

# Environmental Policy of Private Company

November 29, 2010  
NEC Corp.  
Env. Mng. Division  
Ryosuke UGO



## Structure of the Lecture !

- ◇ Nov. 29 (Mon.)
  - Part 1 Information input for Environmental management activities – NEC's activities
  - Part 2 - Exercise : Practice for CO2 reduction estimation of IT solutions
  - Short preparation for the next lecture
- ◇ Dec. 6 (Mon.)
  - Part 1 Debating of Team 1 & 2
  - Part 2 Debating of Team 3 and Closing discussion on the sustainability for private companies



## The Points of my Lecture !

1. How should the IT manufacturer work on Global warming ?
2. How much can IT contribute to the CO2 reduction ?
3. Discussion – Debating
  - Are the following system and the mechanism for effective for the CO2 reduction?
  - Carbon Tax, - Carbon Offset, - Carbon trading system,
  - Carbon , - CCS, - Biomass, etc.



# NEC's Environmental Strategy "Ecology through IT"

~ NEC's Environmental Vision 2010 ~

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## Input information contents

1. NEC Corporate Profile
2. NEC Environmental Management Vision
3. Environmental Management activities
  - (1) Continuous reduction of environmental loading
  - (2) Eco-Products development
  - (3) Eco-Solutions & Service
4. The NEC Way ~ NEC's environmental policy

## 1. NEC Corporate Profile



## Profile

Company Name: NEC Corporation  
 Address: 7-1, Shiba 5-chome, Minato-ku, Tokyo, Japan  
 Established: July 17, 1899  
 Chairman of the Board: Kaoru Yano  
 President: Nobuhiro Endo

Capital: ¥ 397.2 billion - As of Mar. 31, 2010 -  
 Consolidated Net Sales: ¥ 4,215.6 billion  
 - Fiscal year ended Mar. 31, 2009 -  
 ¥ 3,581.3 billion  
 - Fiscal year ended Mar. 31, 2010 -

Operations of NEC Group: IT Services, Platform, Carrier Network,  
 Social Infrastructure, Personal Solutions,  
 Others

Employees: NEC Corporation  
 24,871 - As of Mar. 31, 2010 -  
 NEC Corporation and Consolidated Subsidiaries  
 142,358 - As of Mar. 31, 2010 -  
 Consolidated Subsidiaries: 310 (Japan:118, Oversea:192) - As of Mar. 31, 2010 -



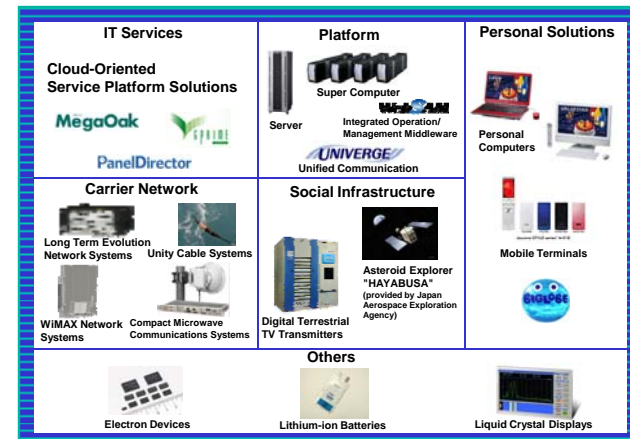
Kaoru Yano



Nobuhiro Endo

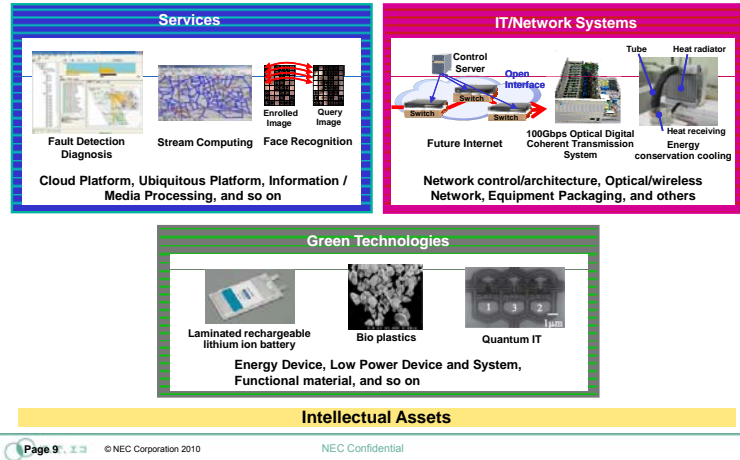
Financial results are based on accounting principles generally accepted in Japan.

## Business Domains and Their Chief Products and Services



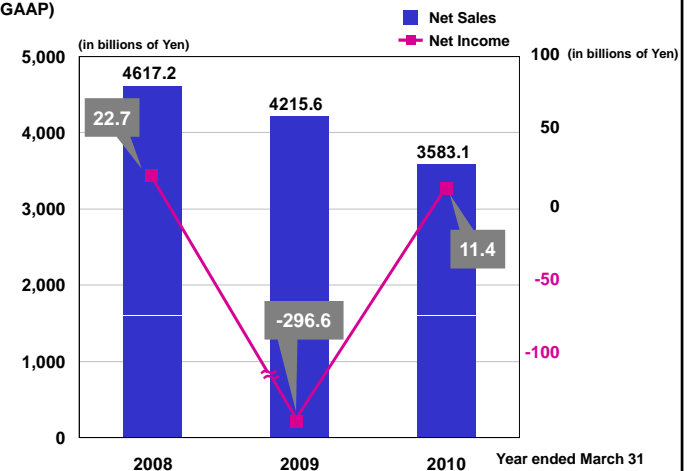
## Research and Developments Aimed at an Information Society friendly to Humans and the earth

Creation of New Business, Basic Research to Create Future Business, Reinforcement of Intellectual Assets



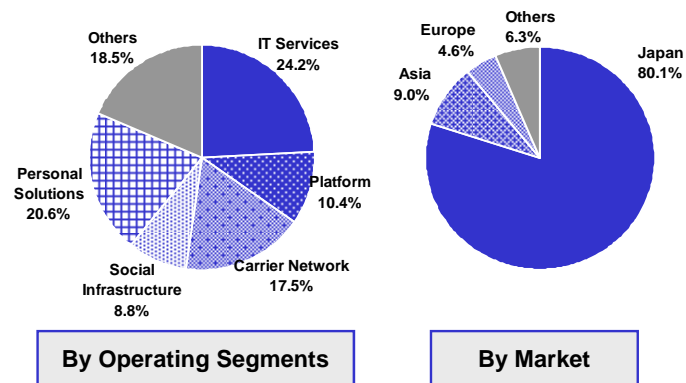
## Net Sales and Net Income (NEC Corporation and Consolidated Subsidiaries)

