Business Creation in the Environment and Energy Fields

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Abstract

NTT's environment and energy producers seek to create businesses on themes concerning the world, society, and people based on products that help to protect the global environment by using environmental information and energy technologies. This article discusses the results of such business creation efforts during fiscal 2004 and possible directions in the near future.

1. Introduction

NTT's system of comprehensive producers, which was launched in July 2003, aims to turn R&D results into profitable business [1]. The environment and energy producers seek to create businesses based on themes concerning the world, society, and people based on products that help to protect the global environment by using environmental information and energy technologies in the 21st century, which has been called "the century of the environment". This involves contributing to efforts to:

1) Protect the global environment and create a society with less load on the environment,
2) Create more efficient industries and secure societies with an environmentally sound material cycle, and
3) Enhance people's performance and create safer and securer living environments.

While striving to contribute to global environment protection efforts based on the use of information technology (IT), which is one of NTT's specialties, the environment and energy producer also collaborates with relevant laboratories to promote research and development of environmental information and energy technologies on three main themes—being friendly to the world; creating a safer, securer, and better society; and supporting the people who achieve these things—and promotes business applications of the R&D results in the most efficient manner.

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2. Business fields

An overview of environment and energy businesses and research themes is shown in **Fig. 1**. There are two major global themes: preventing global warming, which includes CO_2 reduction and energy conservation, and protecting the global environment. There are two major social themes: the social environment and safety and security. The themes of zero emissions (reduce, reuse, and recycle (the 3Rs), green purchasing, etc.) and clean energy (solar power generation, fuel cells, etc.) are placed between the global and society themes because they can be regarded as social responsibilities for the global environment. There are two major themes concerning people: environmental management and environmental IT. Considering the future possibilities of these subjects, it is important to make the right selection of core research themes and strive to create businesses in a timely manner.

3. Efforts in fiscal 2004

Our business creation efforts in fiscal 2004 were mainly based on products developed the previous year. They included:

- Developing businesses related to public environmental IT systems [2] in collaboration with NTT Group companies,
- Commercializing multi-purpose portable power sources and developing applications of their element technologies,

