture resistant membrane manufacturing technology were advanced. Through mutual learning of the industry and academia, it is hoped that Taiwan's technology and industries could be sustainably developed, and help advance the field of colored filters, explore new markets, and strengthen

competitiveness through sustainable management.

Special projects dedicated to all aspects of sustainable development will be in place, with focus on technology R&D, employee relationships, environmental protection, energy conservation, and social welfare. It is hoped through the process of planning, executing and improving, the hearts and actions of all company management and employees will be united as one; hopefully this will reflect on the business as well. Other achievements in terms of promoting sustainability include:

### Excellent results in carbon reduction

Greenhouse gas inspection was in place from 2009 onward, in an effort to understand greenhouse gas emission volumes at all stages of the manufacturing process. Standards were then used as references for future deductions. The president of the company convened a green performance meeting in 2010 and commenced green innovation, green procurement, green transport, green manufacturing and green consciousness as items of inspection during business operations. Actual figures in 2010 stated that greenhouse gas emission volume decreased by 30% compared to 2009, and water volume consumption decreased by 42%. As of the end of 2010,

the company became the first corporation in the nation to receive carbon and water footprint certifications, a significant landmark achievement indeed.

### **Promoting culture and public welfare events**

Revenue grew by 40% in 2010. The largest growth was among the Chinese clientele. In terms of employee relationships, local employees consist of 83% of the workforce. More and more budget resources were dedicated to professional, soft skills and educational training for employees, with an annually growing budget. Mail and emails were used to gather feedback from employees; regular communication meetings and satisfaction surveys were conducted to ensure smooth communication channels. Health seminars and sports activities were occasionally held to promote employee



Virtual Toppan CFI Elementary School graduation ceremony

health.

The company is located near Taijiang National Park in the Southern Taiwan Science Park (STSP). The company utilized this unique natural environment to promote sustainable development, through regular hosting of beach cleaning and homeland cleaning event for the Black-faced Spoonbill (*platalea minor*). In addition, the elementary school ecology and environment team provide interaction with the local environment. Through cooperation with the surrounding government agencies, schools and communities, efforts are dedicated to public welfare activities. In particular, the virtual Toppan CFI Elementary School education event is of significance.

### **Toward an innovative green company**

Toppan CFI aims to be the leading provider of innovative green technology in the field of color filters, providing customers with varied application products and technologies. Utilizing the latest technology of TFT-LCD, its high saturation, contrast and resolution provide research foundation for creating niche products. Simultaneously, the successful development of the super high aperture ratio and glass thinning technology, glass raw material usage is reduced and waste treatment cost saved; it also reduced energy consumption for end products. In addition, the state of technology for all is accomplished through the development of a soft functional membrane that not only can be utilized in the panel industry, but also



Revealing of new corporation identification system



Production line of color filters



as membranes in daily lives. To improve work efficiency, the company employs an automatic system to provide accurate information at the production line, lower manual operation, and through instant feedback any immediate

abnormalities can be treated instantly.

### Care for the society as our core value in the promotion of sustainable development

Care for the society is part of the core foundation of the company's business operation. TOPPAN CFI will continue to support sustainable development and fulfill its social responsibilities. In this challenging environment, the company will continue dialogues with stakeholders and pursue growth and improvement, to achieve the ultimate purpose of sustainable development for both the corporation and environment. A touch of color for life.

## Sustainable NGO Award

### Children Are Us Foundation

Two percent of the world population are fallen angels, born without dignity and joy, often hidden at dark corners of the society, sobbing, crying by themselves. The world lends her compassion and grief to these borderline people, but does not know how to help them out of their misery. Due to their disabilities, the dignity and joy of life are just beyond their reach. In 1995, a group of parents in Kaohsiung formed the Children Are Us Foundation, as an avenue to provide life-long education for these disabled children. The mission is to provide them with the dignity and joy that life has to offer, and to allow them to find value in work, give back to the society, fill in life's void and obtain sustainable care.

#### Sustainable value of life

The Foundation has 27 baking houses, restaurants and a central workplace that trains and nurtures disabled children. The children create their social and economic value from the work they do, transforming them from resource consumers to resource creators; from the served to the server. They regain their life value and live a happy, fulfilling life with no regrets. From their work, the children also learned dignity and joy.

#### Sustainable life education

The success story of the disabled children has been incorporated in the Chinese textbooks of the fifth and sixth grade of elementary schools. The Aguo cousin lesson from Nani Publishing and The Spring of Disabled Children from Kang Hsuan Publishing teach our children how to be



Elementary textbook— The Spring of the Disabled Children

strong, for even the disabled children can do it! Life will not be handicapped because of our physical limitations, for out of adversities comes life's most beautiful blossoms.

#### Sustainable help for others

With full appreciation of the Foundation's humble beginning and current strength, it is necessary to help others to do the same. Upon learning that there's no bakery within a 15km radius in remote area schools, with kids having no ample meals, the Love to the Tribe activity was launched at the end of 2008. One love, two touching moments. All meal boxes were made manually by the disabled children and given to the tribal children. This activity continues to this day and is handed by the one and only disabled scout group, which consists solely of the disabled children.

#### Sustainable learning environment

The Foundation established the Happy Farm and Wizard of Oz Coffee House for the long-term care of the children. The farm is located at Qishan District, centered around the



👤 Baking by disabled children

Integration of Senses theme. All plants or landscapes are related to sight, hearing, scent, taste and touch, mainly to stimulate the five senses of the children. Herbs are the principal crops, for they provide the necessary spices for the bakery and meals of the Foundation. The Wizard of Oz Coffee House is located on land owned by Kaohsiung City Government. It is leased to the Foundation to host mid- and large-scale events. The Farm and Coffee House both won the Learning Environment Center Award given by the Ministry of Education in 2009, making them ideal for promoting off-campus events.

