Fujitsu Group's Environmental Management

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TRENDS IN GLOBAL ENVIRONMENTAL ISSUES

Sustainable Development Goals (SDGs)

- An international agenda consisting of 17 goals with 169 targets, to promote action to change the world after 2015. Adopted by the UN General Assembly in September 2015.

- Sets comprehensive goals for both developing nations and developed nations, not only for social issues, but across the three fields of the economy, society and the **environment**.

Environmental Goals in SDGs and the Role of Business

- The SDGs include many fields where efforts are required even in developed nations, such as action on climate change and sustainable production and consumption.

- In the private sector, there is a need for creativity and innovation to resolve these issues.

Goals related to the environment

6. Clean **water** and sanitation

7. Affordable and clean **energy**

11. Sustainable cities and communities

12. **Responsible consumption and production**

13. **Climate** action

14. Protection of marine resources

15. Protection of flora and fauna
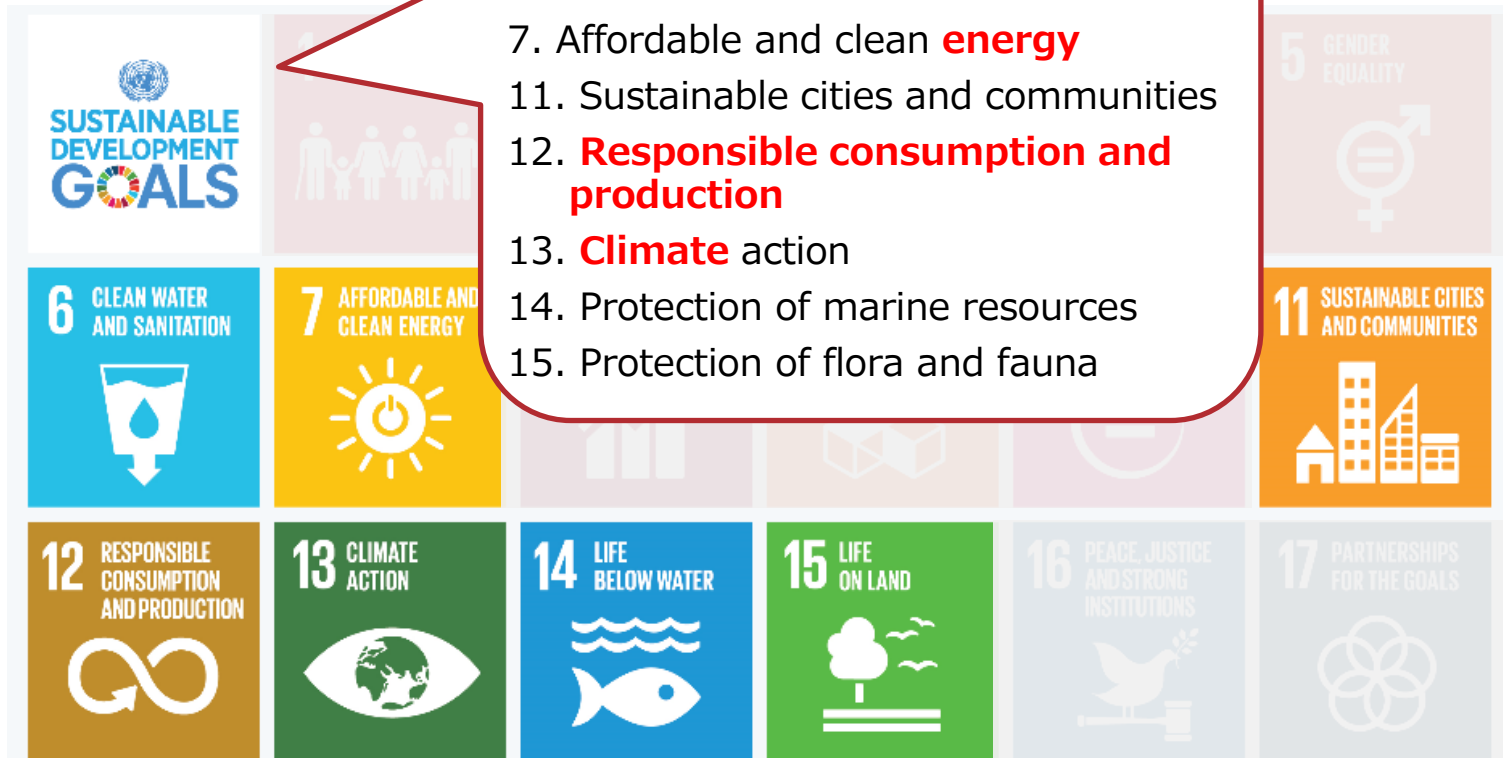
Accelerating Countermeasures against Climate Change at COP21