(Japan GAAP)



## Proportion of Sales

[ Fiscal year ended March 31, 2010; ¥3,583.1 billion ]



## 2. NEC Environmental Management Vision



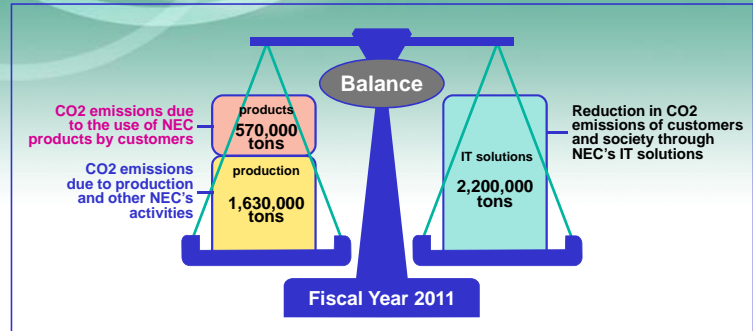
# Approach to Corporate Social Responsibility **NEC**

Sustainable Development of Society and the NEC Group Through The NEC Way



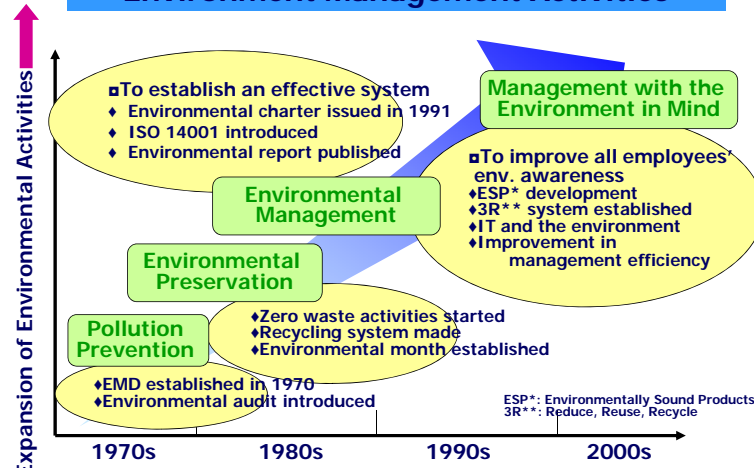
# Address Climate Change and Environmental Protection 1 **NEC**

Reduce net CO2 emissions to zero in FY2011



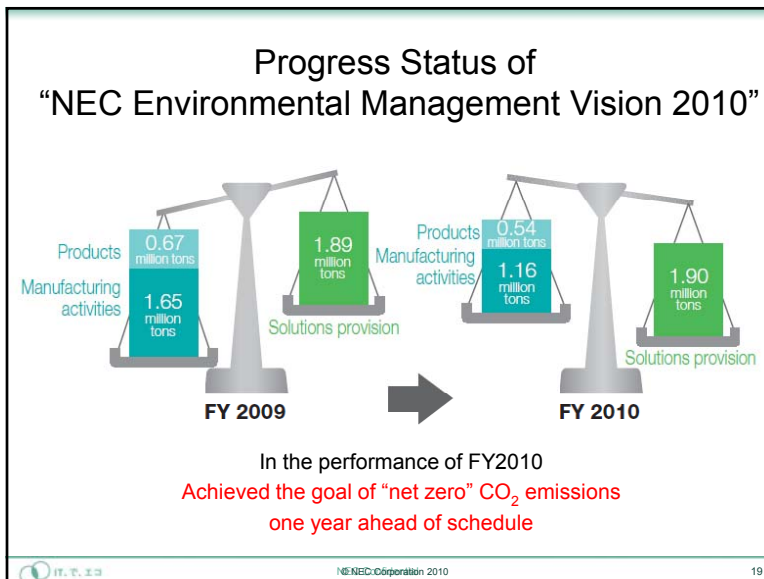
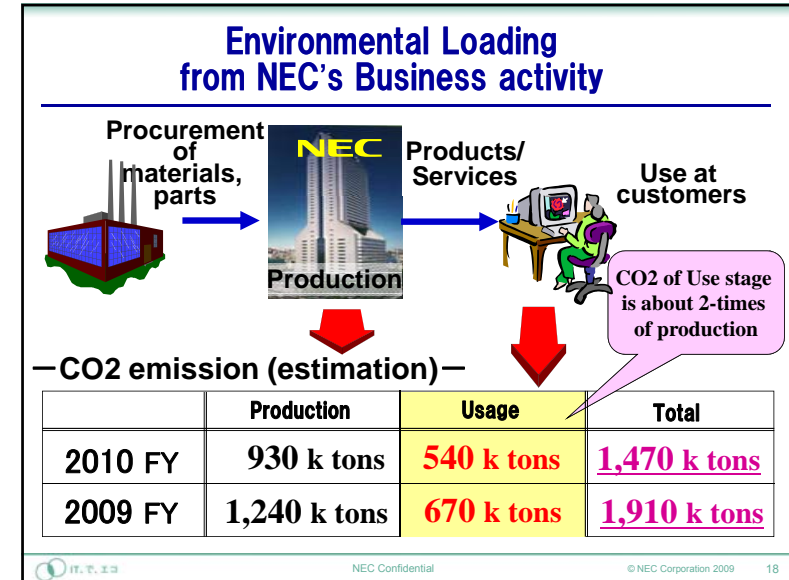
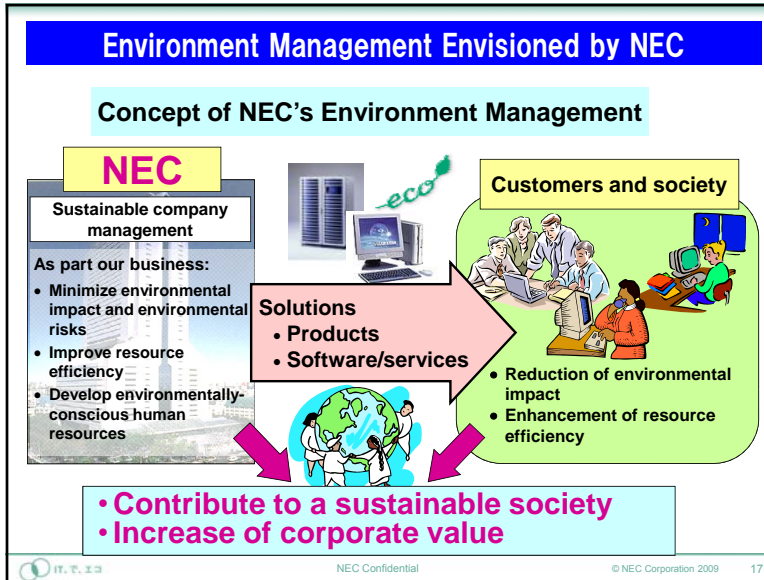
- Reduce direct CO2 emissions in production and other activities
- Promote energy-efficient IT equipment for our customers to reduce CO2 emissions
- Reduce CO2 emissions of customers and society through NEC's IT solutions

