

Strategy **Adaptation to Climate Change**

Management **Environmental Management System**

Greenhouse Gas Reduction Targets

Address **Increasing Eco-efficiency**

Response **Green ICT**

Target **Blueprint for Environmental Sustainability**



- *The mobile communications subsidiary is the first domestic mobile communications company to pass the ISO14001 environmental management system certification*
- *Outstanding Enterprises and Organizations in Green Procurement Award by the Environmental Protection Administration, Taiwan*
- *“Distinguished Enterprise Award” from the 2010 annual industrial waste and renewable resource cleanup and resource reduction, recycling, and reuse event held by the Environmental Protection Administration*
- *Corporate award from the 2010 green consumer competition held by the Environmental Protection Administration*
- *“Outstanding Award from the Communications and Broadcast Group” from the waste resource management performance nominations held by the Environmental Protection Administration*
- *First place in the clean homes category from the 2010 environmental awards of the Environmental Protection Administration*
- *Consecutive win of the 2010 award for outstanding green procurement benchmark corporation by the Taipei City government*
- *Winning the 2010 gold award for energy conservation by the Taipei City government*

Adaptation to Climate Change

We promise to use our core capabilities as our foundation as we commit to addressing global climate change issues, achieve energy and carbon reduction benefits, and enable consumers to enjoy low carbon telecommunications services.

Climate Change Adaptation Strategy

We regard climate change Adaptation as an important issue in future continuations of impact reductions for provisions of telecommunication services. Currently, climate change phenomena in Taiwan consist primarily of excessive regional concentration of rain. Risks of climate change against us are expected to include primarily direct dangers against telecommunications machine rooms and facilities during our operation. We need to allocate budgets and execute disaster prevention plans and actions.

Risk Management Procedures

We have established the Environmental Sustainability Group under the CSR Committee to undertake compilation of the entire group's response measures and improvement results for climate change, formulation of short, medium, and long term targets, and incorporation of energy and carbon reduction and environmental issues into business plans, all of which are reported by the group's vice presidents to the Board of Directors. The Board of Directors is responsible for deciding management strategies / examination of results related to climate change. High management levels execute the strategies / interdepartmental communication and coordination determined by the Board of Directors. Management units within the company execute and supervise the action plans of their designated units, as well as compiling execution results of their activities. Meanwhile, branch agencies execute daily management activities and engage in self assessments.

Working with Policymakers

We actively participate in public hearings regarding climate change legislations with relevant government units (Environmental Protection Administration of the Executive Yuan, Bureau of Energy of the Ministry of Economic Affairs), as well as the post-COP15 Nama action plan and international legislative review conferences. We also participate in information seminars held by Taiwan's Environmental Protection Administration regarding greenhouse gas reduction policies, carbon trading, and energy and carbon reduction action plans.

Participation in International Organizations and Focusing on the Cancun Conference

We have been a member of the World Business Council for Sustainable Development (WBCSD), which is led by the CEOs of over 200 international corporations, focusing on commercial and sustainable development issues. Taiwanese members include Acer, CPC Corporation, and Chunghwa Telecom. Over the years, we have analyzed the newest international sustainability issues and trends through information sharing and frequent interaction in WBCSD. From November 29, 2010, to December 10, the United Nations Framework Convention on Climate Change's (UNFCCC) 16th Conference of the Parties (COP16) was held in Cancun, Mexico. We have also gained an in-depth understanding of international carbon reduction trends after the Kyoto Protocol from the depth of WBCSD's involvement in this conference.

Environmental Management System

As we continue to strive for “reduced environmental impacts” creating environmental management systems is an important element. We have taken leadership in the industry in conducting the first greenhouse gas audit in 2008. Under appropriate control, total greenhouse gas emissions in 2010 are far lower than emissions in 2009 and 2008, fulfilling our promise to greatly reduce total greenhouse gas emissions. We continue to actively strive for ISO14001 environmental management system certifications. Certifications for all agencies are expected to be complete by 2012.