*COP21 = 21st Conference of the Parties of the United Nations Framework Convention on Climate Change

- By including the countries that were previously not actively involved in global warming countermeasures, collective environmental investment is expected to gain momentum. European and American companies are already moving to seize this business opportunity. (Expanding business to developing countries)

Points of the "Paris Agreement"

- Sets common global long-term goals, such as **not only the 2 °C target, but working toward 1.5 °C**, peak emissions output as soon as possible, and efforts to achieve a balance of emissions and absorption in the second half of this century
- **All countries should produce and update reduction targets every five years**, and report on the status of implementation for review
- Implementation of a structure (Global Stocktake) to **review the state of progress for the whole world every five years**
- Not only will developed nations continue to provide funds, but developing countries will voluntarily provide funds
- **Improving our ability to adapt** to the negative effects of rising temperatures

Source http://envirobeat.com/ (left) http://www.philly.com/ (right)

Fujitsu Supports the COP21 Agreement

FUJITSU

- ## Supporting the Paris Pledge for Action

  - The Paris Pledge for Action is an expression of support for the COP21 Decision and its implementation. Its contents promote broad participation at a high level.

  - As of Dec. 16, over 800 companies and organizations support it
    http://www.parispledgeforaction.org/whos-joined/

  - Japanese companies: Fujitsu, Ricoh, Toshiba, Kokusai Kogyo, Takeda Pharmaceuticals, Teijin, Sony Mobile

  - Japanese local governments: Gifu, Tokyo, Yokohama

The Paris Pledge for Action

"As cities, regions, businesses, investors, civil society groups, trade unions and other signatories, coming from every sector of society and every corner of the world, we realize that dangerous climate change threatens our ability and the ability of future generations to live and thrive in a peaceful and prosperous world. We also realize that taking strong action to reduce emissions can not only reduce the risks of climate change but also deliver better growth and sustainable development.

As a result, we the undersigned, affirm our strong commitment to a safe and stable climate in which temperature rise is limited to under 2 degrees Celsius.

In support of this, we welcome the adoption of a new, universal climate agreement at COP21 in Paris, which is a critical step on the path to solving climate change. We pledge our support to ensuring that the level of ambition set by the agreement is met or exceeded.

We will do this by taking concrete steps now, and without waiting for the entry into force of the agreement in 2020, both individually and cooperatively, to reduce greenhouse gas emissions to a safe level and build resilience against those changes already occurring.