## Trend of NEC's Environmental Management Activities



## History of NEC Environmental Activities

	NEC Efforts	Historical Events
1970	- Pollution Prevention and Environmental Management Div. established (1970) - Environmental management began (1972) (Corporate Environmental Guidelines, Corporate Environmental Committee, Environmental Audits, Environmental R&D)	- Pollution Problems in Japan (1950s - 1960s) - Environmental Agency established (1971) - Declaration of UN Conference on the Human Environment (1972)
1980	- Zero Waste Campaign started (1985)	- Montreal Protocol on Substances That Deplete the Ozone Layer adopted (1987)
1990	- NEC Environmental Charter enacted (1991) - ODS* eliminated (1993) - NEC Eco Action Plan 21 released (1993) - Product Assessment Guidelines issued (1994) - ISO14001 obtained (1995) - Environmental Reports issued (1995) - Eco Symbol (NEC's eco label) introduced (1998) - Lead-free PC launched (1999)	- Energy Star Program started in US (1993) - Basic Environmental Law established in Japan (1993) - ISO14001 went into force (1996) - COP3 held in Kyoto (1997)
2000	- designated as wide-area recycler (2001) - Zero emissions achieved in NEC Group (2002) - "NEC Environmental Management Vision 2010" released (2003) - Bio Plastic Mobile Phone launched (2006) - "REAL IT COOL PROJECT" started (2007)	- Home Appliance Recycling Law enacted (2001) - PC Recycling Law went into force (2003) - Kyoto Protocol entered into force (2005)



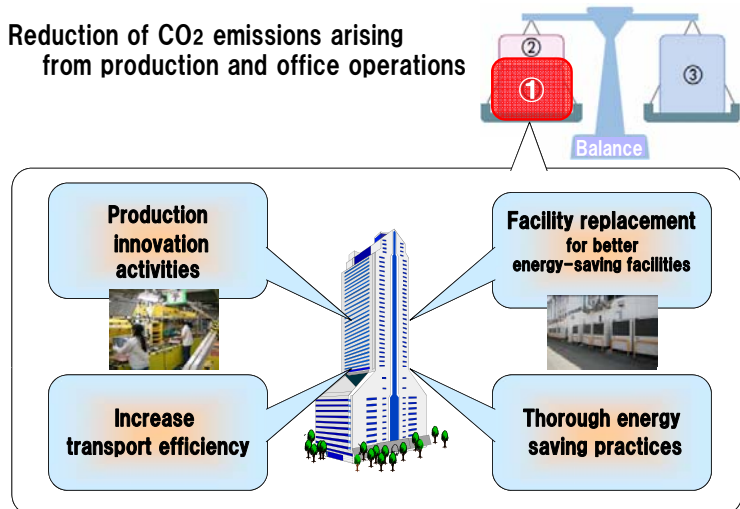
## 3. NEC Environmental Management Activities

### (1) Continuous reduction of environmental loading

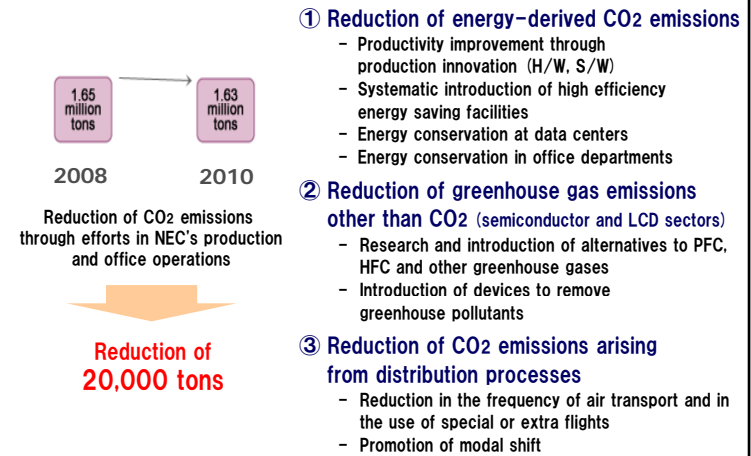
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## Reduction of CO2 emissions arising from production and office operations



## Efforts toward NEC Environmental Management Vision 2010 Production and Office Operations



## Use of IT in "Production Operations"

A case of successful CO2 reduction during the production of personal computers

- Production innovation activities have been implemented since 1997.
- BTO production / cell production / Toyota Production System + introduction of advanced IT

Introduction of RFID: Eliminated a substantial amount of work such as scanning of bar-codes, (from October, 2004) which was previously performed as much as 100,000 times each day

Before introduction of RFID



Workers scan bar codes printed on paper-based manufacturing instructions



RFID card



Manufacturing instructions are displayed on a screen by simply placing a RFID card near the antenna

In addition to over 10% improvement in productivity as well as enhanced product quality, **5,300 tons reduction** in annual CO2 emissions was achieved in FY 2006 through overall production innovation activities, compared to the FY 2002 level.

