

気候変動における緩和と適応へのチャレンジ

Challenge to Mitigation and Adaptation for Climate Change

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堀ノ内 力

Tsuyoshi Horinouchi

品質推進本部長代理兼環境推進部長

Assistant General Manager, Total Quality Management Division

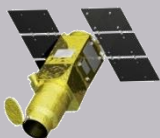
Department Manager, Environmental Management Promotion Dept.

NECの事業領域と主な商品・サービス (Products and Services)

Public Business



safety



Satellite Systems



Digital TV

Enterprise Business



Distribution system



Office Solutions

Telecom Carrier Business



LTE Network Systems



Submarine Cable system



Microwave NW systems

Smart Energy Business



Energy Management



Fast charger for EV



Li-ion Batteries

共通ソリューション (Platform Solutions)

クラウド基盤

NEC Cloud IaaS
NEC Cloud System

SDNソリューション

NEC SDN Solutions

ビッグデータ

NEC Big Data Solutions

Platform Products

Server



サーバ



IT・NW統合ソリューション

PC Tablet



ビジネスPC/タブレット

Display



ディスプレイ

人にやさしい Friendly to humans

いつでもどこでも誰もが使えるサービスによって
安心・安全・便利で豊かな個人生活を実現する情報社会

To create a society where all human beings
can enjoy the benefit of “safety, security,
comfort, and convenience”



地球にやさしい Friendly to the earth

限りある資源を効率的に活用し
地球環境と共存・持続的な発展を可能とする情報社会

To contribute to solving the problems
we face in our earth environment and
“reduce impact on the environment”

The Earth in 2050

Energy demand

1.8 times

Greenhouse gas

1.5 times

Demand for food

1.7 times

Demand for water

1.6 times

Urban population

6.3 billion people

(currently 3.5 billion people)

1.8 times

Society in 2050 will require double the earth's available resources

成長に向け取り組む領域 (The domains where work for growth)

メガトレンドから導き出した社会課題に対し、NECが貢献できる領域を、**7つの社会価値創造テーマ**として設定

NEC formulates **“Seven Themes for Social Value Creation”** in line with global megatrends.



ICTによる社会課題解決 (Social Value)

Orchestrating a brighter world **NEC**

NEC Vision for Social Value 2015-2016

Forest Protection Monitoring predicting the Spread of Fires



Orchestrating a brighter world
Sustainable Earth

Coexistence with the Earth

In the next 30 years, the increase of the world's population and urbanization will bring threats with such as large burdens on the global environment and an increase of natural disasters. NEC recognizes that the state of the world will continually change, and we are committed to contribute to the realization of a society coexisting with

Social value creation

Customer and Society issues

- Reduction of greenhouse gas emissions
- Preparation for disasters due to climate changes
- Sustainable utilization of resources

Create customer value

- Grasping and predicting environments through monitoring
- Predicting and forecasting the occurrence of disasters with data analysis
- Predicting demands for resources and optimally adjusting supply

Create social value with customer

- Effective and efficient measures to prevent global warming
- Upfront prevention of disasters and appropriate evacuation guidance
- Reduction of waste and stable supply of resources

For Value innovation

- Collaboration
- IT services
- Core ICT assets

<http://www.nec.com/en/global/about/vision/book/index.html>

環境活動

Environmental Activities

NEC Environmental Management Action Plan 2017/2030

Targets:

1. 低炭素 (Low Carbon) : ITソリューションで社会のCO2削減寄与

Reduction in CO2 emissions of customers and society through NEC's IT solutions

Help reducing CO2 emissions by 15 million tons in 2017*, and 50 million tons in 2030*.

2. 低炭素 (Low Carbon) : 製品エネルギー効率向上

Energy efficiency improvement of NEC products to reduce CO2 emissions at the product usage stage

80% reduction in power consumption of all products in 2017, compared with 2005, and a further 10% reduction by 2030.

3. 生態系生物多様性 (Ecosystem and Biodiversity Preservation)

4. 資源循環・省資源 (Resource Recycling and Conservation)

2017* starts 1st April 2017 and ends 31st March 2018.

2030* starts 1st April 2030 and ends 31st March 2031.