We will look back at this moment as our turning point, when the transition to a low-emission and climate resilient economy became inevitable, irreversible and irresistible. We must, we can and, together, we will solve climate change."
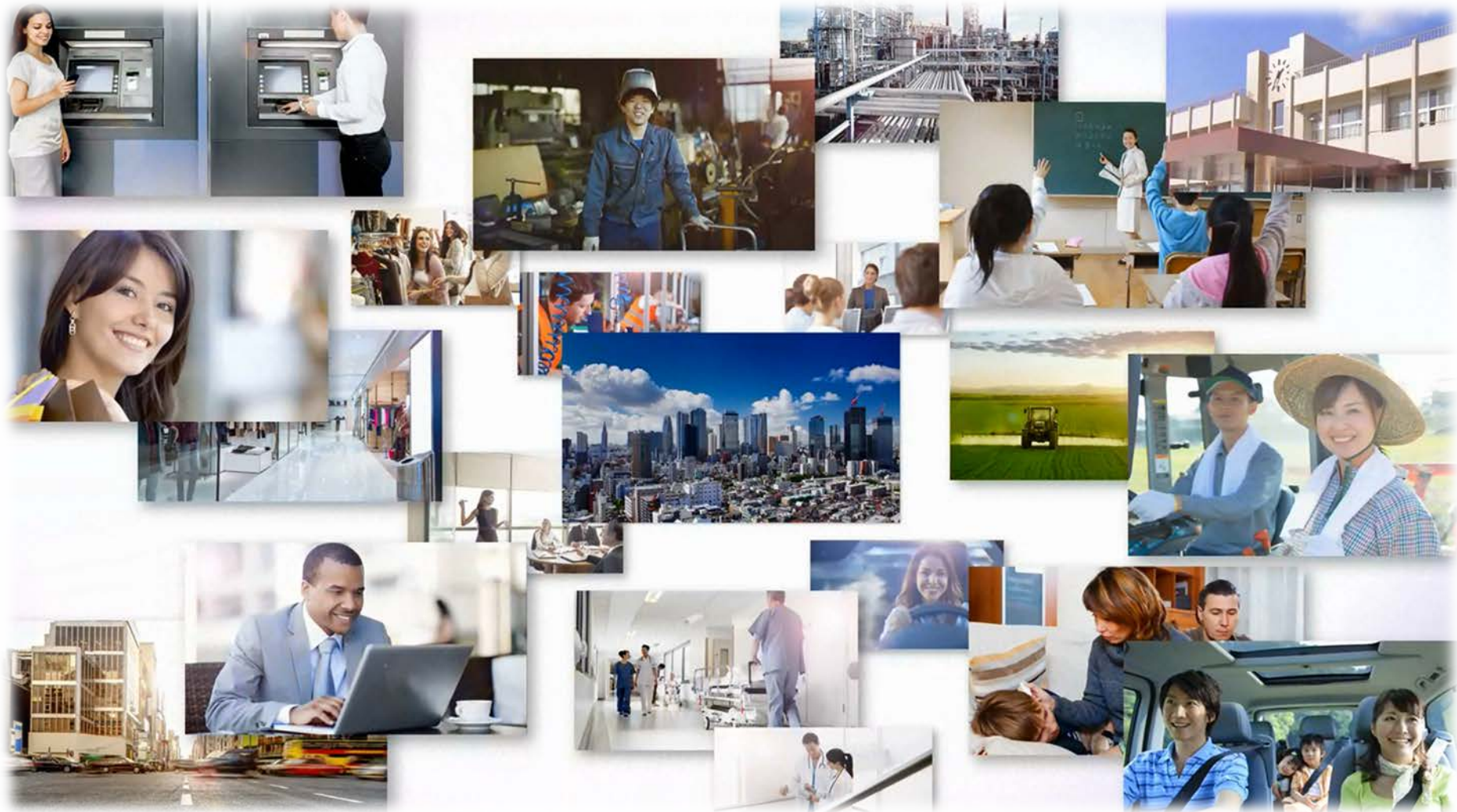
PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

http://www.parispledgeforaction.org/read/
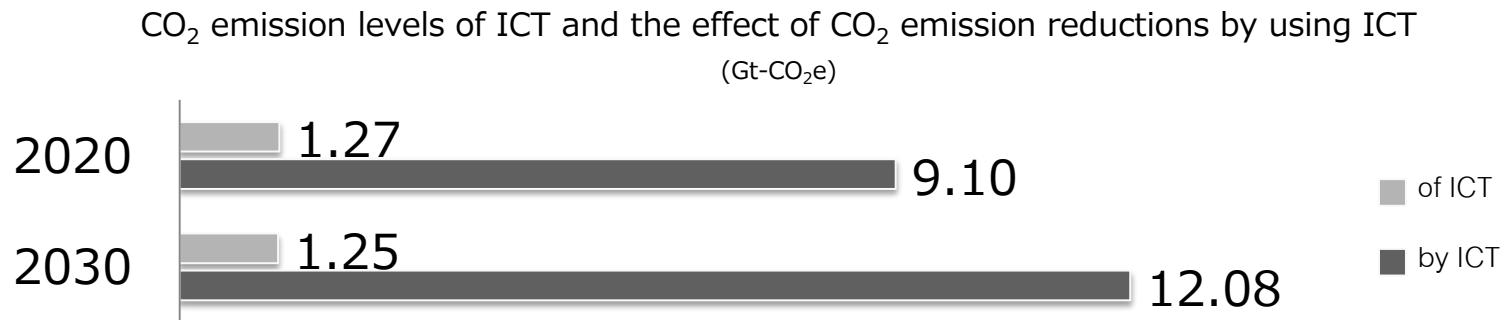
FUJITSU GROUP'S ENVIRONMENTAL MANAGEMENT

Human Centric Intelligent Society

Contributing to the building of a safe, abundant and sustainable society through the use of ICT

Approach to Environmental Management

- As the growth of ICT continues, greenhouse gas (GHG) emissions caused by the use of ICT devices increase (of ICT)