Internal Corporate Enforcement Procedures

The Environmental Sustainability Group formulated internal corporate environmental codes of conduct and pamphlets, as well as green energy standards (greenhouse gas reduction targets). We have implemented the “Employee Innovation Proposal Regulations,” which stipulates financial rewards for employees who provide improvement plans and innovative ideas for climate change that are adopted by the company.

To enable convenient storage, retrieval, and control of environmental performance information for all units in the company, we have established the group environmental database – “Environmental Sustainable Development Management System” (EARTH). The systematic information and analytical aspects provide sufficient foundations for all business units to formulate quantifiable environmental improvement targets and effectively increase the efficiency of executing environmental management operations. This system completely displays audits on internal electricity usage, water usage management, water resource management, lighting facility management, resource recycling, vegetation plantation, etc, for all agencies, demonstrating more efficient management and environmental results. Nationwide promotional tours are also held to facilitate



Login page of the “Environmental Sustainable Development Management System”

education and training in all business units with focus on system functions and usage methods, so that all employees can understand system application methods.

ISO14001 Environmental Management System Certification

In order to ensure environmental sustainability in 2010, we continued our efforts to secure the ISO14001 environmental management system certification. Certifications for all agencies are expected to be complete by 2012. The mobile communications subsidiary opted for the ISO-500001 energy management system standard in 2011, which greatly improves environmental management.

ISO14001 Certification Sequence for Chunghwa Telecom’s Units

Year	Execution Unit
2008	Southern Taiwan Business Group
2009	Mobile Business Group
2010	Northern Taiwan Business Group / Data Communications Business Group
2011	International Business Group / Telecom Laboratories
2012	Telecom Training Institute / Enterprise Business Group

Greenhouse Gas Reduction Targets

In 2008, we took leadership in the industry and conducted greenhouse gas audits, becoming the first telecommunications company in Taiwan to receive the ISO 14064-1 confirmation letter. In 2009, we became the first telecommunications company to formulate energy and carbon reduction targets. In 2010, we reached our targets ahead of schedule, returning greenhouse gas emission in 2012 to 2007 levels. In the future, we will also account for the government's carbon reduction targets and return to 2005 levels by 2020.

Execution of Annual Greenhouse Gas Audits

In 2008, we took leadership in the industry and conducted the first greenhouse gas (GHG) audit, which is verified by SGS Taiwan as the third party. The GHG Protocol developed by the World Resource Institute (WRI) and WBCSD is also used as the audit tool for data calculations and creation of GHG emission records, which will act as the foundation for future efforts for GHG reduction and carbon management.

Reductions in GHG Emissions

Currently, our audit covers Scope 1 and Scope 2. Results indicate that externally procured electricity is our most significant source of GHG emission. Therefore, we have collectively initiated various electricity conservation actions. Scope 3 is currently not incorporated into audit coverage, and only fixed unquantifiable analyses can be done. In the future, we will gradually investigate the effects of GHG emissions from employee travels.

In 2010, our total GHG emissions is 905,095.14 t-CO₂e, far lower than emissions in 2008 and 2009. Under appropriate controls, we achieved great reductions in total GHG emissions. In the future, we will still capitalize on electricity usage management and electricity usage reduction as our main axis to implement effective and concrete actions and fulfill our promises.

Greenhouse Gas Emission Analysis of Chunghwa Telecom (Verified)

Scope	Greenhouse Emission Source	Emission Volume		
		2008	2009	2010
Scope1	1. Gasoline and diesel use by business and engineering vehicles 2. Kitchen and washroom facilities 3. Dispersion from wastewater clarifiers 4. Dispersion from fire extinguishers and refrigerants	31,721.54	39,087.09	30,710.73
Scope2	Externally procured electricity for office towers, telecommunications mechanical rooms, and optical fiber facilities	914,298.91	932,562.44	874,384.41
	Total emissions	946,020.45	971,649.53	905,095.14

Note 1: "Verified" refers to emission volume data verified by impartial third party verification.