### Sustainable responsible host

Even disabled children can become hosts? This is unbelievable, but it is true that after sufficient training, these wonderful children are transformed from being shy and timid, to daring to take up any tasks required in the house; from the lowest level in Maslow's hierarchy of needs, to self-actualization; from followers or assistants to hosts. These phenomena keep showing up at the



👤 Love to the Tribe activity

Foundation. The Jianzhong model of Hsinchu inspires a new page in history for the children, and therefore won us the Job Re-design gold award by the Council of Labor Affairs; the Kaohsiung creative cuisine shop is currently handled by five disabled children, each responsible for steaming, cooking, frying, roasting and sushi-making; their serious attitude touches the heart of every person. To date, 23 cuisine, bakery or service certificates had been secured by the disabled children of the Foundation, thereby realizing our goal that even these children can make a place for themselves in the society.

### Sustainable dream come true

The Foundation changed the lives of the disabled children, providing comprehensive care through the four stages of their lives; Birth: from the baking house, community homeland to the learning academies, there are now 44 sites across the country, taking care of over 500 disabled children; Old age: when the disabled children are of ripe age, the swan care home will be officially initiated; Sickness and pain: these are serious issues that needed to be addressed by the Foundation as well. The Kaohsiung Health Center, completed in 2011, provides numerous facilities that involve the physical, perceptual and sensory aspects are used to enhance the health of these children. The medical system for the disabled are currently work in progress and we hope that soon a comprehensive care system for these children will be in place, thereby providing a light to their lives. As the Buddhist writing Vimalakiirti-nirdeza-suutra says: "A single lamp lights up hundreds and thousands of other lamps; light prevails, and is never-ending."



👤 Taking up the role of a love scout

## Execution of Sustainable Development Action Plan Award

### Southern Taiwan Science Park: Sustainable Environment Green Park Promotion Plan

Around 4,800 years ago, starting from Dabengkeng Culture, in this incredible land that possesses enormous potential, our forefathers were born and raised. Today, the Southern Taiwan Science Park (STSP) is the ground for cutting-edge technology and bearer of the historical burden of popularizing the land. The STSP ponders over the relationship between park management and the environment, and thus the Sustainable Environment Green Park Promotion Plan was born.

#### Low-carbon green science park – creating a hub for green energy technologies

Achievements include:

1. Revenue for green industries in the year 2010 amounts to NT\$48.2 billion, nearly 20% of the national green industry value.
2. Organized green industry courses and conducted full-scale talent development; 442 hours of courses were taught with 1,341 attendances in the trainings.
3. Promoted water saving counseling, with an annual savings of 25.24 million tonnes, which is nearly one-quarters of the volume of Nanhua Reservoir.
4. Through autonomous energy savings and carbon reductions, an estimated 11,066 tonnes of carbon emissions were reduced annually.
5. Organized park shuttle services and provided seamless integration with the HSR. As of the end of May 2011, more than 180,000 trips were shuttled, generating an estimated 449 tonnes of carbon reduction.
6. Five green building EEWB Diamond level certificates were awarded to the park, nearly 30% of national total, making STSP the most concentrated park with the EEWB Diamond level certifications in Taiwan.
7. Thirty-two cases of international green standards certifications within the park.

#### Sustainable and healthy science park – reasonable use of land to create a sustainable tech park

Achievements include:

1. Greenification area is nearly 42.4% of the total land area, which is significantly higher than any industrial park.
2. Completed comprehensive drainage system that can



↑ Park development integrated with local culture

counter major floods; survived the challenge of Typhoon Moracot and reduced damage to properties by about NT\$2.1 billion.

3. Implemented pollution volume control and developed in accordance with EIA standards. There were no records of environmental violation pertaining to the EIA Act since 2001; all facilities within the park are 100% regulation-compliant, and there were no records of environmental violations since 2005.
4. As of end of April 2011: 82.5% recycle rate of waste, a 13.5% growth compared to 2007; completed construction of an environmental quality monitoring system to ensure excellent maintenance of the environmental quality.
5. Environmental information disclosure – completed the first national science park environmental report and won the 2010 Taiwan CSR Awards.
6. Strengthened disaster response capabilities and established the Integrated Disaster Risk Response Mechanism, which won the Executive Yuan's 2nd Government Service Award.
7. Implemented epidemiology research and health risk evaluation work, to ensure that park development does not affect the health of surrounding citizens.

#### Localized harmonic science park – promoting local culture and environmental education

Achievements include:

1. Preserved the local culture and completed transplant of old trees, built local religious centers and preserved current remnants and relics.
2. Created local employment opportunities, with the park



- employing more than 60,625 people. Local population accounts for nearly 80% of the working population.
- Effectively reduce work hazards and won Class A evaluation results by labor inspection agencies of the Council of Labor Affairs four years in a row.
  - Established an information platform which includes Sustainable LOHAS: Green Park, STSP Plant Tour System, Environmental Inspection Information and Public Arts Establishment websites. The information platform had more than 510,000 visits from January to June 2011.
  - Provided sufficient park information to the general public, through the production of six major categories of information: investment opportunities, business accomplishments, public art, ancient relics, local culture and environmental protection.
  - Actively invited citizens to participate in park activities; more than 80,000 people participated in the year 2010.
  - Promoted environmental education work, including elementary, junior high and senior high schools, and the working class. More than 2,000 people participated in the events in 2010.
  - Fulfilled social care and responsibilities. Devoted more than NT\$280 million in environmental protection related work, and budgeted more than NT\$10 million to assist local agencies and civic associations in organizing all types of projects, facility improvements and community-related events. From 2005 to May 2011, the amount given back to the community to assist local

development amounted to approximately NT\$22 million; in 2007, the STSP river patrol team was formed to support community watch.

Under the assistance and support of all circles, the STSP strives for continual improvement and innovation, and to leave a legacy for the science parks in Taiwan in terms of sustainable management. Looking at the future, the three main developmental directions of "Industry Grouping", "Sustainable Environment Green Park" and "Culture and Arts" were formulated as guiding principles for future efforts. It is hoped that the green park operation model can become a learning example for all domestic parks, so that industrial parks can cater to the economic, environmental and social aspects. Sustainable development should be more than just a slogan, but actual implementable steps that we can all take.