    → Increase the importance of Fujitsu's own environmental friendliness

- At the same time, by using ICT, it can contribute to the reduction of GHG emissions of society as a whole (by ICT)
- Contributions of ICT and by ICT are both necessary. However, **the impact of contributions by ICT is much greater than those of ICT.**

CO_2 emission levels of ICT and the effect of CO_2 emission reductions by using ICT

(Gt-CO_2e)

	of ICT	by ICT
2020	1.27	9.10
2030	1.25	12.08

Graph created by Fujitsu on the basis of SMARTer2030, published by the Global e-Sustainability Initiative

Fujitsu Group Environmental Action Plan Stage VII (FY 2013-15)

- A further expansion of <u>contributions to the environment through leveraging ICT</u> (by ICT)
- Reductions in the environmental burden due to Fujitsu Group's own business activities

Results of the Environmental Action Plan Stage VII

FUJITSU

	Target items (by the end of FY 2015)	Results from FY2013	Results from FY2014	Achieved
Contribution to Society	✓ Reduce greenhouse gas emissions for our customers and society by a total of over 38 million tons.*	10.86 million tons	24.83 million tons	✓
	✓ Increase the deployment of sustainability solutions.	Prepared action frameworks. Set a definition and criteria, and identified solutions.	Identified 12 solutions that contribute to sustainability to strengthen our solutions portfolio in the field of climate change, and gathered case studies.	✓
	✓ Achieve top-level energy efficiency of more than 50% for newly developed products.	39.0%	46.0%	✓
	✓ Increase resource efficiency of newly developed products by 35% compared to 2011.*	Increased by 21.3%	Increased by 33.6%	✓
	✓ Develop innovative technologies that enable solutions and products to reduce the environmental load.	Announced 18 key green technologies.	Announced 25 key green technologies.	✓
	✓ Support initiatives that address complex social and environmental challenges, e.g. biodiversity conservation.	Provided funding, technology, and human resource support.	Provided funding, technology, and human resource support.	✓
	✓ With society, support our employees' volunteer social activities.	Employees dedicated 129,000 hours to social contribution activities.	Employees dedicated 145,000 hours to social contribution activities.	✓

*Target revised upward at the end of fiscal 2014

Results of the Environmental Action Plan Stage VII

FUJITSU

	Target items (by the end of FY 2015)	Results from FY2013	Results from FY2014	Achived
Our Business	✓ Reduce greenhouse gas emissions in our business facilities by over 20% compared to 1990.	Reduced by 29.4%	Reduced by 33.1%	✓
	✓ Improve energy intensity in our business facilities over 1% each year.	1.6%	5.1%	✓
	✓ Improve environmental performance of our major data centers.	Established the Green Datacenter Committee. Set internal targets.	Formulated Guidelines for Promoting Environmentally Conscious Datacenters. Adopted PUE visualization tools	✓
	✓ Reduce CO_2 emissions per sale from transport over 1% (on average) compared to FY2013.*	Reduced by 32% (*result under the previous goal)	Reduced by 13%	✓
	✓ Expand activities of reducing CO_2 emissions to all types of suppliers.	Reached 95.9% of business partners implementing CO_2 reduction/limitation measures.	Reached 100% of business partners implementing CO_2 reduction/limitation measures.	✓
	✓ Increase generation capacity and procurement of renewable energy.	Installed 210 kW of new solar power generation facilities. Purchased approx. 23,000 kWh of green power.	Concluded an agreement to purchase solar generated electricity in the U.K. Purchased approx. 21,000 kWh of green power.	✓
	✓ Continue efforts for efficient use of water, e.g. water recycling and water saving.	Water usage: 18,620,000 m^3(reduced by 6.3% compared to FY 2012)	Water usage: 16,600,000 m^3(reduced by 10.8% compared to FY 2013)	✓
Continuous Targets	✓ Reduce chemical emissions to less than the average level of 2009-2011 (PRTR: 21t, VOC: 258t).	PRTR: 21 t; VOC: 246 t	PRTR: 19 t; VOC: 219 t	✓
	✓ Reduce the amount of waste to less than average level of 2007-2011 (amount of waste: 31,134t). ✓ Keep Zero Emission in factories in Japan.	Waste generated: 23,522 tons Achieved zero emissions at domestic business sites.	Waste generated: 22,258 tons Achieved zero emissions at domestic business sites.	✓
	✓ Maintain over 90% resource reuse rate of business ICT equipment at Fujitsu recycling centers.	92.7%	94.3%	✓

* As the initial target was achieved, from FY 2014 the Fujitsu Group has changed the target.