Note 2: Emissions is calculated in CO₂ equivalents, in tons (t-CO₂e).

Note 3: Organizations covered by GHG emissions records for Scope 1 and 2 include those who borders cover Chunghwa Telecom Headquarters, its 6 subsidiaries (Northern Taiwan Business Group, Enterprise Business Group, Mobile Business Group, Southern Taiwan Business Group, International Business Group, and Data Communications Business Group) Telecom Laboratories, and Telecom Training Institute. All emission sources covered within such borders are 100% owned and controlled by our company.

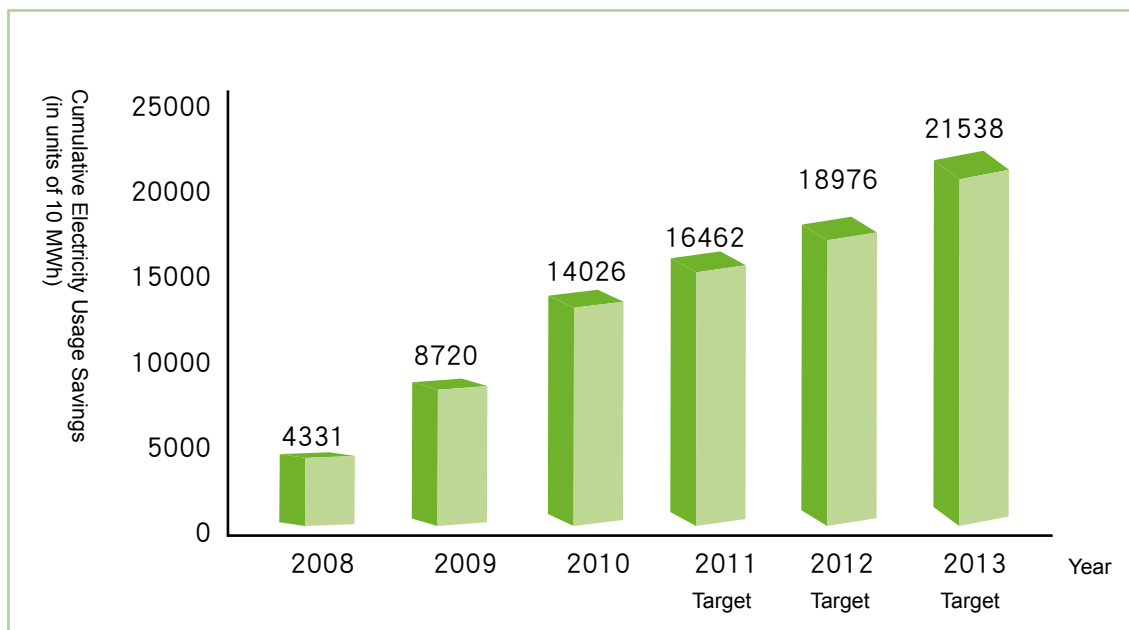
Electricity Usage Management Targets

Energy and carbon reduction plans for information and communications mechanical rooms and office buildings will be executed in stages, which is expected to reduce electricity usage by 168 GWh by 2012, as compared to 2007 (excluding business growth).