## Reducing CO2 Emissions in Plants

### Mandatory energy conservation measures in NEC Group

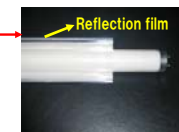
Item Classification	Number of items
A Common items	5
B Items related to combustion facilities such as boilers	22
C Air conditioning facilities	30
D Dedicated power generation facilities and cogeneration facilities	2
E Power substation and distribution facilities	8
F Pumps	6
G Fans and blowers	6
H Compressors	16
I Electric furnaces and aging devices	5
J Lighting facilities	8
K Lifts	2
L Hot water supply facilities	1
M Office equipment (personal computers, printers, etc.)	1
<b>Total</b>	<b>112</b>

### Example: Introduction of a gas heat pump air conditioning system (Nagano)

- Heat pumps driven with a LPG-fueled gas engine
  - Energy savings of 90% compared to an electric air conditioning system with equivalent performance
- **CO2 reduction effect: 73.4 tons/year**

### Example: Application of reflection films for increased illumination: reduction in the number of light bulbs used (Fukushima)

- Reflection films are applied to the fluorescent lights along the production lines (illumination 20 W → equivalent of 40 W)
  - Applied to 40 W fluorescent light bulbs on all floors (8,000 bulbs) → increased illumination allowed the removal of 400 light bulbs
- **CO2 reduction effect: 51 tons/year**



## Reducing CO<sub>2</sub> Emissions in Offices

**Energy conservation measures in office buildings**  
"Energy Conservation Report Card"

Item Classification	Number of items
A Air conditioning load (buildings and equipment)	8
B Heat source facilities (turbo, gas absorption, DHC, etc.)	5
C Pumps	3
D Air conditioning device (air blower)	3
E Air conditioning facilities	5
F Ventilation facilities	2
G Cold and hot water supply facilities	3
H Electrical systems	8
I Building-related, and other	5
<b>Total</b>	<b>42</b>

**Example: Introduction of a daylight responsive lighting control system (Tamagawa Renaissance City)**

**Example: Switching of lighting fixture ballasts to a more energy efficient model**

Input current 0.42 (A) Input power 85 (W)	<b>25% reduction</b>	Input current 0.32 (A) Input power 63 (W)
--	----------------------	--

**Reduce CO<sub>2</sub> emissions from offices by up to 14% (10,000 tons) by FY 2011**

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## Forestation Operations in Australia - NEC Forest -

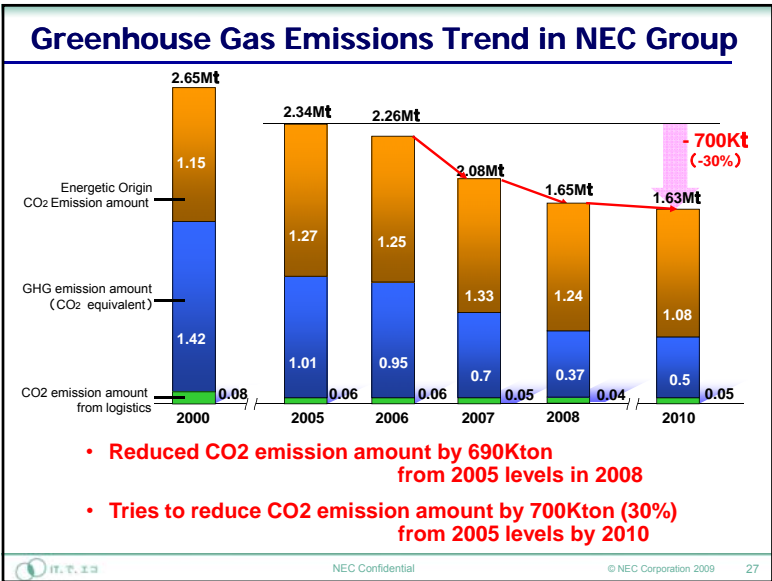
### As an effort to absorb CO<sub>2</sub> through trees

planting operations (2002)      Growth to 10m in 3.5 years (2006)

◎ Summary of NEC Forest

- **Period of Plantation** : from 2002 to 2011 more 10years Growth
- **Place** : on Kangaroo Island, in South Australia
- **Total surface area** : 30 million m<sup>2</sup> (equivalent to some 2,300 times of the Tokyo Dome)
- **Absorption of CO<sub>2</sub>** : 1 million tons of CO<sub>2</sub> in the 20 years

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## (2) Eco-Products Development

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## Efforts toward NEC Environmental Management Vision 2010 Energy Conservation in Products

670,000 tons → 570,000 tons

2008 → 2010

Reduction of CO2 emissions in the use stage through energy efficient products

Reduction of 100,000 tons

① Reduction of power consumption of products and IT & network infrastructures

- Improvement of product performances, e.g. transmission speed and information processing capabilities
- Development of high-efficiency devices
- Development of energy saving control software
  - Enhancement of environmental technology development
  - Creation of environmental "top-runner" products

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## Environmental Awareness in All Business Processes

Waste reduction (reduction in costs and environmental impact)

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## NEC Eco Products Strategy

Performance

Quality

Cost

Design

+

Ecology

Global warming prevention

CO2 reduction

(energy reduction, ex. during product use, standby mode)

Environmental consciousness

Control of Hazardous substances

(Pb, 6<sup>th</sup> chromium, Hg, Cd, etc.)

Resource recycling

Promotion of recycling

(Reduce/Reuse/Recycle)

Consideration of the entire product life cycle incl. product design, production, shipping, use and scrapping

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## NEC's Standards for Eco Products

Eco Products

- Satisfy the 29 Eco-Product Standards
- ✓ **Global warming prevention:** Energy-saving design, etc. Server: Express 5800
- ✓ **Resource recycling:** 3Rs, easy assembly, longer use, etc. Super computer: SX-8
- ✓ **Making products green:** Avoidance of hazardous substances, RoHS compliance, etc.
- ✓ **Environmental management systems:** ISO certification at the manufacturing sites
- ✓ **Manufacturing process**
- Implement product assessments
- Secure transparency in product environmental information Pasolink

Top-level products

#ISO14021 Type 2: Self-Declared Environmental Claims

Eco-Symbol\* Products

7,915 products in 91 product categories (as of March 2009)


- Satisfy the 13 Eco-Symbol Requirements
- ◆ Calculate CO<sub>2</sub> emissions for all product-lifecycle processes
- ◆ Adopt eco plastics, ex. recycled plastics, bio-plastics
- ◆ Introduce proactive environmental technologies for products
- ◆ Be environmentally superior to conventional products and competitors' products, etc.