Using ICT to Help Customers Reduce Their Greenhouse Gas Emissions

■ By optimizing the infrastructure of a datacenter at an educational institution, we improved the learning environment and reduced electricity consumption.

- University wanted to increase students and offer more attractive educational program "expand the learning environment and improve infrastructure"

- Fujitsu improved network environment by consolidating 96 servers to two storage units. →Performance doubled
(FUJITSU Storage ETERNUS DX80)

- Virtualized nearly 100 physical servers onto five Fujitsu Server PRIMERGY RX300 units.
→Reduced power consumption by 80%
→Reduced floor space utilization by 70%
→Succeeded in reducing the datacenter's PUE* to nearly 1.2

- Through storage virtualization, The Computer Game Design Department was able to deploy Fujitsu's CELSIUS M370 workstations, which deliver superior graphics performance.

*PUE: Power Usage Effectiveness, the ratio of electricity consumed by a datacenter to the electricity consumed by its ICT equipment. The lower the ratio, the less electricity consumed by anything besides the ICT equipment, making for a more energy-efficient datacenter.
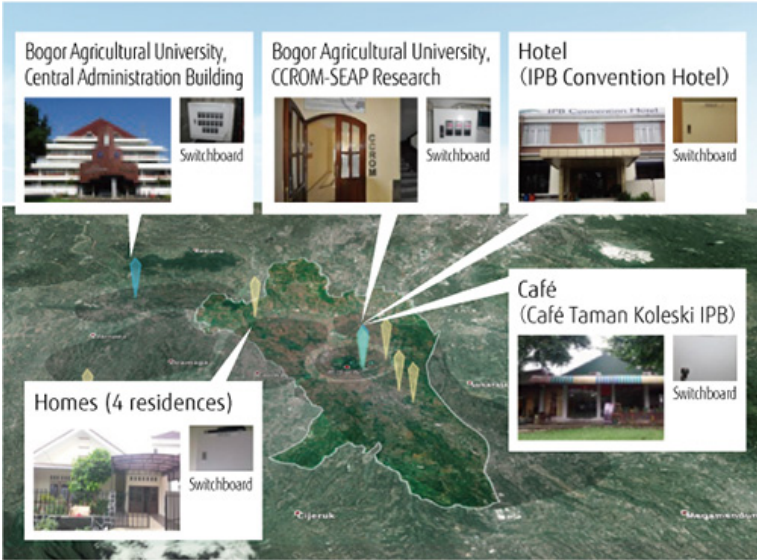
University Campus Suffolk in the UK

Using ICT to Help Customers Reduce Their Greenhouse Gas Emissions

FUJITSU

- **Fujitsu constructed an environmental energy monitoring system to help Indonesia's efforts to become a low-carbon society**

  - Domestic energy demand is forecasted to exceed supply by 2020

  - In order to measure energy consumption over a city wide area, we are monitoring energy consumption at 100 locations inside the city of Bogor, including the university, hotels, cafés, and homes. With a system developed using Fujitsu's Environmental Management Dashboard (see slide 15) as a foundation, data are displayed.

  - Through analyzing variation in peak consumption hours from facility to facility and specifying the sources drawing electricity, **promote energy saving measures as a city whole**.

National Institute for Environmental Studies of Japan

Indonesian universities

Indonesian government agencies

Fujitsu

List of monitoring points inside Bogor city

Bogor Agricultural University, Central Administration Building — Switchboard

Bogor Agricultural University, CCROM-SEAP Research — Switchboard

Hotel (IPB Convention Hotel) — Switchboard

Café (Café Taman Koleski IPB) — Switchboard

Homes (4 residences) — Switchboard

Providing Sustainability Solutions

FUJITSU

- ■ Providing a disaster information sharing system using smartphones for disaster prevention and mitigation in Vietnam and Indonesia

  - ■ In emerging market countries, for disaster countermeasures, there is a high need for solutions that are quickly effective, energy-conserving, low-budget, and simple.

  - ■ We constructed a system that allows citizens who use smartphones to participate to gather and share information on river water levels and rainfall levels.