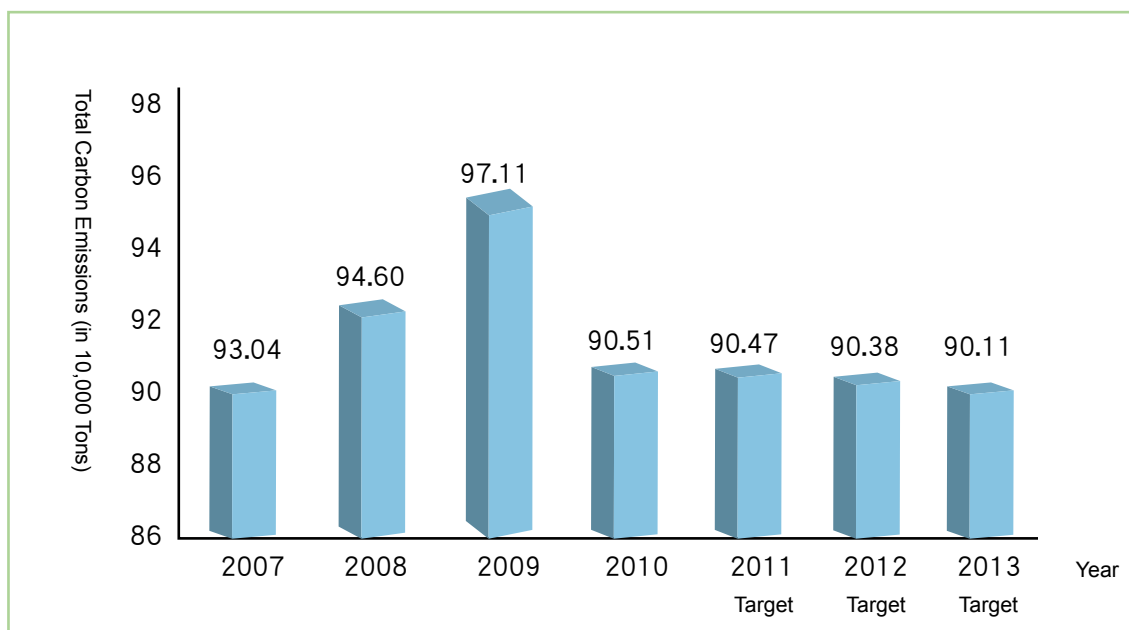
Carbon Management Targets

GHG emissions in 2012 have returned to 2007 levels (achieved ahead of schedule in 2010). Long term carbon emission reduction targets will account for the government's carbon reduction targets, which will return emissions to 2005 levels by 2020.

Targets of Chunghwa Telecom's Energy Conservation Plan



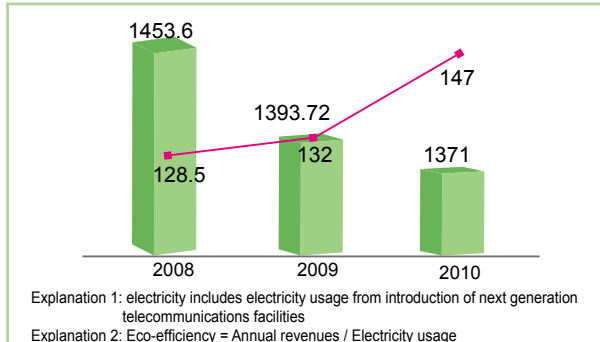
Targets of Chunghwa Telecom's Carbon Reduction Plan