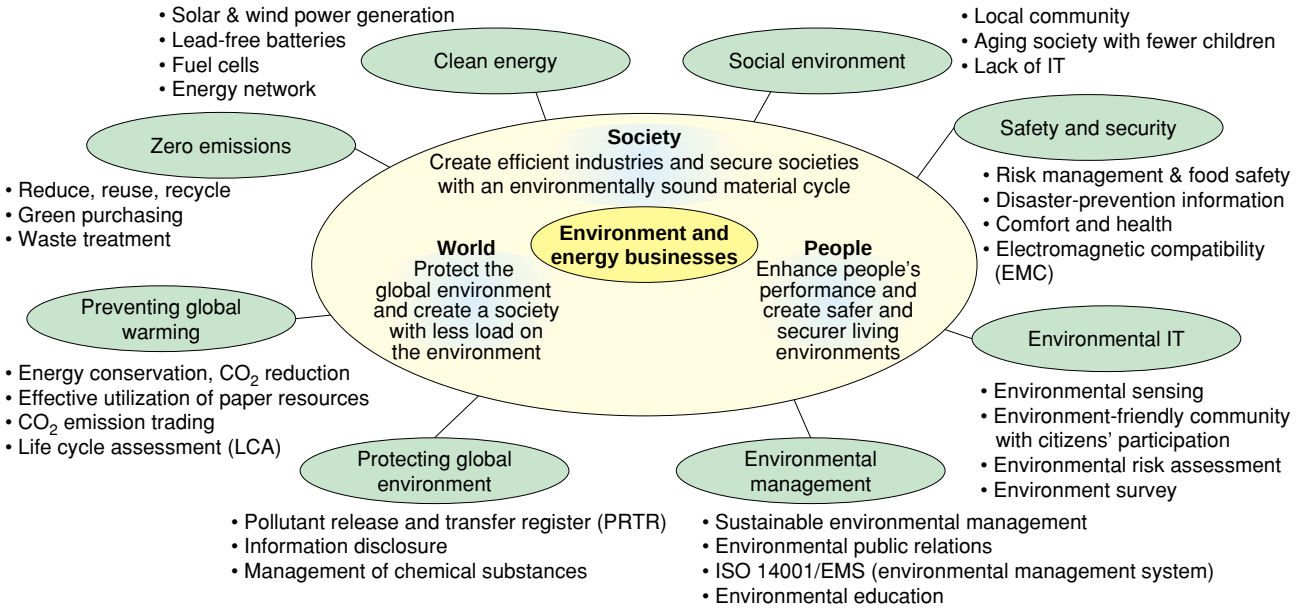

Fig. 1. Environmental business categories and research themes.

- Commercializing iDC (Internet Data Center) Shielded Vault [3] for electromagnetic security, and
- Developing a sustainable environmental management support system.

Public environmental IT systems consist of back-office products, including an environmental ledger system and air pollution monitoring systems, and front-office products, which are designed to provide such information to municipal employees and residents in a friendly manner. Some examples of public environmental IT systems are shown in **Figs. 2** to **4**. Figure 2 is an air pollution monitoring system used for monitoring air and water qualities. Previously, systems of this type used public telephone lines, which made it difficult to get measurements on a real-time basis because they had to be processed through loggers and transmitted periodically to collection servers. To solve this problem, we developed micro-loggers, which use existing local intranets and flat-rate-charged IP networks, and promoted business applications of the air pollution monitoring system using such loggers. The developed system has made it possible to send measurements to collection servers on a realtime basis. Moreover, by reducing the number of functions in the loggers, we were able to considerably reduce the overall price of these systems.

Figure 3 shows an environmental risk assessment system that assesses the risks of possible health hazards to humans from chemical substances discharged into the air and rivers from emission sources, such as

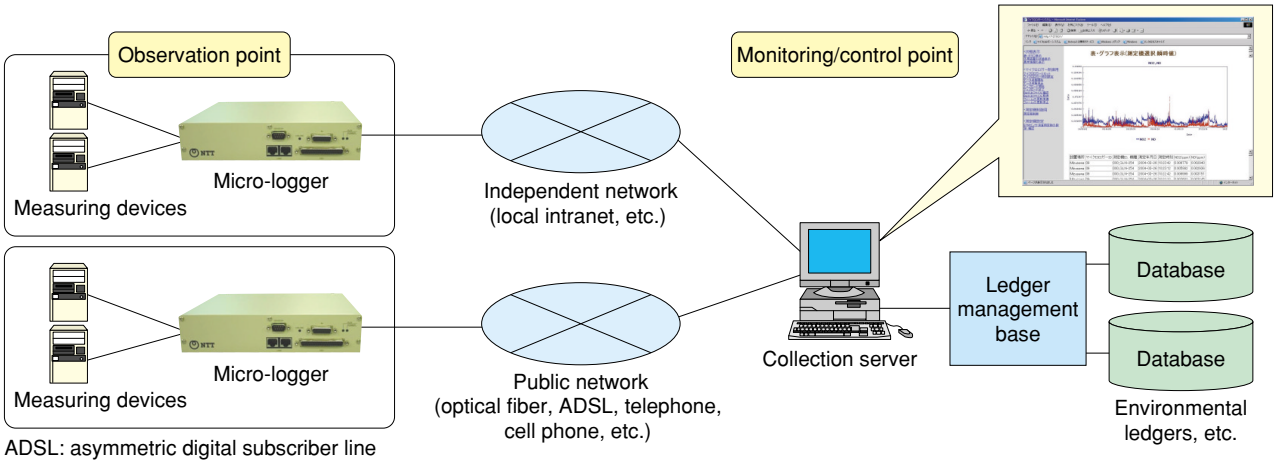

Fig. 2. Air pollution monitoring system.