  - ■ It enables the **sharing of disaster information in real time**, and it has the effect of **cultivating and improving the mindset of citizens with regard to disaster prevention and mitigation.**
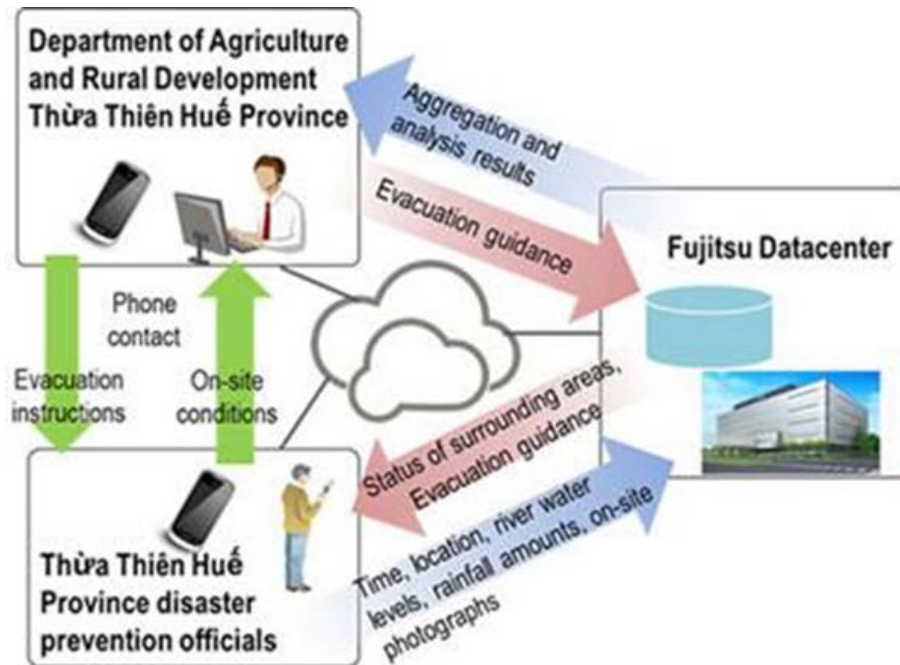
Smartphone application screen

Environmentally Friendly Products (Energy and Resources)

FUJITSU

■ Conserving energy and resources to enhance competitiveness

Improve the energy conservation features of products	X	Actively engage in improving resource efficiency throughout the entire lifecycle
・Optimize circuit/cooling design ・Use components that conserve energy 　～such as a high-efficiency power supply, LSIs that consume less power ・Enhance power-saving features (hardware and software)		・More compact and lightweight ・Use recycled plastic ・Reduce parts counts ・Easy to dismantle ・Easy to recycle ・Easy to maintain and repair

Example **FUJITSU Server GS21 2600**

Energy:
- **Energy consumed per unit of performance reduced by up to 50%**

Resources:
- **Reduced weight by up to 58%**
- Use high-efficiency power supply that received 80 PLUS®* Gold certification
- **Installation space roughly one-third of previous model**

*80 PLUS®: Certification program for the energy efficiency of computer power supplies

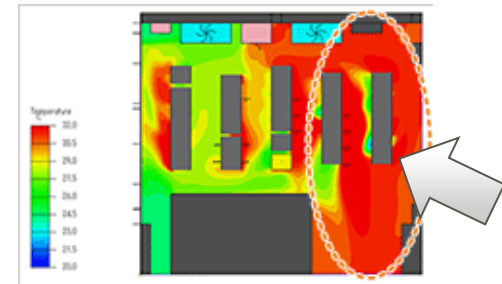# Reduction in Greenhouse Gas Emissions : Datacenters

- **Unified management of power consumption at 74 locations with Environmental Management Dashboard**
  - In datacenters, where power consumption is increasing, we implement energy efficiency improvement measures. (deploying high-efficiency equipment and designing server room layout through temperature distribution simulation)
  - We constructed and deployed PUE* visualization tools on our Environmental Dashboard, which enables the energy consumption status of each datacenter and best practices to be shared.