Promoting environmental education

## Bureau of Standards, Metrology and Inspection, MOEA: Establishing Hazardous Chemical Substance Testing Platform to Safeguard Excellent Quality of Living for the People Plan

The Bureau of Standards, Metrology and Inspection's (BSMI of the MOEA) function is to prevent domestic consumer products being contaminated with hazardous chemical substances (such as environmental hormones, etc.) that will affect consumer safety and health, and even worse, create damage to the country. In order to establish a product safety net, the Establishing Hazardous Chemical Substance Testing Platform to Safeguard Excellent Quality of Living for the People Plan was formulated by the BSMI, which encompassed five specific working items. The plan is to ensure that no unsafe products ever makes it to the market and that people's life and property are safeguarded. Accomplishments of related tasks are as follows:

### Formulate consumer product standards to ensure safe use of products

The plan formulated 109 national product standards, including formulating standards for toys, daily and baby care products, and textile products; regulating content limits of hazardous chemical substances in products; actively expand the number of CNS Mark items, which is the earliest product certification system in the country.

### Strengthen inspection of consumer products and prevent unsafe products

Strengthen product inspection and certification work and to prevent inflow of unsafe products into the domestic

market. In areas of consumer product monitoring, every year there are random market sample inspections (54 times in 2010), such as down products, plastic shoes, baby-purpose muslin and incense, etc. In total, 53,068 inspections, 6,536 purchase samples and 1,638 random samples were collected. Regular posting of aforementioned inspection results provide customers with product information. In addition, promotions were done at schools, exhibition halls and shopping malls (663 rounds in 2010) to teach consumers how to select qualified products and to prevent poor quality products, so that their safety and rights can be ensured.

### Volunteer supervisor and product safety information web – monitoring the consumer market

#### 1. Volunteer inspectors:

Volunteer inspectors are formed to involve public participation and assist the discovery of hazardous chemical substances in products; their first line inspection of products help reflect incomplete-labeled or poor quality product

#### 2. United inspection team for abnormal import products

A cross-ministerial united inspection team for abnormal import products was formed to check for abnormal import products. Seven divisions were formed. The divisions assisted in conducting related checks; in the future, the divisions will continue to collect related information and strengthen inspection procedures to prevent import of incorrectly labeled products into the market. This helps protect the domestic market, ensure consumer rights and protect legal businesses.

#### 3. Product safety information web:

Pioneered the first national consumer product safety precautions mechanism, and established the Product Safety Information Web. The Web effectively integrated market monitoring resources and actively makes contact with the suppliers and consumers. The platform has had more than 847,973 hits and won the Gold GOOD Award from the Consumers' Foundation for three years in a row.

### Improved tests for hazardous chemical substances

This plan involves massive collection of chemical substance test reports of the European Union and other advanced countries, and related measures taken by the EU pertaining to regulating hazardous substance content in products. It further planned the establishment of a chemical testing laboratory to improve hazardous substance testing technology that is compliant with safety regulations and can satisfy the needs of the general public. The lab will safeguard people's interests and prevent unsafe products from infiltrating the market.

### Improve accuracy of analytical measurements and safeguard lives by chemical measurements

This plan organized several promotional events such as the Chemistry and Measurement – Chemical Measurements to Safeguard Our Future series of events, academic seminars, meetings, international forums, laboratory open house, park tour and mountain-climbing/fitness events. An annual participation of around two million people ensures all levels of the society are reached,



The Product Safety Information Web

and their enthusiastic response signifies accomplishment of the goal. Through the aforementioned events, the public learn to discover whether products contain hazardous chemical substances and help to promote policies related to preventing unsafe consumer products and promotion of sustainable development. Further to implement our service ideal of "buy correctly, use safely and feel warmly", all measurement devices employed by the general population are regularly inspected and regulated, so that the public's interests are genuinely protected.

In the future, the BSMI will continue to perfect national standards and improve the technology to measure hazardous substances, to ensure product safety and protect the rights of consumers; through the use of the Product Safety Web, market monitoring and management is strengthened and deficit products are identified; actively promote development of domestic green industry and technology to improve safety, health and living environment for the general public; actively ensure that environmental protection, economic development and social justice are all cared for, to the true fulfillment of sustainable development for Taiwan.



Explanatory meeting for product volunteer inspectors



Carnival for the families

## Railway Reconstruction Bureau, MOTC: Hualien-Taitung Railroad Overall Service Enhancement Plan

The Ministry of Transportation and Communications (MOTC) commissioned the Railway Reconstruction Bureau (RRB) in carrying out the Hualien-Taitung Railroad Overall Service Enhancement Plan. The plan will transform Hualien-Taitung stations into livelihood stations by improving all 29 stations and ancillary facilities of the Hualien-Taitung line, with the hope that tourism for the area could be a pilot development model. The five-year plan (from 2009 to 2014) has a total budget of NT\$6.081 billion. After the implementation of the Plan, the train stations can provide comfortable and functional services to passengers, while maintaining different areas for administration, passenger service or commercial zones and ensuring they are independent of one another. To provide a safe, convenient, comfortable and aesthetic environment for passengers, and added the automatic train service, tour service, agricultural product service, internet e-service and catering service as value-added services, it is hoped that by raising the service standards of the railroad administration, tourism on Eastern Taiwan can be invigorated, with value-added benefits for the

industries.

### New Station Movement

Across the nation, it is difficult to locate a series of train station renovation project, especially in beautiful scenic areas like Hualien-Taitung. Therefore the RRB of the MOTC formulated the New Station Movement to effectively accomplish the end. The plan is culturally diversified and caters to sustainable development. To achieve the intended goals, the Station Renovation Efficiency Improvement: New Face for Hualien-Taitung forum was held on 17 June 2010, where local representatives, scholars and experts participated; opinions gathered from the forum were used as reference in the formulation of declarations and design goals of the New Station Movement. Subsequently, the movement listened to the opinions of the people with regards to train station renovations and improvement projects, and opened an official internet channel to gather opinions across all stakeholders.