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## Market-Leading Eco Products

### - Monitors with Carbon Meter -




**MultiSync Series (EA241WM) :**  
**CO2 reduction: 66% less**  
 = ca 30kg/year,  
 = JP¥1,700/year

#### ECO MODE




#### Carbon Meter



Indicate CO2 reduction amount by ECO MODE

### - ECO CENTER, Energy-Saving Server -

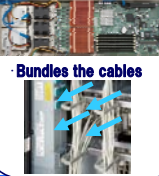


**Electric power: 55% less**  
**Space: 50% less**  
**Weight: 58% less**

**2 meters tall and 540 kg with a 128-core processor & 512-core capabilities**

#### For Better Airflow

Optimizes the parts' locations



Bundles the cables

highly efficient batteries  
power-saving technologies

- Power-saving CPU
- Power-saving chipsets
- Power-saving memory

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## Examples of Energy-Saving Design

<http://www.nec.co.jp/eco/en/business/development/conserve/index.html>

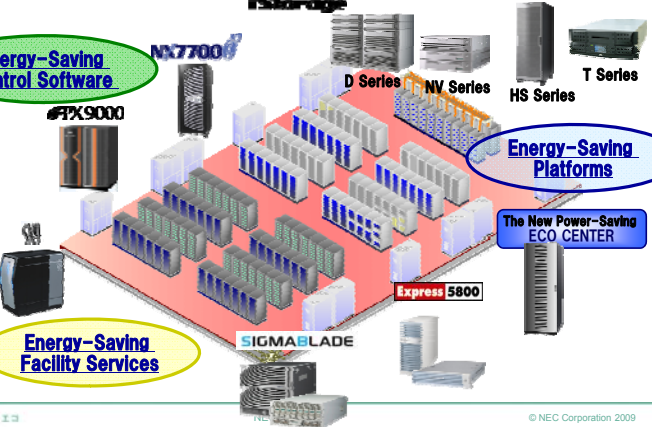
Product Series	Energy Reduction Rate	Energy-saving measures
Personal Computer: <b>Mate Type MF</b>	53% ↓	· Application of the ECO MODE
Server: Express5800 Series <b>ECO CENTER</b>	54% ↓	· A power-saving quad-core CPU and components · High power-conversion efficiency of 89%
Grid Storage for enterprise: <b>iStorage HS8-20</b>	63% ↓	· Application of Massive Array of Inactive Disks (MAID) Technologies
Broadband Router: <b>WR8150N</b>	87% ↓	· Application of the ECO MODE · High power-conversion efficiency · A power-saving devices
Access Router : <b>UNIVERGE IX2025</b>	53% ↓	· Shutdown setting function installed in each port · Use of power-saving components · High-efficiency power supply (switching mode)
Super Compact Microwave Communication System Unit <b>PASOLINK NEO High Performance</b>	92% ↓	· Optimization of the heat release structure · Performance improvements in high integration and high speed

## “REAL IT COOL PROJECT”

A series of programs and activities for the development and provision of technologies, products, and services that **reduce the power consumption of customers' IT platforms**

Launched in Nov. 2007

Energy-Saving Control Software



Energy-Saving Platforms


The New Power-Saving ECO CENTER

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## Development of Advanced Bio-Plastic Technologies


1. Utilize bio plastics to maintain high biomass content and product safety.

Poly(lactic acid) (PLA) resin



To prevent depletion of oil as well as global warming

PLA with kenaf fiber added




Bio-plastic mobile phones (March 2008)

Biomass content: 90% (#1 in the world)

Double the heat resistance & impact resistance.

Flame-retardant PLA




Metal hydroxide added

To be utilized for PCs


2. Create new functions to improve a product's added value.

Shape-memory PLA




Wearable products

ECO



Having shape memory and recyclable

Heat-conductive PLA



Heat releasing with cross-linked carbon fibers in resin

液晶デバイス 電子機器部材

Good for thin and small products

Future

Use uneatable biomass.

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## Development of Li-Ion Battery for Electric Vehicles

### Automotive Energy Supply Corp. (AESC)

a JV of NEC and Nissan for the mass production of Li-ion batteries

- Use manganese for lithium-ion batteries instead of cobalt or nickel.
- Reduce CO<sub>2</sub> emissions by 70% (compared with those for a Kei car) to achieve a 2,817 t-CO<sub>2</sub>/year reduction when introducing 3,000 e-vehicles.
- Emit zero pollutants (NOx & SOx).



Global Warming Prevention Activities in 2006  
Award of State Minister for the Environment

In 2006  
NEC Environmental Award

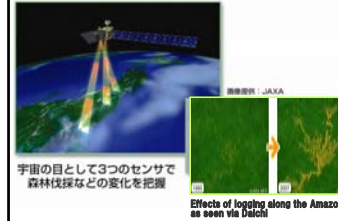
AESC plans to manufacture  
100,000 Li-ion batteries in 2010.

R1e: 10 km/kWh = 0.410 kg of CO<sub>2</sub>/kWh  
Kei car: 17.7 km/L = 2.32 kg of CO<sub>2</sub>/L

## Visualizing Environmental Problems

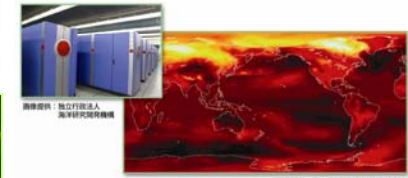
Helping Bring Better Insight to the Mechanism of Global Warming

### Dalchi: An advanced land-observing satellite



Effects of logging along the Amazon, as seen via Dalchi

### Earth Simulator



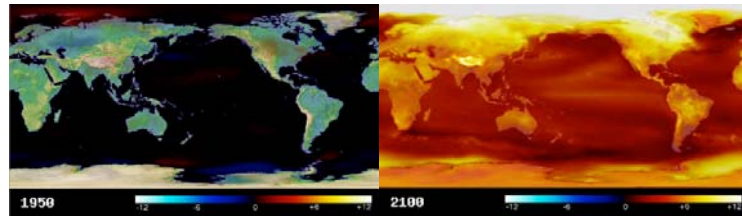
地球温暖化など地球規模の現象を解明・予測

Monitor the current earth.

Predict the future earth.

By monitoring environmental changes to forests, landforms, and sea temperatures, NEC's products contribute to making people aware of global environmental changes, which leads them to take action.

## Global Warming Forecast by Earth Simulator



In 1950  
average temperature  
13.8°C

In 2100  
average temperature  
17.0°C~21.0°C

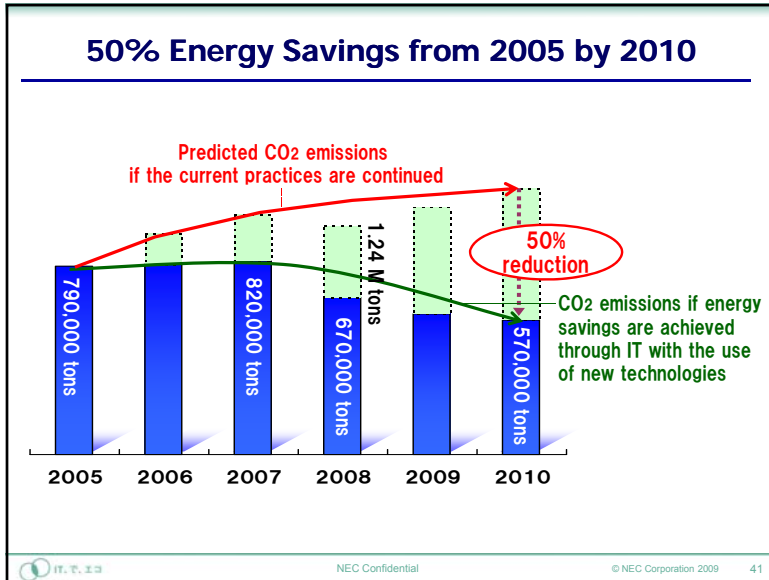
Source :  
Center for Climate System Research, University of Tokyo,  
National Institute for Environmental Study,  
Frontier Research Center for Global Change,  
Research Revolution 2002