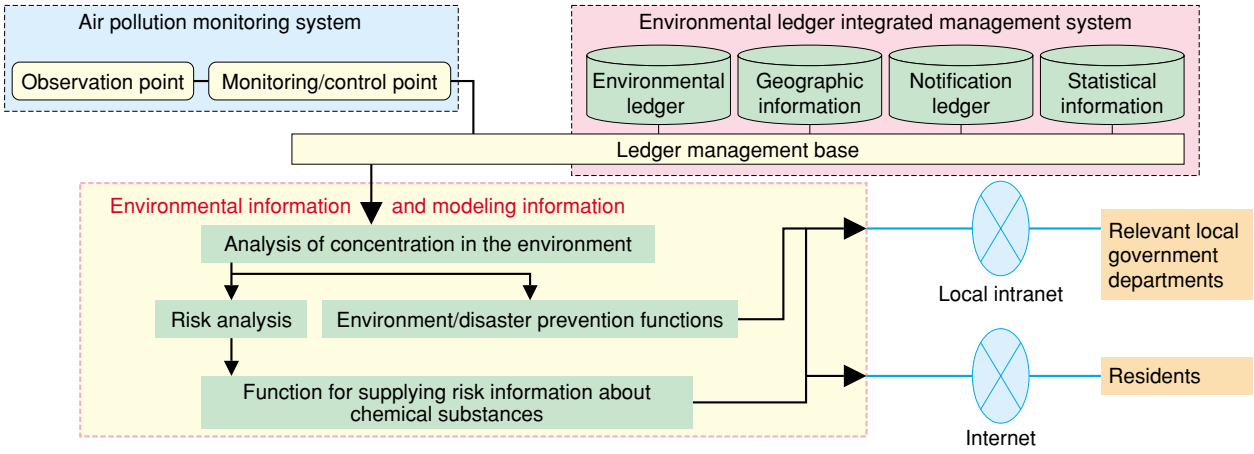

Fig. 3. Environmental risk assessment system.