In addition, local historians, architecture scholars and





Hualien station

Hualien station,  
Xinchen station, Yuli  
station simulations

experts and government representatives formed the Design Factor Provision and Counseling Committee, to provide local historical flair, regional needs and specific agricultural products to designers for them to incorporate in their overall train station design. Further, an evaluation committee was set up to follow-up on the design results. The Design Result Evaluation Committee was established to ensure that the one-township-one-uniqueness spirit is followed in the actual design of stations.

The aforementioned process and the following groundbreaking bidding methods of the RRB such as declaring committee members names, multiple voting bidding model, awarding of medals and prizes to winning designs, and open tender for bids on the Taiwan Architect Magazine, etc., all demonstrated the government's determination to successfully "make things happen" in the Hualien-Taitung stations. It is further hoped that through complete local interaction and participation, a result that can satisfy everyone is accomplished. Therefore, this plan does not involve transferring stations from the west to the east, but to uniquely design every station so that it integrates with the local features. The newly refurbished faces of Hualien-Taitung train stations will provide added benefits for tourism; and their innovative design effects will pave the way for future designs.

### **Hence the following declaration and goals of the RRB:**

Declaration:

- Improve train stations' efficiency
- Strengthen railroad service facilities
- Integrate local historical features
- Introduce green building concepts
- Excellent home for LOHAS and cycling
- Becoming the doorway for international tourism
- Energy conservation, carbon reduction and sustainable development

### **A new face for Hualien-Taitung**

Seven Design Goals:

1. Adopting local historical features of Hualien-Taitung in the design of train stations
2. Integrating the landscape in the design of sustainable green buildings
3. Promoting tourism for the east coast and creating a seamless environment for the TRA and cycling
4. Improving railroad service quality and complete common, internationalized and standardized transport facilities
5. Establishing seamless information and transportation service, giving us a time and space advantage
6. Completing all utilitarian functionalities of all stations, and creating a LOHAS leisure environment for the people
7. Nurturing the stations as a doorway for tourism and providing varied services to enhance the quality of leisure life

The design aspects of the Hualien-Taitung New Station Movement can reflect the spirit of the times. In terms of design, it accurately reflects the local natural and cultural characteristics, and amply displays the environmental protection or energy saving features of the stations. Only through such designs can the true nature of the stations be brought out, and that new stations could be the new power stations of urban renewal and tourism development. A comprehensive view of Taiwan shows that only Hualien-Taitung remains uncontaminated. Therefore, the train station designs of the area should not be grand in scale and superfluous; instead, the design should be in line with transportation needs and simple on the exterior. The plan not only focuses on the individual stations, but also on expansion and proliferation. The stations are not carbon copies of stations of the west, thus environmental interactions and numerous other aspects



are considered, with reservations for future space and flexibility.

### 1. Introduction to station function improvement

- (1) **Bicycle replenishment stations:** provide rental of bicycles, rest spots so that the public can travel to the east by train and enjoy the fun of riding bicycles with spot A rental and spot B return services.
- (2) **Catering and agricultural product demonstration services:** under the pretext of not affecting the operation of the station and movement of passengers, ample spaces will be allocated to invigorate local farming products.
- (3) **Tourist Centers:** centers are set up in stations with tourism resources to help promote local tourism and provide related services to enhance the quality of travel.
- (4) **Friendly station environment:** movement spaces/lines within the stations are comprehensively planned, so that it truly becomes barrier-free environment; also incorporated into the design is gender equality space designs.
- (5) **One town one unique flavor:** train station renovations incorporate local landscape and humanities, so that the stations become local model buildings, incorporated with leisure, simple design style.
- (6) **Green train station:** the concept of green building is introduced in the designs, following the nine major indicators of green building. All stations have their

own targeted green building standards and efforts to achieve Green Building Mark are dedicated.

### 2. Positive impacts

- (1) **Time savings and cost reductions:** reduce traffic hours and lower accidents due to passengers and crossing of railroads.
- (2) **Sustainable development effects:** the plan is grounded on the foundation of sustainable development for the nation, and environmental friendliness, energy conservation, carbon reduction and depth of cultural characteristics are displayed in the third generation stations.
- (3) **Implementing energy conservation and carbon reduction policies:** savings for train operations reduce costs of air and noise pollution, making Taiwan a pioneer in the road toward global village, living up to the reputation of the bicycle kingdom and increasing Taiwan's international visibility.
- (4) **Increased value for train station and surrounding land:** with the train station as the center of business district development, it is of tremendous aid to local development and land development along the train lines.
- (5) **Tourism effects:** expand Hualien-Taitung tourism lines, collaborate with tourism service products planning, environmentally friendly trains, cruise liner trains and bicycle leisure networks all aid to promote Taiwan's tourism.

### 3. Current situation

The RRB had completed intricate design details of the upcoming stations, on schedule with its yearly plans. Subsequently, all tenders and operation of projects will be expected to be completed by the end of 2014. The spirit of completing projects on time and with high quality will ensure that the Hualien-Taitung Railroad Overall Service Enhancement Plan was successful. Motivated by the Hualien-Taitung New Station Movement ideals, the vision of improving efficiency of the stations and creating a new face for Hualien-Taitung can surely be accomplished.



Forum on train station improvement

# 2011 International Forum on Sustainable Development

The 2011 International Forum on Sustainable Development was held in Taipei from 6-7 September 2011. The main topics discussed included analyses of sustainable development policies and their implementation in nations around the world, American youth participation in the 2012 UN Conference on Sustainable Development (Rio+20), as well as sustainable city policies in Taiwan and internationally.

Invited to this year's forum were a number of foreign and local experts and academics, senior officials from government agencies, and NCSD members. Speakers included George J. Gendelman, co-founder of Planetworkshops; David Willey, Audit Practices' Director in the Office of the Auditor General of Canada; Gino van Begin, International Council for Local Environmental Initiatives (ICLEI) Regional Director for Europe/Deputy Secretary-General; Emani Kumar, Executive Director of ICLEI's South Asia Regional Team; Dr. Yoon Lee, senior researcher at the Global Growth Strategy Research Center and the Korea Environment Institute; and Rachel Briggs, coordinator of Sustain US.