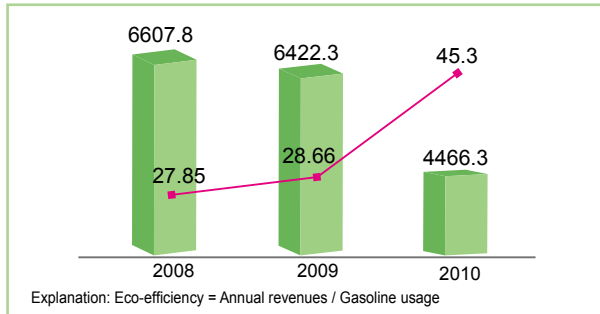
Overview of Environmental Impacts

Input

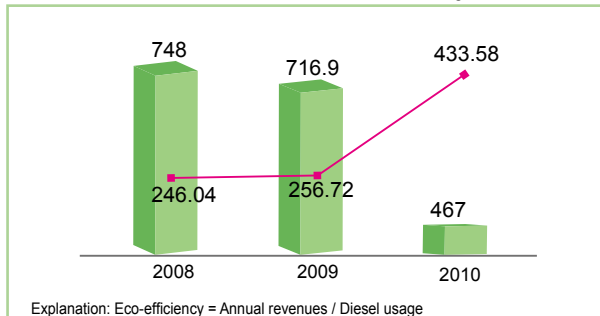
Electricity



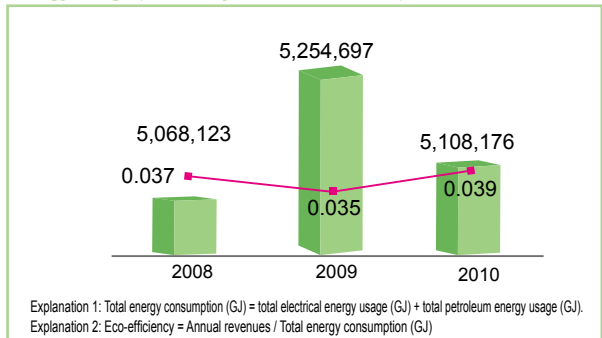
Gasoline



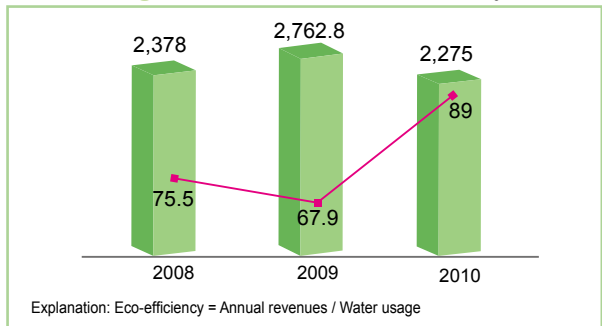
Diesel



Energy Usage (Electricity + Petroleum Fuels)