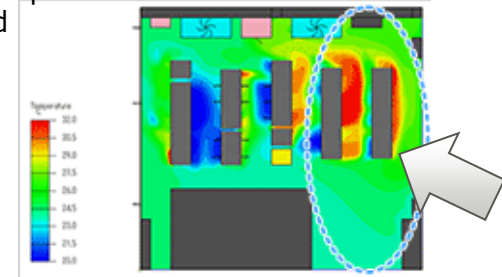Operational status of each datacenter is displayed
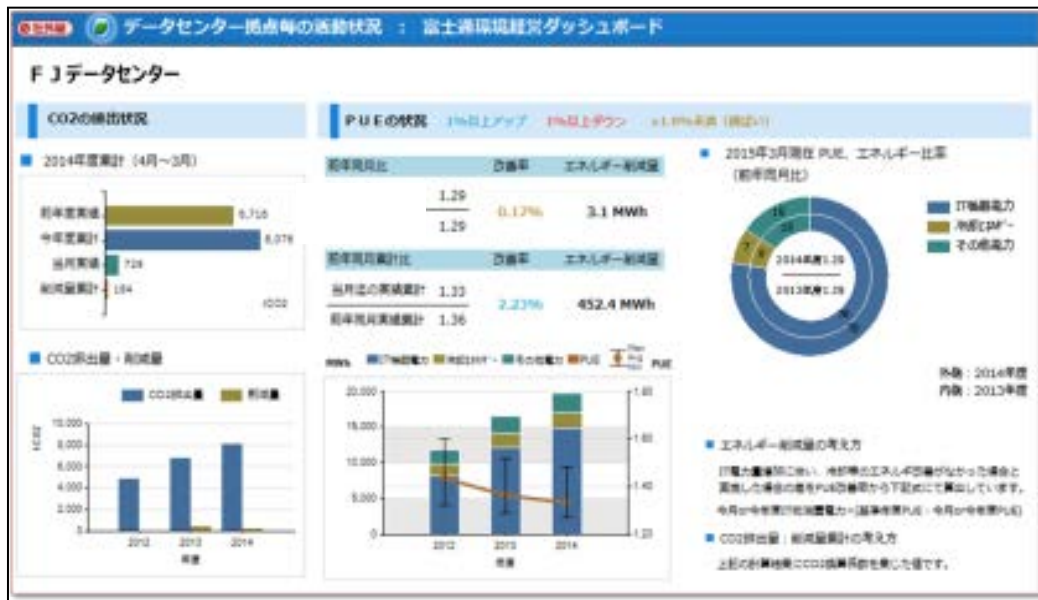
Improving datacenter energy efficiency

Identify hot spots in server rooms

Simulation of temperature distribution in server room after proposed countermeasures are implemented

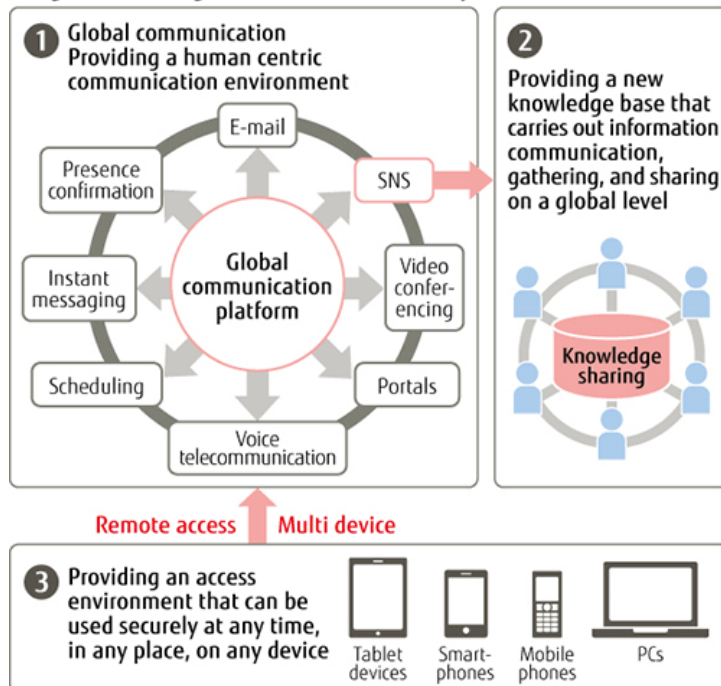*PUE: Power Usage Effectiveness (defined on slide 11)