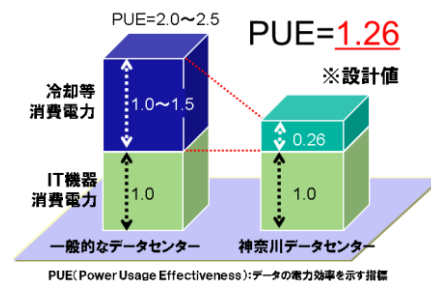
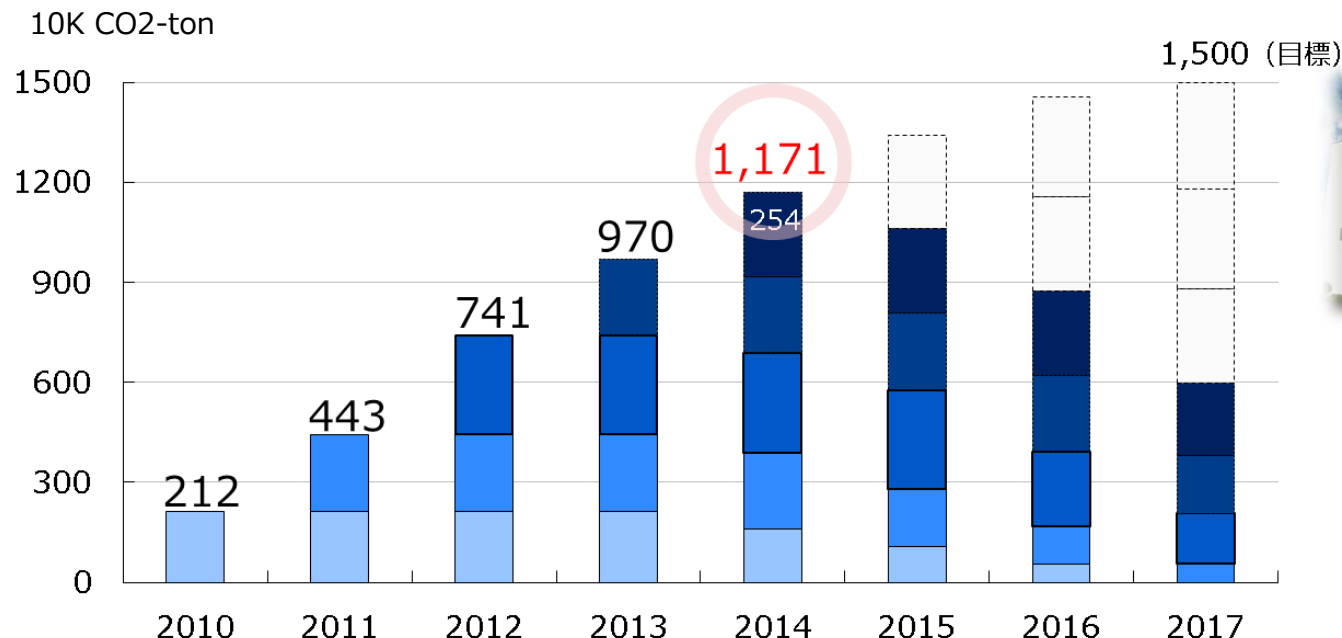
1. 低炭素 ; ITソリューションの提供を通じた社会全体のCO2削減

1. Low carbon: Contribution to CO₂ emission reduction globally through NEC IT solutions

Target in FY2017 : 1,500万t (15Million CO2-ton /accumulated)

Results in FY2014 : 1,171万t (1.17Million CO2-ton/accumulated)

e.g.) データセンター省エネ、交通システム効率化、ネットワーク効率化など
By introducing energy reduction of Data Center Facilities, Effective Traffic systems, and effective Network systems