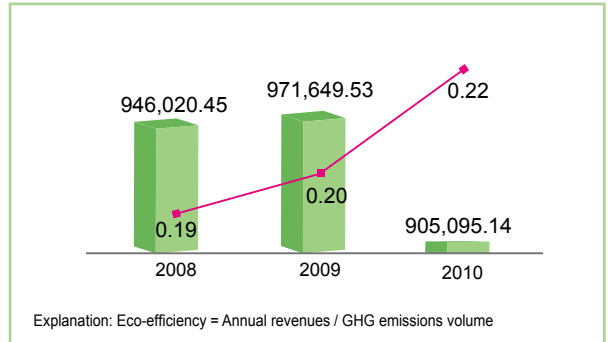


Water Usage

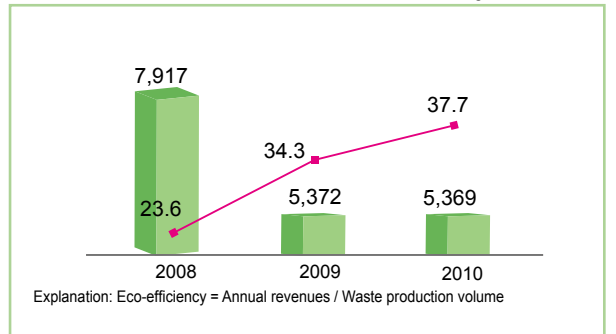


Output

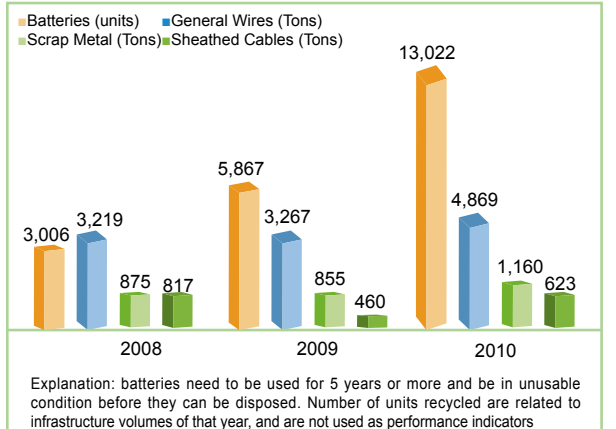
Greenhouse Gas Emissions



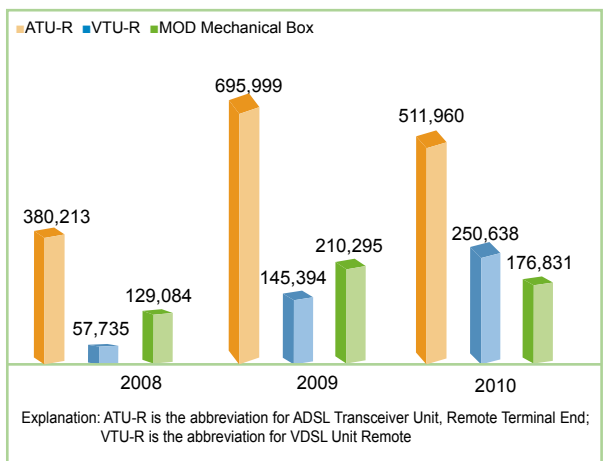
Waste



Scrap Metal Recycling Volume



End User Equipment Recycling Volume



Increasing Eco-efficiency

Eco-efficiency is proposed by WBCSD, aimed at improving more effective resource utilization and lower pollution emissions. This indicator allows an understanding of the conditions of a corporation's internal environment and business performance. In order to more effectively lower the environmental impacts from the telecommunications industry, and increase resource utilization, we have introduced many environmental energy conserving mobile products / services and programs, which can assist residential and commercial departments and the transportation industry with reducing carbon emissions.

Group Targets for Carbon Reduction

Our target is to reduce electricity usage and reduce petroleum fuel usage. The value behind such actions is reductions in operational electricity costs and reductions of group emissions of GHG. We plan to return to 2007 emission levels of 930,439.94 t-CO₂e by 2012, which we have achieved in 2010, where group electricity usage is 22,000,000 kWh less than 2009, while group gasoline usage is 84,125 L less than 2009, and diesel usage is 29,373 L less than 2009. Therefore, carbon emissions in 2010 were reduced by 13,731 t-CO₂e.

In 2010, we have invested NT\$ 20 million in energy conservation management for office towers. Meanwhile, energy conservation plans for telecommunications mechanical rooms include the following improvements: adoption of external air conditioning, high sensible heat air conditioning, increased mechanical room temperatures, use of frequency converters, and partial area lighting for mechanical rooms. NT\$ 9.79 billion is expected to be invested from 2010 to 2014. In 2010, energy savings totaled at NT\$ 57.20 million.

Carbon Reduction Results of 2009~2010

	Reduction in 2010 Compared to 2009	Carbon Emissions Reductions (tCO ₂ e)
Group Electricity Usage (kWh)	22,000,000	13,464
Group Gasoline Usage (L)	84,125	267
Group Diesel Usage (L)	29,373	
Total		13,731

Continuation of Environmental Protection and Energy Saving

We are not satisfied with merely achieving reduction targets. We continue to enhance promotions of energy saving operations with further hopes of helping the overall environmental transformation of the industry.

- Development of environmental sustainability EARTH systems to engage is carbon disclosure, carbon audits, carbon management, carbon reductions, and other low carbon lifestyle objectives.
- Signing energy conservation plans with the Bureau of Energy of the Ministry of Economic Affairs, which calls for electricity savings of 5% in 3 years.
- Encourage the government and global trends to engage in environmental protection and energy conservation activities: environmental affairs negotiation mechanisms for suppliers, supplier obligations for environmental protection and corporate social responsibilities, concrete commitment for creating green industry supply chains and product life cycle assessment systems, electronic waste recycling system plans, participation in Taiwan's environmental and ecological protection endeavors, engaging in green consumption to procure products labeled as environmental and energy saving.
- Promotion of green architectural action plan. Applications are made for green architectural certifications for all new buildings that cost NT\$ 50 million or more to build.
- Autonomous green energy in communications mechanical rooms: solar power generation, wind power generation, car and motorcycle reduction and retirement plans.