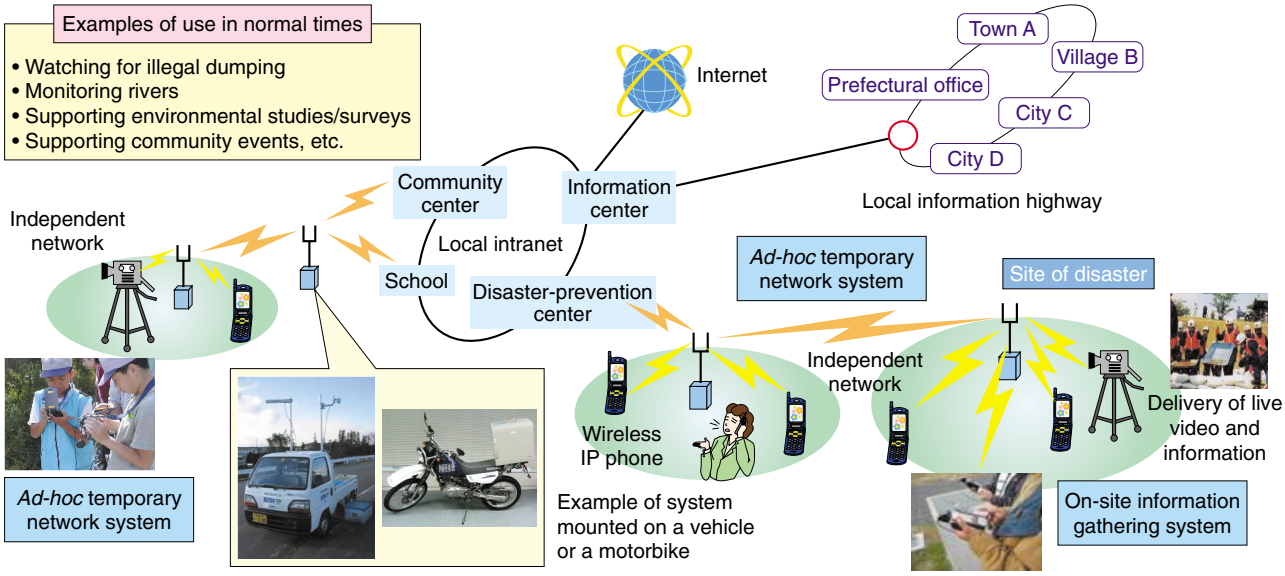

Fig. 4. Environment protection and disaster prevention monitoring system.

factories, by simulating their diffusion and estimating the intake of such substances by people. This system uses the environmental information from the above-mentioned air pollution monitoring system and geographic and statistical information from the environmental ledger integrated management system to analyze the concentration of chemical substances in the environment and their possible risks, so it is available for short-term risk assessments, such as in a time of disaster, and also for long-term statistical risk assessment. This assessment system works over the Web, making it possible to deliver assessment results via the Internet not only to the relevant people in municipal offices but also to local residents.

Figure 4 shows an environment protection and disaster prevention monitoring system. This system consists of an *ad-hoc* network system using a multi-hop wireless local area network that enables easy construction of wireless broadband networks anywhere at anytime and various applications that work on such networks. As an example, an on-site information gathering system is shown in Fig. 4. This system gathers information using a geographic information system (GIS) available at the sites of environment surveys, disasters, and illegal dumping and this information can be accessed via a computer, personal digital assistant (PDA), or cellular phone equipped with GPS (global positioning system). This system has already been introduced by many customers due to its simple on-site registration of data and photographic images overlaid on maps.

The *ad-hoc* network system consists of wireless

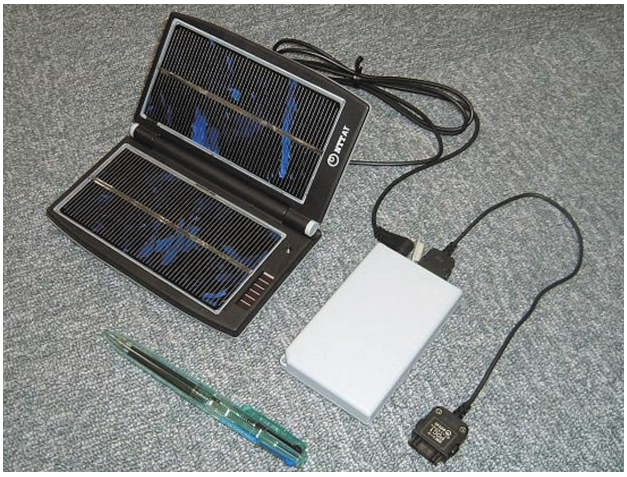

Fig. 5. Pocket Energy.

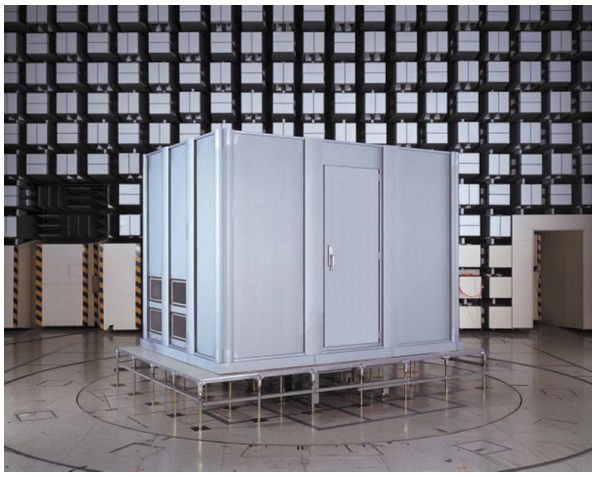

Fig. 6. iDC Shielded Vault (prototype).

switches, antennas, and batteries to establish a wireless connection between a local intranet and a disaster site or other target site using relays at intervals of about two kilometers. If a wireless IP phone is used, it is also possible to extend extension phones to the disaster site. As wireless switches are portable, they can be mounted on automobiles or motorbikes. During fiscal 2004, we conducted system demonstrations in cooperation with NTT Group companies during local government disaster prevention drills and at various exhibitions. As a result, we were successful in receiving contracts from several local governments.