2.製品のエネルギー効率の改善



2.Low carbon: Improvement of product energy efficiency

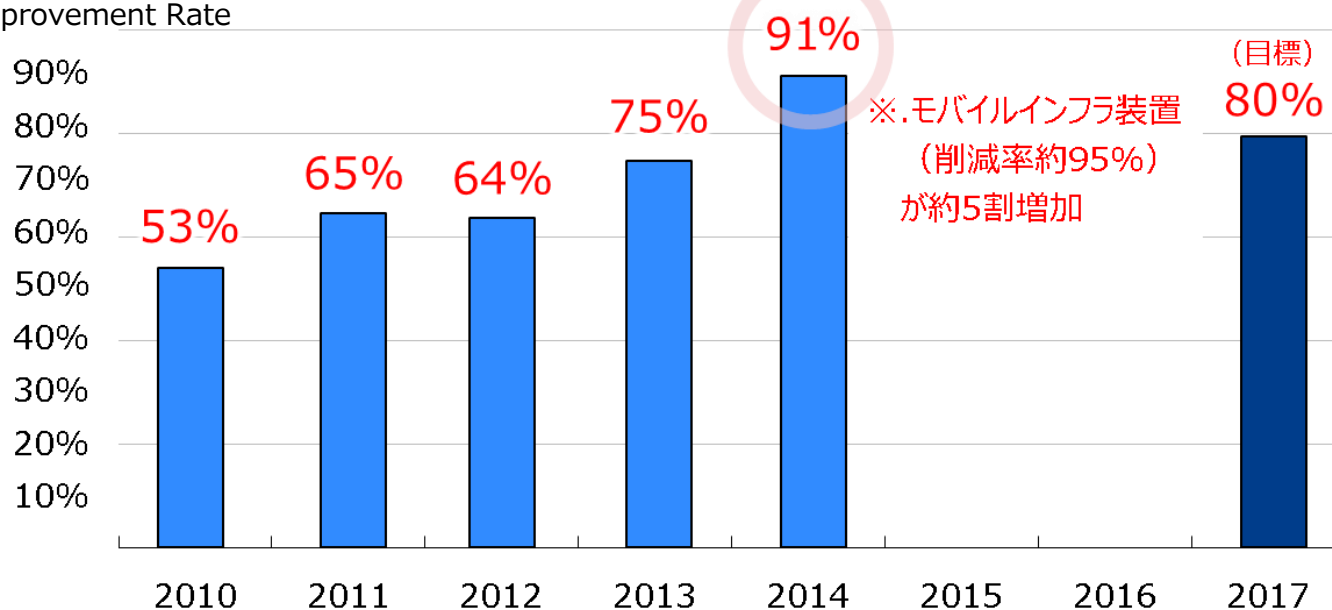
Target in FY2017 : 80% improvement (compared with 2005-model) ※