Expanding Green Procurement

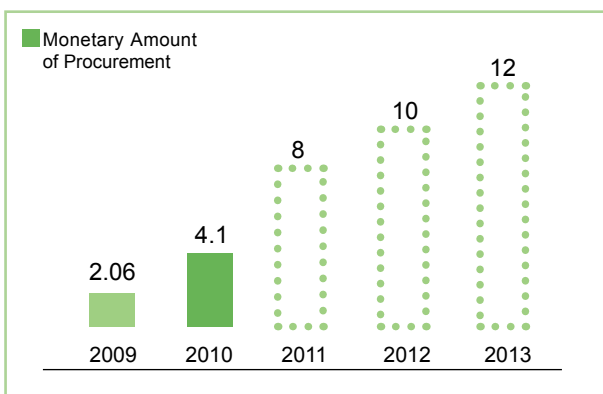
Chunghwa Telecom works with government policies to fulfill its corporate social responsibilities. We are fully promoting green procurement for all regional agencies, actively participating in the “Project on promoting private enterprises and organizations’ green purchasing activities” initiated by the Environmental Protection Administration of the Executive Yuan, and diligently investing in environmentalism and energy conservation among employees.

Promoting Green Procurement and Assistance in Creating Green Stores

We actively promote green procurement as we procure green environmental labels, energy saving labels, water saving labels, and green construction materials, sign green procurement agreements with private enterprises and groups, conduct green procurement seminars, etc., all of which are incorporated into annual budgets, with spending on such measures growing year after year.

We assist consumer cooperative commissaries of Northern Taiwan Business Group, Southern Taiwan Business Group, and Mobile Business Group in becoming green stores, while the Telecom Laboratories’ consumer cooperative commissary can also become a green store, making them the first private sector enterprise that joined the ranks of green stores as employee consumer cooperative commissaries.

Green Procurement Volume (in Hundred Millions of NT\$)



Note: amounts for 2009 and 2010 are actual, and amounts for 2011~2013 are budgeted.

Execution of Employee Environmental Protection and Energy Conservation Action Plans

Our employees gain a more meaningful understanding of climate change issues through education and awareness promotion, which helps harness consensus and promote internal carbon reduction actions for the company.

- Implement environmental education action plans to enforce the Environmental Education Act
- Encourage low-carbon commuting among employees: car-free days / carpools / public transit
- Holding “Environmental Protection and Energy Conservation Competition for Communications Mechanical Rooms and Offices”
- Implementation of “Internal Assessment of Energy Conservation Performance for All Operation Offices”
- Encourage environmental autonomy among employees
- Environmental education
- Donating second hand computers to charity or minority groups
- Creation of environmental protection, energy conservation, and charitable service volunteer teams



Green procurement can effectively expand a corporation’s economic, environmental, and social utility

Green ICT

“Green” not only represents environmentalism, but also high efficiency, social responsibilities, and low carbon lifestyles. It symbolizes visionary objectives that transcend world prosperity. “Green ICT” is regarded as an important tool with which to achieve carbon restriction objectives. Two widely advocated scopes include: supporting energy saving lifestyles with ICT technological applications, and energy saving, emission reducing, and high performance ICT products / systems.

Moving towards Green ICT

Governments, industries, and consumers in Taiwan are starting to focus on “energy and carbon reduction” issues. In the future, industry structures will also gradually develop towards low carbon industries. As part of the telecommunications industry, we can help other industries increase energy efficiency and reduce energy usage (such as smart energy saving services and video conferences), and moving towards green ICT is helpful for creating greater developments and profitable opportunities in the market for us in the future.

Internal Green Operations

- Consolidated bill transfer payments for nationwide water / electrical bills, and creation of electricity and water usage management information platforms.
- Using ODAS documentation systems to promote online document signing. Procurement bidding processes allow contractor electronic tendering and online electronic bidding, as well as allow agencies to upload bidding files and open online bidding services
- Promoting “electronic billing” services: customers are provided with online inquiry mechanisms for computers and cell phones, including bills owing, online payments, bill analysis management, etc.
- Telecommunications bill management: bills are merged to reduce paper billing, which reduces carbon emissions as well.