## Premier Wu Reaffirms Government Policy on Sustainable Development

Premier Wu Den-yih, who also serves as Chairman of the NCSD, pointed out in his opening remarks of the forum that shortly after taking office, President Ma Ying-jeou ordered an assessment of the planned steel foundry in the Bin-nan Industrial Zone. After reviewing the assessment, President Ma put off the proposed project. Another project that was halted due to sustainable development considerations was the construction of the Kuokuang Petrochemical Plant. Both cases, said the Premier, are clear proof of consistency in the current government's sustainable development policy.

Premier Wu was keen to point out that national development is not defined solely by the state of technological R&D or economic growth; environmental protection, preservation of cultural heritage, creation of employment opportunities, and anything else that enriches the spiritual and material lives of Taiwan's citizens are also essential. Since President Ma assumed office, the Executive Yuan has formulated the Six Key Emerging



Premier and NCSD Chairman, Wu Den-yih, giving the opening remarks at the 2011 International Forum on Sustainable Development





- ❶ Enthusiastic attendance by local and foreign delegates from the government, academia, and private-sector organizations at the forum
- ❷ Local, foreign experts discuss and share experiences

Industries Plan. The six industries regarded key to national sustainable development are green energy, biotechnology, medical services and healthcare, quality agriculture, travel and tourism; and the cultural and creative industry.

### **Taiwan Recognized for International Efforts in Promoting Green Industries Since Its 2007 APEC Announcement**

Mr. George J. Gendelman presented a speech, in which he talked about the recent history of sustainable development worldwide. He also predicted that next year's UN Rio+20 conference would focus on eradicating poverty and promoting sustainable development as a part of the green economy. He also gave some examples of international cooperation that have successfully demonstrated the importance of establishing sustainable development mechanisms, such as the Clean Development Mechanism, Zero Carbon Cities, the Renewable Energy and Energy Efficiency Partnership, and the Global Village Energy Partnership. Mr. Gendelman also praised Taiwan for actively seeking international cooperation since announcing that it would be promoting green industries at the 2007 APEC conference.

Mr. David Willey described how the Canadian government has been promoting sustainable development since the 1990s, for example by implementing the Canadian Environmental Assessment Act; revising the Auditor General Act to include sustainable development policies and establishing the Environmental Sustainable Development Committee; and passing the Federal Sustainable Development Act in 2008. Canada also plans to use government core planning and budgeting systems to detail environmental assessment targets and implementation strategies. In addition, starting

from 2012 or 2013, annual reports on the progress and efficiency of sustainable development policies will be reviewed by the legislature.

Mr. Gino van Begin pointed out that by 2030, over two-thirds of the world's people will live in cities and the economic output of the world's 100 largest cities will be the equivalent of 30% of gross world product. By 2050, the total global urban population is projected to exceed 3 billion, hence municipal governments in countries around the world will be key players in realizing sustainable development. Mr. van Begin called upon municipal governments to set up an international network to promote cooperation on and participation in global sustainable development plans and to push the UN to promote the signing of multilateral parallel agreements.

Dr. Yoon Lee gave a speech entitled "The Second Sustainable Development Basic Plan" in which he explained how nations have been promoting the Second National Sustainable Development Strategies in 2011. Mr. Lee suggested that national governments should formulate measures to increase the effectiveness of the ten main sustainable development strategies.

Dr. Rachel Briggs related her experiences of personally organizing the participation of a delegation of American youth for the 2012 Rio world summit and emphasized the importance of young people's contribution to the promotion of sustainable development at the national level. Ms. Briggs pointed out that broadening the reach of education and research will facilitate greater participation of youth in policy making and local grass-roots organizations, which will stimulate the adoption of sustainable development ideas in social, economic, and environmental areas. Greater youth participation will also help bring about a more harmonious society built upon equality and the meeting of needs.

# Words from Our Members



## Ecological Conservation is of Utmost Importance for the Sake of Our Future Generation

*By council member Dr. Kwang-Tsao Shao, Research Fellow and Executive Officer of Biodiversity Research Center, Academia Sinica*

Based on statistics revealed by the 2010 UN-published Global Biodiversity Outlook (note), efforts pertaining to the conservation of biological diversity were initiated by world governments at the 1992 Earth Summit through the signing of the Rio Conventions and passing of the Convention on Biological Diversity (CBD). The second Earth Summit in 2002 and the pronouncement of the 2010 Biodiversity Target further demonstrated the clear intent of world governments in minimizing the rate of extinction of species. After more than two decades of efforts, based on the current statistics provided by the signatories of the CBD, humans continued in their path of over-development and over-utilization of biological resources, which has led to the increased probability of climate change and extinction of species, as seen in numerous regions, especially in the ocean, rather than slowing down or reverse the trend. In light of this, UN Secretary-General Ban Ki-moon had to pronounce the failure of the Biodiversity Target in 2010, was named the International Year of Biodiversity. As new directions in guiding the efforts of the next decade, the dignitaries included the Aichi Biodiversity Targets during the X/2, the tenth meeting of the Conference of the Parties in September 2010.

In retrospect, the National Council for Sustainable Development (NCSD) of Taiwan has faced tremendous challenges since its inception in 1997, such as: frequent change of political parties, vacillation between economy-driven or environment-focused policies, unclear division of responsibilities, desire for quick success, shortage of funds, etc. Nevertheless, there are still encouraging results through the joint efforts of the government, academia, industry and civic non-government organizations, such as the proliferation and acknowledgement of the understanding of the concepts of climate change and ecological conservation. Since Taiwan is uniquely located in a typhoon-prone region and within the earthquake belt, she has suffered frequent natural calamities to instill a sense of understanding of the importance of preserving

ecological stability. The natural resources within the ecological system are the greatest asset to help human beings combat climate change. Things such as air, freshwater, energy and millions of species within earth's ecological system are human technology. In fact, once humans have over utilized and damages reach the threshold limit, the collapse of the entire ecological system will result in an irreversible phase change. This will lead to the unspeakable catastrophe of the Sixth Extinction of Species in that humans will lose all protection and livelihood of the natural ecological system. So, for the sake of our future generation, we must do something immediately to conserve our ecological system!