## Mid-Term Targets and Results for Eco Products in 2008

2008: April 1 of 2008 - March 31 of 2009

Indicator	Items	Mid-Term Targets		2008 Targets	Results in 2008
		Targets	Target Year		
Environmentally Sound Products	1 Reducing CO <sub>2</sub> emissions at product use (based on performance) -CO <sub>2</sub> emissions reduction rate	50% or more (2005 reference year)	2010	30 %	45 %
Top Runner Eco Products	2 Developing of top runner environmental products	7 products	2010	3 products	3 products
Environmentally-sound Products	3 Making all new products Eco-symbol products -Ratio of products with Eco-symbol (Includes new products from 2007)	100%	2008	100 %	99 %
Resource Recycling	4 Greater use of Eco-plastics for external device container plastic -Eco-plastic usage	72%	2010	75 %	75 %
	5 Promoting use in bio-plastic products Bio-plastic [PLA materials] (usage)	More than 10%	2010	-	-

Mid Term Targets for Eco Solutions, Eco Plants and Offices, and Eco Communications.



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## (3) Eco-Solutions & Service

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### Ecology through IT : Provision of Eco Solutions

Reduction of CO2 emissions by Web-based conference

CO2 Emission Amount: Approx. 79% reduced

Handouts: 50 papers x 10 people / a meeting  
 PC, Projectors: (80W + 350W) x 8H / a month  
 Travelling by trains: 2 persons each from Osaka, Nagoya, 6 persons from suburban area of Tokyo

No handouts  
 Server: 320W x 8H / a month  
 PCs: (20W x 5 PCs) + (60W x 5 PCs) x 8H / a month  
 Network: 0.7 GB x 10 people / a meeting

Storage  
 Server and PCs use

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### Efforts toward NEC Environmental Management Vision 2010 Contribution to CO2 Reduction by IT Solutions

1.89 million tons (2008) → 2.20 million tons (2010)

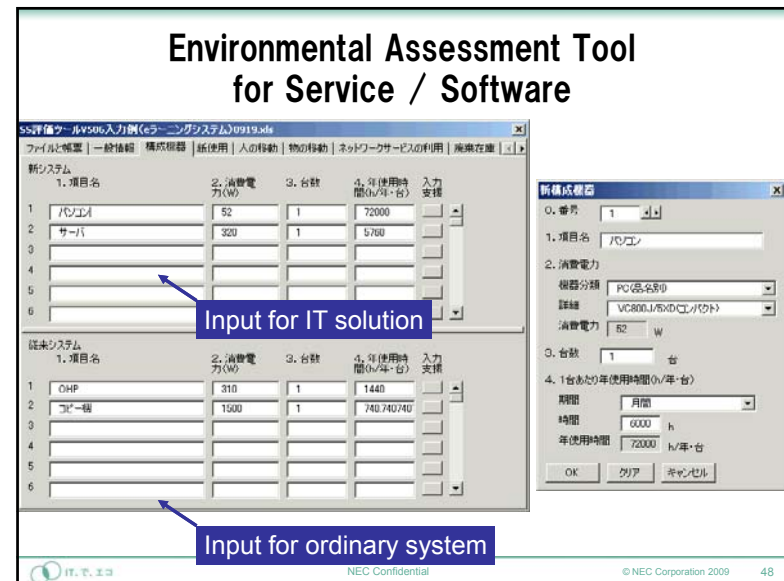
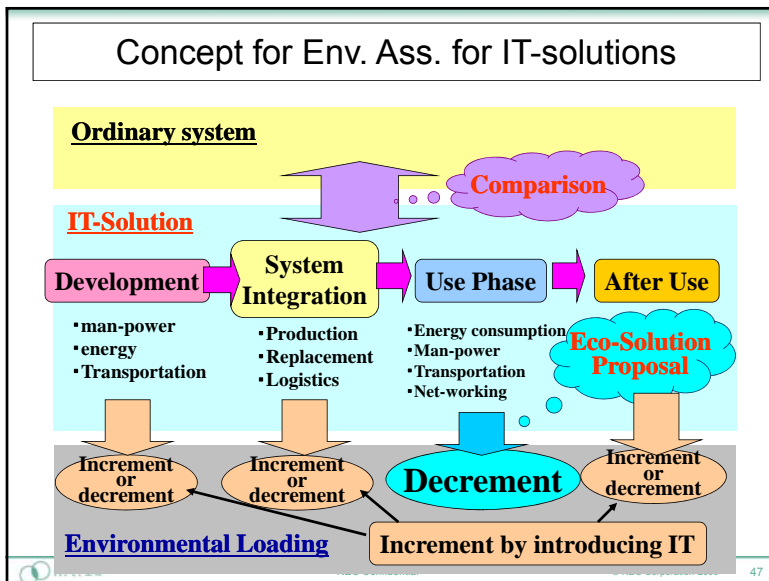
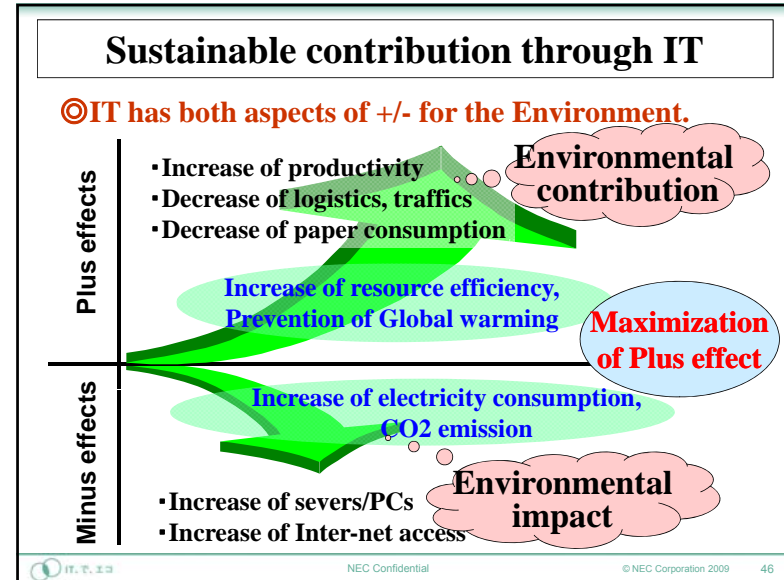
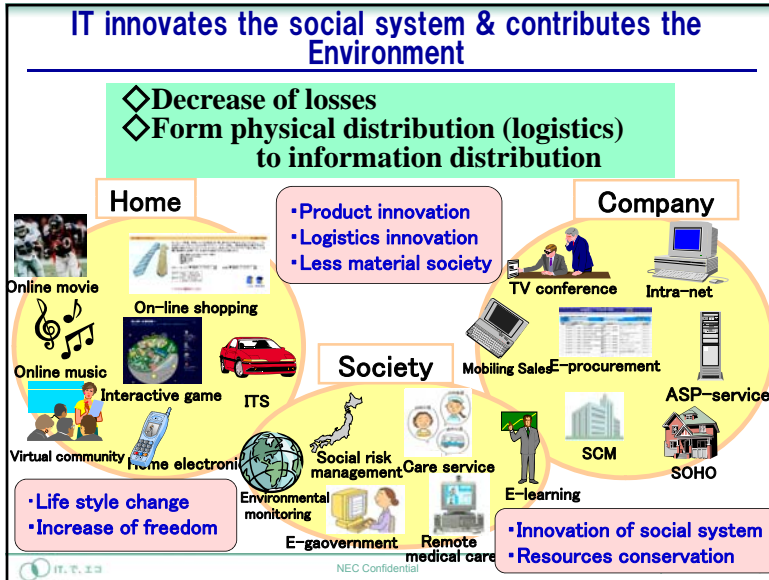
Contribution to the reduction of CO2 emissions through providing IT solutions