Primary Energy Saving Products / Services

- Autonomous research, development, and completion of “Intelligent Energy Network (iEN), which assists families, companies, and agency organizations with energy and carbon reduction to reduce electricity consumption.
- Selling energy and carbon reduction programs: including mobile video phones, mobile tour guides, mobile yellow pages, computer energy conservation, conference phones, video conferences, etc.
- Promoting “taxi dispatch services”: optimization of scheduling systems through satellite precision positioning, thus reducing vehicle gasoline consumption, and allows consumers to enjoy faster taxi services.
- Developing green energy saving products to reduce lighting electricity: development of LED-E27-9W lighting (expected cost recovery within 2 years).
- Providing “Unified Communications” (UC): provision of integrated services such as long distance instantaneous work communication, voice communication, application sharing, file sharing, personal computer video conferences, etc.
- Development of long distance medical care: integration of internal clinic resources through WiMAX broadband networks to engage in long distance diagnoses.
- Applying network technologies to integrate e-home care smart technology systems, material management, remote access home appliances, and other ICT contractor projects.
- Bill return records and clearance record procedures for HiNet clients of the Taiwan Clearing House: dedicated government research and development of land use systems that allow people to apply for land cadastre information online and receive electronic copies of such information.

Blueprint for Environmental Sustainability

In 2010, the Taiwanese government initiated the “National Energy and Carbon Reduction Plan” to set out priority benchmark plans according to the project’s policy orientation. Consumers have begun focusing on the developmental conditions of energy saving / green products from corporations, and developing products and services that help conserve energy is also helpful for raising our corporate image.

Encourage Economic Transformation

We are also working with the Taiwanese government in promoting the six new emerging industries, and will be devoted entirely to developing industry-tailored technology applications to assist corporations in developing towards green transformations. Therefore, we have planned environmental sustainability blueprints that are appropriate for our own characteristics. In the future, we will be focused on five major developmental aspects to fulfill our objective of creating a sustainable homeland

Investing in Green Futures

We will also start from supply chains and fully initiate green procurement plans. Starting from cloud facilities, we expect to invest NT\$ 40 billion in the next 5 years on cloud operations, which will be primarily focused on procuring cloud equipments with energy and carbon reduction and iEN smart system capabilities.

Five Major Aspects of Environmental Sustainability Blueprint

Environmental Disclosure	Energy Efficiency	Renewable Resource	Environmental Autonomy	Products and Services
<ol style="list-style-type: none"> 1. Continue carbon audits 2. Continue addressing relevant carbon information disclosure and environmental sustainability issues and producing reports 3. Continue increasing percentages of environmental expenditures 4. Engage in environmental sustainability awareness promotion and surveys for suppliers 	<ol style="list-style-type: none"> 1. Engage on consolidation of mechanical rooms 2. Build additional iEN systems 3. Engage in energy conservation of air conditioning systems 4. Use solar powered water heating equipments 5. Engage in recycling and reuse of water 6. Green construction: Chungwa Telecom Green Environmental Club 7. Develop environmental LED lights 	<ol style="list-style-type: none"> 1. Construct solar power systems 2. Construct wind power systems 3. Construct fuel cell power systems 	<ol style="list-style-type: none"> 1. Enforce green procurements 2. Use environmental energy saving vehicles 3. Use paper-free ODAS documentation systems 4. Incorporate ISO14001 management systems 5. Energy saving and environmental protection for offices 6. Energy saving and environmental protection for mechanical rooms 7. Health management systems 8. Account for car-free days 9. Account for Earth Day 10. Recycle and reuse industrial wastes 11. Create energy conservation service teams 12. Promote home cleanup activities 	<ol style="list-style-type: none"> 1. Provide electronic billing services 2. Provide ICT products / services for construction contractors 3. Provide iEN products / services for air conditioning 4. Enforce environmental management systems 5. Continue recycling cell phones 6. Continue researching and developing energy saving products 7. Assist suppliers with securing environmental labels for communications products