In my three years experience as member of the NCSD, I realize that in order to promote conservation of ecological system in Taiwan, a top-down approach is needed besides the bottom-up approach, which focuses on popularizing the importance of ecological conservation to the general public, who in turn monitors and promotes government policy changes. The top-down approach entails the clear formulation of national ecological conservation policies by the government through allocation of budgets, and discussion with scholars and experts in detailing implementable sustainable policies; in addition, related government agencies are given the responsibilities of promoting ecological conservation pertinent plans and monitor the progress to ensure results. I will try to explain this process through the integration of biodiversity database that I initiated in the academia:

Ten years ago, I discovered that the nation was in dire need of a national biological diversity database and therefore urged the digitization of original data collected through ecological investigation that are supported by public funding, in the hope that our domestic conservation commons can be enriched. However, due to agency parochialism, selfish personal agendas and intellectual rights problems, progress has been limited. Two years ago, I proposed similar project through the NCSD that

encompassed submission of digitized raw data for all publicly funded projects, governed by the National Science Council (NSC). In addition, a cross-ministerial agency, the ROC National Committee for GBIF, was established in Academia Sinica to coordinate communications and promotional efforts. Thus, with the aid from the NSC and the Council of Agriculture, numerous integrative databases that are compliant with international GBIF, COL (Species 2000), BOL and EOL are formed, such as: Taiwan Biodiversity Information Facility (TaiBIF), Catalogue of Life in Taiwan (TaiBNET = TaiCOL), Taiwan Cyrobanking Program for Wildlife Genetic Material in Taiwan (TaiBOL) and Taiwan Encyclopedia of Life (TaiEOL). In other words, NCSD still has its functions in promoting these conservation efforts.

In the area of marine conservation and sustainable fishing, Taiwan is currently the 20th largest nation in terms of fishing harvest, 12th in terms of fish consumption, and 4th in terms of consumption to population ratio. Therefore, the government usually places the livelihood of the fishing population ahead of ecological conservation. In addition, voting pressure from elections and peoples' representatives render efforts in marine conservation and sustainable fishing difficult to accomplish, which can be seen in results such as: delaying of the legalization of the Coastal Act, difficulty of allocating and implementing

marine conservation zones, and lacking of conservation and law-abiding ideals among citizens. Hitherto, the general public still enjoys consuming bluefin tuna, shark's fin and coral reef fishes, or hold festivals or tourist attractions based on fish. Personally, these two years mark tremendous efforts on my part in increasing consumer awareness through "Seafood Guide", and public viewing and lectures on the film "The End of the Line"; nevertheless, the effects have been limited.

Actually, the conservation of biological diversity can be coupled with economic profits. Wildlife should include marine lives as well. Marine lives can not only be consumed as food, but also can be utilized in areas such as ecological tours, bio-tech development, biomimetic materials, pleasure viewing and breeding technology. In the coming decade, if we do not hasten our efforts in ecological conservation and restoration, we might miss the golden period and the result may be what scientists predict will happen in 2048: no fish in the seas for us to consume and view. What can we say to our posterity then? As a member of the NCSD, I feel the weight of my responsibility is even heavier.

**Note: The third version of the Convention on Biological Diversity (CBD) can be downloaded at <http://www.cbd.int/doc/publications/gbo/gbo3-final-en.pdf>**



## Constructing a People-centered Sustainable Transportation Network

*By council member Vicky Liu, Director of Cycling Life-style Foundation*

Since returning from the United States, I have been actively engaged in promoting the "cycling lifestyle" and the "round-island cycling green ecological tour". As a civilian member on the National Council for Sustainable Development (NCSD) for the second year, I have provided input on NCSD workgroup meetings involving communication with officials of various departments and different task forces with regards to restructuring the national transport system, R&D of energy conservation and carbon reduction of transport technology, legislation of road safety, restrictions on automobiles, realigning of

city traffic lanes, traffic safety measures in communities, living through cycling and environmental conservation, etc. All these issues involve a brand new perspective that encompasses every aspect of our lives, imbued with a sense of environmental consciousness.

In recent years, I have accompanied several officials of the Ministry of Transportation and Communications (MOTC) to visit developed countries such as the Netherlands, Spain, and France, countries adamant in promoting green transport. It is my hope that Taiwan can learn from these countries and develop a people-based



green transport network that will eventually aid in the realization of the National Sustainable Development Policy Plan. For example, the world's leader in advocating traffic safety – the Ministry of Transport, Public Works and Water Management of the Netherlands – is strictly enforcing road safety based on the principles of sustainable safety; slow city traffic lanes are restricted to a speed limit of 30 km/h. This ensures that pedestrians and cyclists have the right of way. Traffic safety for the elderly and children are noticeably protected by the legislations of these developed countries. In view of this, if Taiwan is to implement a friendly environment of sustainable transport network, strong central leadership that can guide the entire NCSA that facilitates cross-ministerial cooperation and allows every member to perform to the best of everyone's ability, is essentially needed.

In the area of sustainable safety, it is my personal opinion that the government should prioritize the uncontrolled growth of automobiles: the seating capacity of automobiles is low, yet they consume large proportion of our fossil fuels. Furthermore, automobiles occupy traffic lanes and road-side parking spaces that endanger the safety of pedestrians and cyclists. In addition, the exhaust they produce contributes to air pollution and acid rain, and the sounds of their horns are detrimental for the well-being of the general public. Therefore, I urge the city districts to adopt a new culture that encourages commuting by cycling. I also work with the government to pass the regulations to protect the right of way for "vulnerable road users – Pedestrians and cyclists" and aid the automobile industry in becoming more environmentally friendly (for instance: developing electric vehicles), so that the right of way of the roads can be returned to pedestrians and cyclists, allowing every elderly and child to safely use the roads.

I recall during my earlier years that often I would be happily pushing along my baby carriage for walks, but very often the community alleys would be jam-packed with motorcycles and automobiles. These vehicles would

frequently make their way through the narrow alleys to avoid peak-hour traffic in the main boulevards. The speeding motorcycles, the exhaust fumes, and the noise generated are highly troubling for young infants and elders in wheelchairs. I recommend that relevant authorities should restructure the transportation network, impose stricter enforcement of slow lanes in cities, and impose heavier penalties on traffic accidents as soon as possible, so that the general public can have a quieter, cleaner and friendly transportation environment.