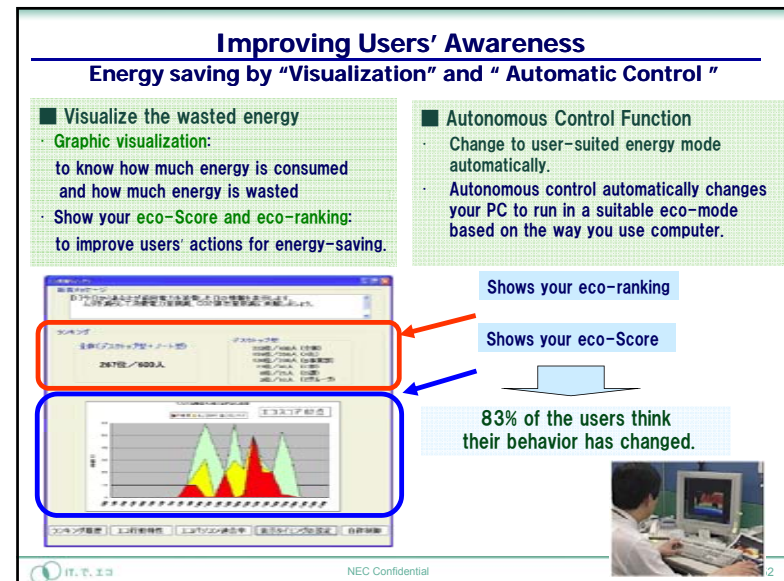
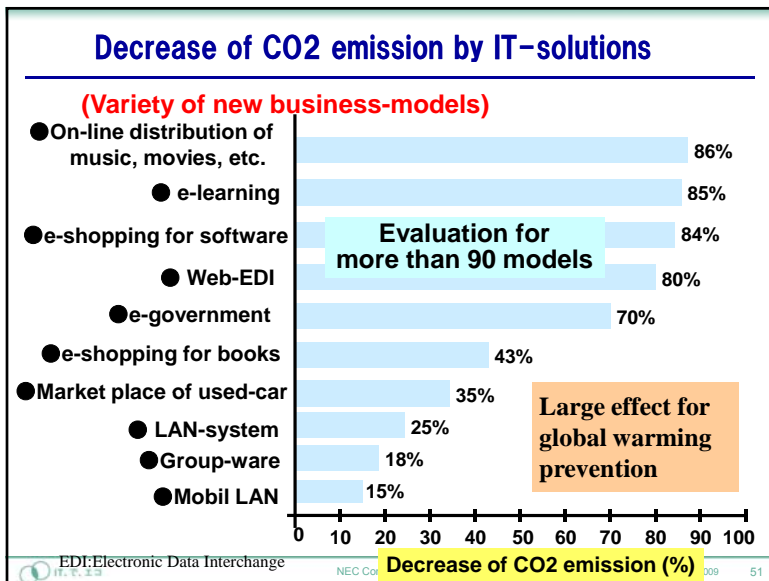
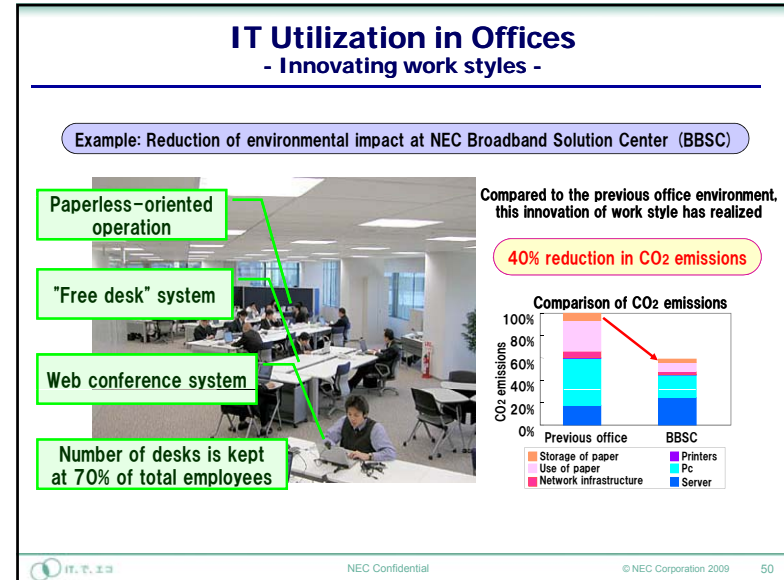
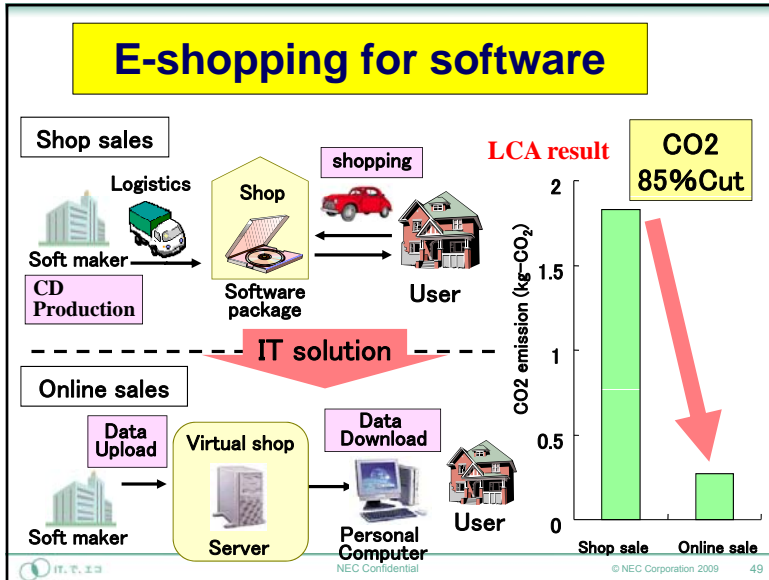
Increase of 0.31 million tons