We have developed a support system for sustainable environmental management for internal use. We calculated its ability to reduce the environmental load of IT services, and included the results in the environmental reports of NTT Group companies. We are also making continual efforts to raise awareness of the environmental load reduction effect as a strong advantage of introducing IT services.

A multi-purpose portable power source called Pocket Energy [4] (**Fig. 5**) was put on the market by NTT Advanced Technology (NTT-AT) and various electric appliance vendors in July 2004. This is a clean, compact, and high-power portable charging apparatus that uses sunlight. It can be used to charge cell phones, digital cameras, and other portable devices, making it a useful power source outdoors and in times of emergency. When a big earthquake occurred in Niigata Prefecture in October 2004, we supplied these power sources to victims as backup power supplies.

To promote business applications of the core technology of multi-purpose power sources (very low voltage boosting technology), we are addressing the possibility of introducing the technology to serve for solar powered self-sustaining power supply systems for environmental monitoring and power sources for nighttime advertisements.

The iDC Shielded Vault (**Fig. 6**) for electromagnetic security was announced to the press jointly by NTT Facilities and NTT-AT in September 2004, when the supply of highly reliable electromagnetic security solutions for constructing data centers began in collaboration with NTT Group companies. Developed to address electromagnetic security problems, such as TEMPEST* and electromagnetic attacks, the iDC Shielded Vault is an entirely new shielded room that provides protection against electromagnetic-wave-related problems. Conventional shielded rooms are expensive and take several months to construct. Moreover, they are less expandable, being unsuitable for use in rooms with raised floors or as an addition to existing data centers. Our iDC Shielded Vault, which can be built easily at low cost, is based on electromagnetic compatibility (EMC) evaluation technology acquired in the laboratory. It has four main characteristics: (1) Electromagnetic-wave shielding performance of 50 dB or more achieves at least 99.6% attenuation of electromagnetic waves, (2) it is applicable to existing equipment, providing additional earthquake resistance that can withstand a 6+ earthquake on the Japanese seven-point seismic scale and can be expanded by adding extra rack units, (3) the minimum construction can be as short as one day; and

* TEMPEST: a project code used by the US National Security Agency (NSA) for an information intercepting technology that reproduces the image on a monitor by demodulating the weak electromagnetic waves radiated from electronic devices.

(4) the construction cost is low because of the use of low-cost materials.

We are exploring possible applications of this product at new and existing data centers and server rooms to ensure electromagnetic security, and at data centers, offices and factories whose electromagnetic environment is deteriorating and could cause electromagnetic interference.

4. Future plans

To accommodate the rapidly increasing need for disaster prevention systems after the recent occurrence of several natural disasters in Japan, we intend to take products developed so far for environmental businesses and tailor them to suit disaster prevention, while also developing new products for that purpose. In particular, the environmental monitoring and information gathering/communication technologies acquired through environmental business activities can be applied directly to disaster prevention. We also plan to produce backup power supply systems for disaster prevention using clean energy systems based on nickel-metal-hydride batteries. We will continue to promote business applications of the above-mentioned products in close cooperation with NTT Group companies while striving to create new businesses using the latest environmental and energy technologies.

References

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[3] http://www.ntt.co.jp/news/news04e/0409/040927.html
[4] http://www.ntt.co.jp/news/news04e/0402/040213.html

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