The impetus for immediate enforcement of 30km/h speed limit is the fact that it helps reduce accident rates and alleviate traffic accident repercussions. During one of my visits in the Netherlands, I was slightly bumped by a motorcycle on the slow lane. It was fortunate that damages were minimal, and the Dutch transportation officials left an indelible impression through this incident as they explained the need to limit vehicle speeds and how that protects pedestrian safety.

In addition, research by the Ministry of Transport, Public Works and Water Management of the Netherlands indicate that on average, every Dutch person owns 1.13 bicycles. Moreover, cyclists that commute more than 7km daily have 3 more healthy years and 10 extra years of life on average versus non-cyclists. What this means is that by using bicycles as alternative vehicle for our short distance commute, we can lengthen our lives, lower medical insurance costs, raise our standards of living and minimize our impact on the natural environment.

At the centennial celebration of Taiwan, we organized the One Bike One event, an event that we aimed to be recognized by the Guinness Book of World Records to be the largest organized ride, in conjunction with the Council for Cultural Affairs and the Sports Affairs Council. It is our hope that this record-breaking event will usher in a new fervor for embracing cycling in our daily lives, and guide the nation to a new era of peace, prosperity and sustainable development.



### Ecological Debts and Economic Growth

*By council member Ssu-Li Chang,  
Professor of Institute of Natural Resources Management, National Taipei University*

Looking back at 2011 from the future, it will surely be remembered as one remarkable year in history. It is this year that the predictions made in the book *The Limits to Growth* proposed by the Club of Rome in 1972 come to

pass. This year marks the watershed where the economy of the world plummets into gradual decline as classic investment-based and innovation-based growth theories have to come face-to-face with the inevitable restraints

under the prevalent conditions of limited resources.

The economic crisis of 2008 has left scars in the economy that have yet to be reconciled. Recent global economic outlook revealed by OECD predicts downside risk of GDP growth in the overall Euro area and Germany as well in the coming year. If we take the case of Japan for its shrinking economy persisted for more than a decade with the current situation of heightened perceptions of economic risk and financial market turbulence, which are expected to weigh on the outlook for the advanced economies, this is what cast out my doubt that the world might confront its ultimate limit of growth. The trend demonstrated by the world's economy, under the restrictions of current technology and access to resources, are at best already capped in growth.

However, from a sustainable environment perspective, the subtle yet accelerating world economic downturn might be a beneficial turning point for mankind. It provides an avenue for us to re-consider priorities, make plans for the future and adjust development strategies. This perspective is not to mock what has happened, but rather as a means to awaken the self-defense mechanism and wisdom of the homo sapiens that has preserved us by avoiding harm and embracing luck. Statistics showed that the ever-increasing world's wealth is closely linked to the ever-deterioration of the natural ecology and depletion of natural resources. In other words, when the world's attention is fixated on the financial debt problems of advanced countries, the scope of inherit ecological debts that are uncalculated are beyond the boundaries of our imagination.

Based on statistical data compiled and estimated by UC Berkley scholars using information from the United Nations and the IMF from the period of 1961 to 2000, environmental damages include climate change, depletion of the ozone layer, land use change, deforestation and over-fishing can be added up to about 47 trillion US dollars (based on 2005 monetary values). This figure is greater than the World Bank's estimation of global total GDP in 2005 (\$44 trillion), and is twice as many as the sum of the GDP of the US (US\$14.58 trillion), Japan (US\$5.5 trillion) and China (US\$5.88 trillion) in the same year. This research also indicates that the ecological footprints of middle-income and high-income nations imposed on nations with low-income are estimated to be US\$2.5 trillion respectively. The ecological footprints of high-income nations on middle-income nations amount to US\$4.9 trillion. In a world of complex economic activities among nations, the total ecological debt of high-income nations to

middle-income and low-income nations is US\$2.2 trillion and US\$1.82 trillion respectively. Nonetheless, these actual environmental damages are not accounted in the market system and as such, losses are borne solely by the injured party. In the computation of Gross Domestic Product (GDP) or International Balance of Payment (IBOP), these factors are not reflected in the calculations, and hence their effects attract no attention and relevant mitigation plans. The consequences are the deterioration of the natural habitat, the depletion of resources and the gradual loss of vibrancy and energy of the planet.

In fact, the inherent meaning of the book *The Limits to Growth* is not to expound on the negative sentiments of the overshoot and collapse of the economic system (including population, industrialization, pollution, production of food and energy consumption), but rather it wants to convey a proactive, positive and constructive message. The message is to warn the human race to repent of its ways and adjust accordingly before the irreparable happens. The message is to encourage proper harvesting and utilization of the world's natural resources that caters to the fundamental needs of the people and which adheres to the principle of fairness. Further, it advocates steady state development model that strikes a balance between economic and ecological needs, thereby creating a sustainable environment, economy and society.