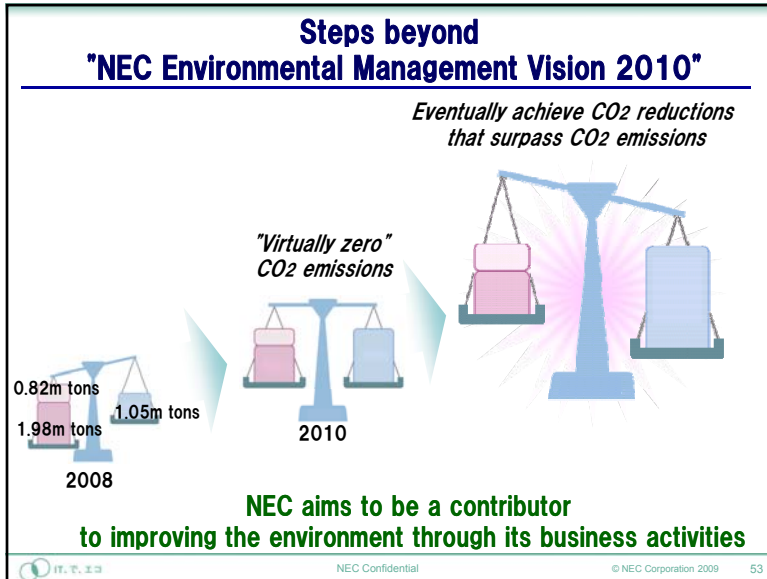
- Innovation of work and life styles**
  - Provision of broadband office, satellite office and mobile office infrastructures
  - Support for production innovation through the utilization of RFID
  - Provision of e-learning infrastructure, etc.
- Innovation of social infrastructure**
  - Provision of infrastructure for Intelligent Transport Systems (ITS)
  - Provision of telemedicine system infrastructure, etc.
- Contribution to energy conservation through cross-industrial application of technologies**
  - Automobile control system LSI
  - Lithium-ion secondary batteries for electric and hybrid vehicles, etc.

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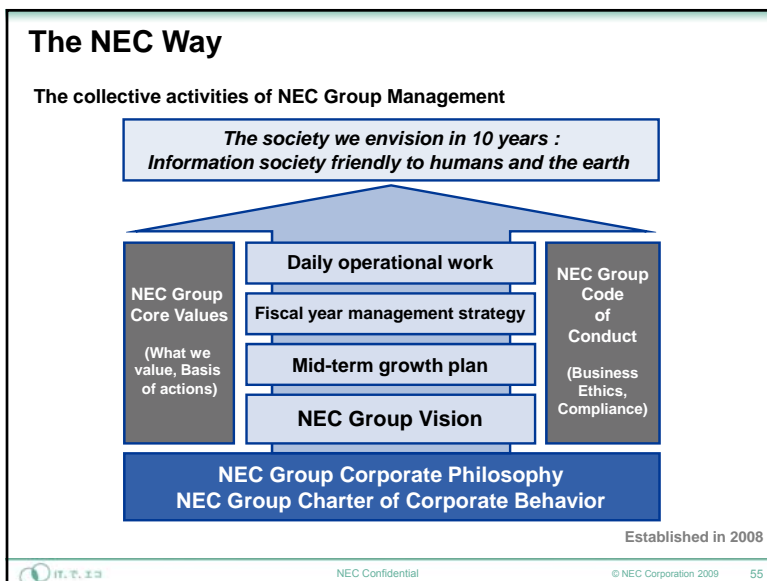




## 4. The NEC Way

~NEC's environmental policy~

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### Corporate Philosophy

**NEC strives through "C&C"  
to help advance societies worldwide  
toward deepened mutual understanding  
and the fulfillment of human potential.**

Established in 1990

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## NEC Group Vision 2017

**To be a leading global company  
leveraging the power of innovation  
to realize an information society  
friendly to humans and the earth**

Established in 2008



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## Environmental Charter

### Environmental Principles

**NEC will contribute to a sound environment  
and a livable society  
through technology that harmonizes  
with nature and production  
that is environmentally friendly.  
Our vision is a world where our natural  
environment  
is preserved, enabling all people of the world  
to pursue their full potential.**

Established in 1991



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## Environmental Charter

### Action Plan

Preamble to the NEC statement for environmental action  
NEC will make harmony with the environment one of its primary goals  
so that each individual within the company will act with this in mind.  
Respect and preservation of the environment is our priority.

1. To produce energy and resource saving products, while giving careful thought to environmental and safety issues in development and planning.
2. To encourage the development of environmental technology on all levels: production, sales, distribution, use and disposal of a product. To introduce materials, engineering and recycling methods that will minimize adverse effects on the environment.
3. To respect and adhere to national and regional environmental regulations. To strive to strengthen and enforce even stricter environmental NEC standards.
4. To contribute positively to society through an environmental management program with a global perspective, while educating and raising the environmental consciousness of all company members.
5. To provide a structured administrative organization for environmental management, with executives in charge of different areas, delegate responsibilities, and be in the forefront of environmental matters at all times.
6. To maintain and strengthen an independent environmental management, and implement improvement measures based on internal environmental company audits.
7. To contribute to environmental protection, by continuously making public announcements on the latest NEC developments in environmental technologies and management methods.



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その変わるところに NEC のソリューション

## (Ecology through IT)

**★ We are helping customers and society as a whole  
contribute to environmental conservation through  
our IT businesses.**



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