Reduction in Greenhouse Gas Emissions

FUJITSU

- Use Global Collaboration Platform to transform work-styles and significantly reduce burden on the environment
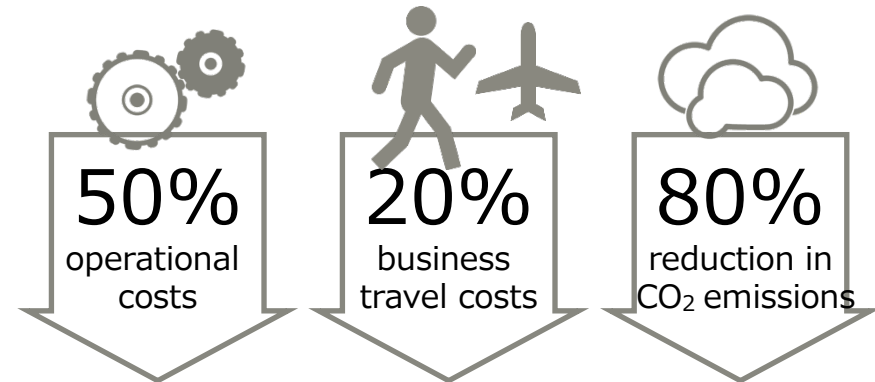 - Through video conferencing, knowledge sharing, and ICT infrastructure, compared to the levels prior to deployment, burden on the environment reduced by the equivalent of roughly 80% of CO_2 emissions volume
  - Internal case studies provided as references to roughly 150 companies/1 million people

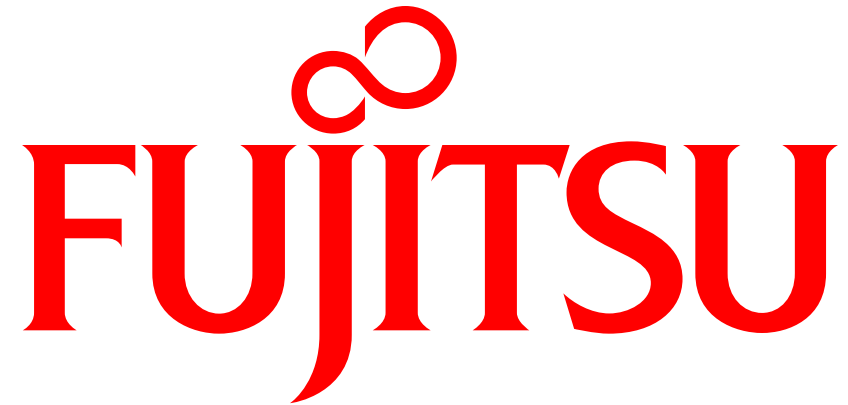

Diagram of the global communication platform

❶ Global communication
Providing a human centric communication environment

- E-mail
- SNS
- Presence confirmation
- Video conferencing
- Instant messaging
- Global communication platform
- Scheduling
- Portals
- Voice telecommunication

❷ Providing a new knowledge base that carries out information communication, gathering, and sharing on a global level

Knowledge sharing

Remote access   Multi device

❸ Providing an access environment that can be used securely at any time, in any place, on any device
- Tablet devices
- Smart-phones
- Mobile phones
- PCs

Impact of deployment
(internal calculations)

50% operational costs

20% business travel costs

80% reduction in CO_2 emissions

Fujitsu Group Initiatives

FUJITSU

- Generate Human Centric Innovation through ICT, contribute to resolving the earth's environmental problems
- Use ICT to reduce Fujitsu's own burden on the environment
- Provide internal case studies as references for customers

Sustainability

- Energy and climate change
- Depletion of resources
- Scarcity of food and water
- Loss of biodiversity

Innovation
People's activities, business, society

Crisis of sustainability

Take on the challenge with ICT

Year

Cautionary Statement

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- Macro-economic environments and market trends in the principle geographic markets for Fujitsu's services and products, which are Japan, EMEIA, the Americas, Asia, Oceania and elsewhere, particularly such conditions that may effect customers' IT spending;
- Rapid technological change, fluctuations in customer demand and intensifying price competition in IT, telecommunications, and electronic device markets in which Fujitsu competes;
- Fujitsu's ability to dispose of non-core businesses and related assets through strategic alliances and sales on commercially reasonable terms, and the impact of losses which may result from such transactions;
- Uncertainties as to Fujitsu's access to, or protection for, certain intellectual property rights;
- Uncertainty as to the performance of Fujitsu's strategic business partners;
- Declines in the market prices of Japanese and foreign equity securities held by Fujitsu which could cause Fujitsu to recognize significant losses in the value of its holdings and require Fujitsu to make significant additional contributions to its pension funds in order to make up shortfalls in minimum reserve requirements resulting from such declines;
- Poor operating results, inability to obtain financing on commercially reasonable terms, insolvency or bankruptcy of Fujitsu's customers, or any such factor that could adversely impact or preclude these customers' ability to timely pay accounts receivables owed to Fujitsu; and
- Fluctuations in rates of exchange for the yen and other currencies in which Fujitsu makes significant sales and profits or in which Fujitsu's assets and liabilities are denominated, particularly between the yen and Euro, British pound and U.S. dollar.