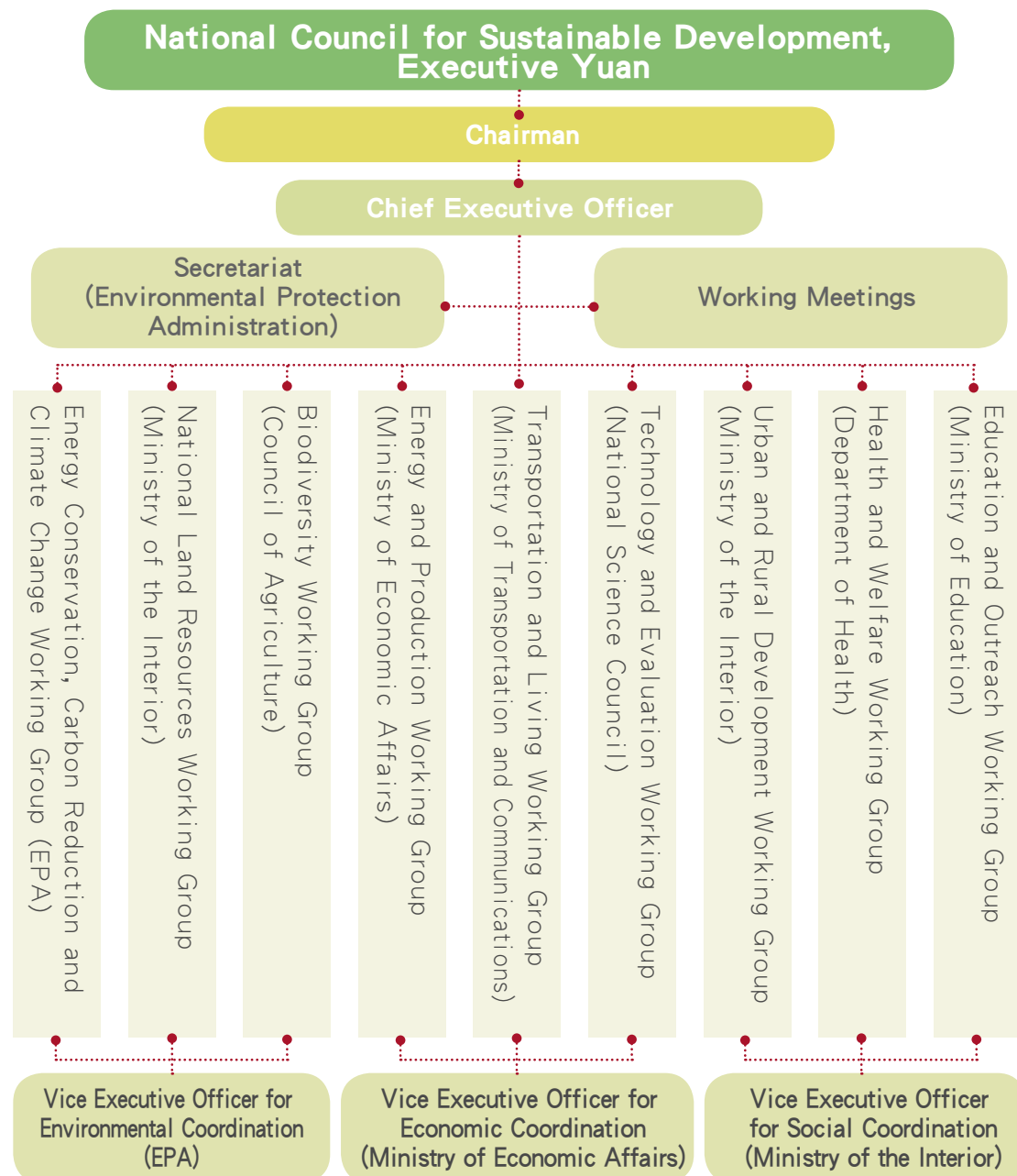
The advancement of civilization does not necessary require the accompaniment of economic expansion of wealth accumulation. To grow or not to grow, the economic system needs to find out a sustainable development path that can self-adjust and re-build its values. The recent publishing of the book *Prosperity without Growth* can be seen as the turning of tides of the academia in response to the "Economic Growth Model".

Faced with the weary and torn environment, widening of gap between the rich and the poor, and rising conflict among the different social problems brought about by this "Economic Growth Model" status, perhaps it would be good for us to view the conditions surrounding the sluggishness of our economic growth as opportunities and means to solve the current environmental problem. The accelerating pace of national debts across the globe warns us of the invisible ecological debts that encompass the current situation. It is my sincere hope that through the slowing of growth, it will inspire our wisdom and prudent actions so that the society, economy and environment can at last find their balance.

# Appendix

## Appendix I

# Organizational Structure of NCSD





## Appendix II

## The Members of NCSD

## Government official members

Name	Position Organization
Wu Den-yih	Premier, Executive Yuan
Christina Y. Liu	Minister of Council for Economic Planning and Development, Executive Yuan
Jiang Yi-huah	Minister, Ministry of the Interior
Wu Ching-ji	Minister, Ministry of Education
Shih Yen-Shiang	Minister, Ministry of Economic Affairs
Mao Chi-Kuo	Minister, Ministry of Transportation and Communications
Chen Wu-hsiung	Minister, Council of Agriculture
Lee Lou-chuang	Minister, National Science Council
Chiu Wen-ta	Minister, Department of Health
Stephen Shu-hung Shen	Minister, Environmental Protection Administration

## Expert and academic members

Name	Position Organization
Lee Ling-Ling	Professor, Graduate Institute of Ecology and Evolutionary Biology, College of Life Science, National Taiwan University
Shao Kwang-Tsao	Researcher, Research Center for Biodiversity, Academia Sinica
Wu Tsai-yi	Chairman of Taiwan Research Institute

Name	Position Organization
Chen Yu-Hui	Professor, Department of Agricultural and Applied Economics, National Taiwan University
Chang Ssu-Li	Professor, Institute of Planning, National Taipei University
Chen Hongey	Professor, Department of Geosciences, National Taiwan University
Yeh Sandy Yu-lan	Associate Professor, Central Police University
Liao Huei-chu	Professor, Department of Economics, Tamkang University
Chiang Pen-Chi	Professor, Graduate Institute of Environmental Engineering, National Taiwan University
Feng Cheng-Min	Professor, Institute of Traffic and Transportation, National Chiao Tung University

## NGO representative members

Name	Position Organization
Alice Yu	President, Yu Chi-Chung Cultural and Educational Foundation
Lin Chun-Shin	Chairman, Archilife Research Foundation
Lai Jung-hsiao	President, Society of Wilderness
Lin Yi-Hou	Director, Urban Regeneration R&D Foundation
Julia Chou	President, Conservation Mothers Foundation
Romy Kung	Director, Taiwan Responsible Care Association
Chen Shih-chang	Chairman, Formosan Society for Indigenous Sustainability
Vicky Liu	Director, Cycling Life-Style Foundation
Lo Shang-Lien	Director, Taiwan Environmental Management Association
Hsieh Chang-fu	Director, Biodiversity Association of Taiwan