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.
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
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

Fujitsu Supports the COP21 Agreement

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.
- Japanese companies: Fujitsu, Ricoh, Toshiba, Kokusai Kogyo, Takeda Pharmaceuticals, Teijin, Sony Mobile
- Japanese local governments: Gifu, Tokyo, Yokohama

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**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.”

[http://www.parispledgeforaction.org/read/](http://www.parispledgeforaction.org/read/)
FUJITSU GROUP’S ENVIRONMENTAL MANAGEMENT
Fujitsu’s Vision of the Future

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.

CO₂ emission levels of ICT and the effect of CO₂ emission reductions by using ICT (Gt-CO₂e)

<table>
<thead>
<tr>
<th>Year</th>
<th>CO₂ Emission of ICT</th>
<th>CO₂ Emission by ICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>1.27</td>
<td>9.10</td>
</tr>
<tr>
<td>2030</td>
<td>1.25</td>
<td>12.08</td>
</tr>
</tbody>
</table>

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 contributions to the environment through leveraging ICT (by ICT)
- Reductions in the environmental burden due to Fujitsu Group’s own business activities
Results of the Environmental Action Plan Stage VII

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

*Target revised upward at the end of fiscal 2014.
## Results of the Environmental Action Plan Stage VII

<table>
<thead>
<tr>
<th>Target items (by the end of FY 2015)</th>
<th>Results from FY2013</th>
<th>Results from FY2014</th>
<th>Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Reduce greenhouse gas emissions in our business facilities by over 20% compared to 1990.</td>
<td>Reduced by 29.4%</td>
<td>Reduced by 33.1%</td>
<td>✓</td>
</tr>
<tr>
<td>✓ Improve energy intensity in our business facilities over 1% each year.</td>
<td>1.6%</td>
<td>5.1%</td>
<td>✓</td>
</tr>
<tr>
<td>✓ Improve environmental performance of our major data centers.</td>
<td>Established the Green Datacenter Committee. Set internal targets.</td>
<td>Formulated Guidelines for Promoting Environmentally Conscious Datacenters. Adopted PUE visualization tools</td>
<td>✓</td>
</tr>
<tr>
<td>✓ Reduce CO₂ emissions per sale from transport over 1% (on average) compared to FY2013.*</td>
<td>Reduced by 32% (*result under the previous goal)</td>
<td>Reduced by 13%</td>
<td>✓</td>
</tr>
<tr>
<td>✓ Expand activities of reducing CO₂ emissions to all types of suppliers.</td>
<td>Reached 95.9% of business partners implementing CO₂ reduction/limitation measures.</td>
<td>Reached 100% of business partners implementing CO₂ reduction/limitation measures.</td>
<td>✓</td>
</tr>
<tr>
<td>✓ Increase generation capacity and procurement of renewable energy.</td>
<td>Installed 210 kW of new solar power generation facilities. Purchased approx. 23,000 kWh of green power.</td>
<td>Concluded an agreement to purchase solar generated electricity in the U.K. Purchased approx. 21,000 kWh of green power.</td>
<td>✓</td>
</tr>
<tr>
<td>✓ Continue efforts for efficient use of water, e.g. water recycling and water saving.</td>
<td>Water usage: 18,620,000 m³ (reduced by 6.3% compared to FY 2012)</td>
<td>Water usage: 16,600,000 m³ (reduced by 10.8% compared to FY 2013)</td>
<td>✓</td>
</tr>
</tbody>
</table>

### 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 | ✓ |
| ✓ Keep Zero Emission in factories in Japan. | | | |
| ✓ 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.
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.
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.
Providing Sustainability Solutions

- 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.
Conserving energy and resources to enhance competitiveness

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

**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

*PUE: Power Usage Effectiveness (defined on slide 11)
Reduction in Greenhouse Gas Emissions

- 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 CO₂ emissions volume
  - Internal case studies provided as references to roughly 150 companies/1 million people

Impact of deployment (internal calculations)

- 50% operational costs
- 20% business travel costs
- 80% reduction in CO₂ emissions
Fujitsu Group Initiatives

- 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

- 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
shaping tomorrow with you
Cautionary Statement

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- 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.