Result in FY2014 : 91%

例) サーバー、通信機、ディスプレイなど
e.g.) Server, Network system, Display

※ 当該年度出荷製品の性能を出すために必要な消費電力について、2005年度モデルと当該年度モデルとの年間エネルギー使用量を比較した場合の削減割合

Improvement Rate



相変化冷却ユニット

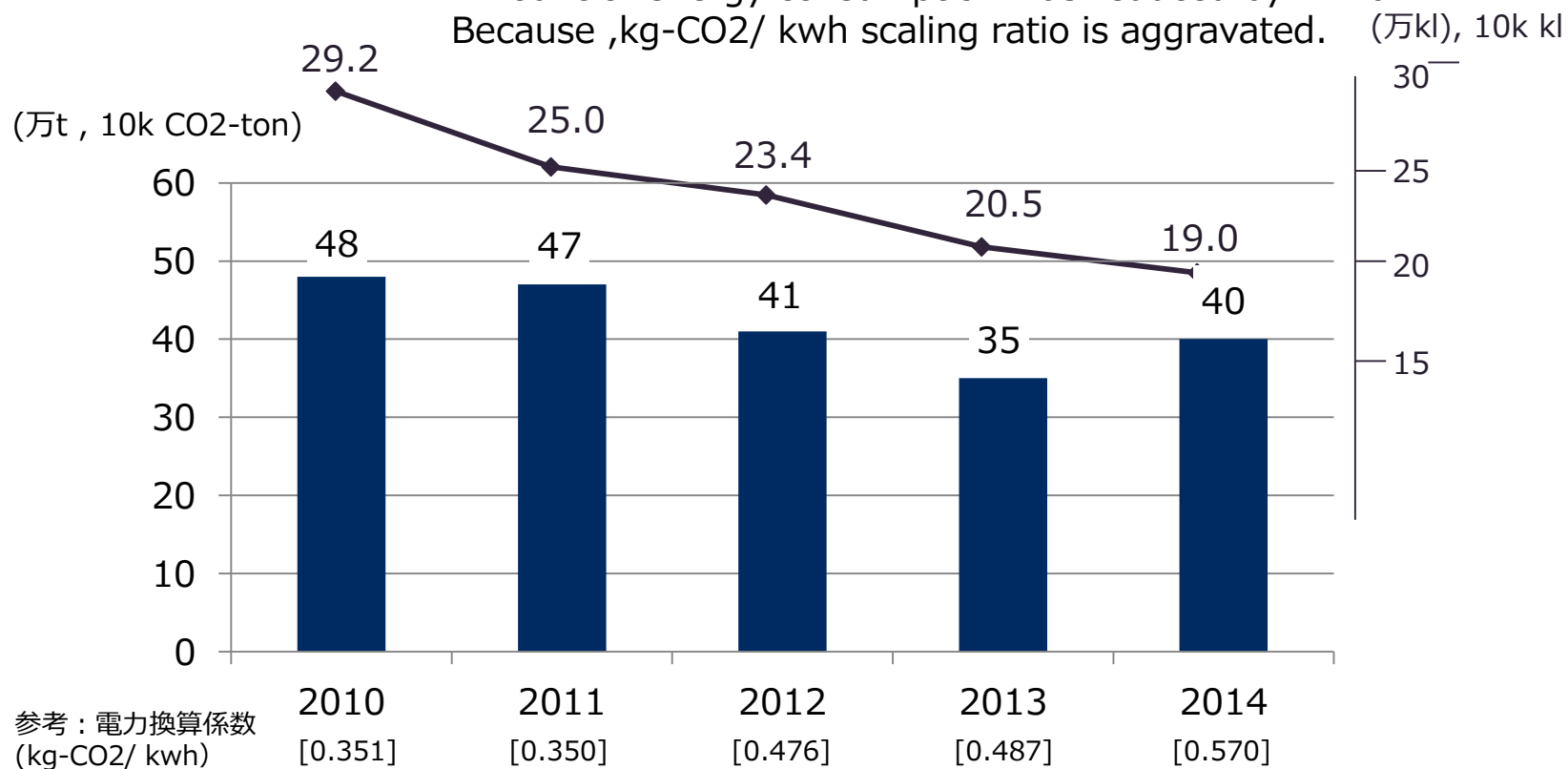


NECグループのCO2排出量削減

CO₂ Emissions Reduction in NEC group

- Target by FY2030 ; 30% reduction (compared with FY2013)
- Result by FY2014 ; 40万t 0.4Mton-CO₂ (前年比11%増; 11% increased)

※ エネルギー使用量〔原油換算kl〕は、7.1%削減
Amount of energy consumption was reduced by 7.1%.
Because ,kg-CO₂/ kwh scaling ratio is aggravated.



COP21-IPCCAR5を踏まえたチャレンジ

Challenges based on COP21 – IPCC AR5

気候変動の8つのリスク (8-Key Risks in Climate Change)

Extracted from IPCCAR5WG II



① 海面上昇、沿岸での高潮被害などによるリスク

Damage caused by rising sea levels and storm surge in coastal areas



② 大都市部への洪水による被害のリスク

Damage caused by flooding in urban areas



③ 極端な気象現象によるインフラ等の機能停止のリスク

Breakdown of infrastructure and other societal functions due to extreme weather events



④ 熱波による、特に都市部の脆弱な層における死亡や疾病のリスク

Death and ill health caused by heat waves which particularly affect vulnerable groups in urban areas



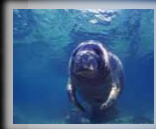
⑤ 気温上昇、干ばつ等による食料安全保障が脅かされるリスク

Threat to food security caused by rising temperatures and drought



⑥ 水資源不足と農業生産減少による農村部の生計及び所得損失のリスク

Loss of livelihood and income in rural areas due to insufficient water resources and reduced agricultural productivity



⑦ 沿岸海域における生計に重要な海洋生態系の損失リスク

Loss of marine ecosystems that are vital to coastal water areas



⑧ 陸域及び内水生態系がもたらすサービスの損失リスク

Loss of services provided by terrestrial and inland water ecosystems

危機対応

資源維持・効率化

Challenges based on COP21 & IPCCAR5

1. 事業を通じた気候変動対策への取組み促進

Promoting “climate change measure” through business

- ICTによる途上国GHG削減支援（緩和）

Contribution of GHG emission reduction by NEC’s ICT. (mitigation)

- 温暖化で被害拡大が予測される途上国に対し、防災や水、農業事業を通じた貢献促進（適応）

Contribution to prepare for the damage caused by natural disasters predicted by global warming by NEC’s ICT.(adaptation)

2. 自社及びサプライチェーンのGHG排出削減活動

Reducing GHG emission of NEC Group and Supply-chain

- スマートビル化 (Challenge to develop Smart energy building)
- Scope3

3. 気候変動問題に対する市場の理解促進

Raising market awareness of “climate change problem”

- 気候変動パンフレットの作成と公開

Published climate change brochure.

1.事業を通じた気候変動対策への取り組み促進

Promoting "climate change measure" through business

「緩和」へ最大限取り組むとともに、社会ソリューション事業を通じて「適応」に寄与する

Maximum focus on "mitigation" plus strong effort to contribute to "adaptation" through social solution business.



- ① **「緩和」**：産業革命前からの気温上昇を2℃（1.5℃）以内に抑える
「Mitigation」； Contribute to achieve less than +2℃(1.5℃) target



Innovation for Energy saving technologies

- ② **「適応」**：8つのリスクへの備える
「Adaptation」； Prepare for 8 risks



More suitable "Social solutions" for risk area

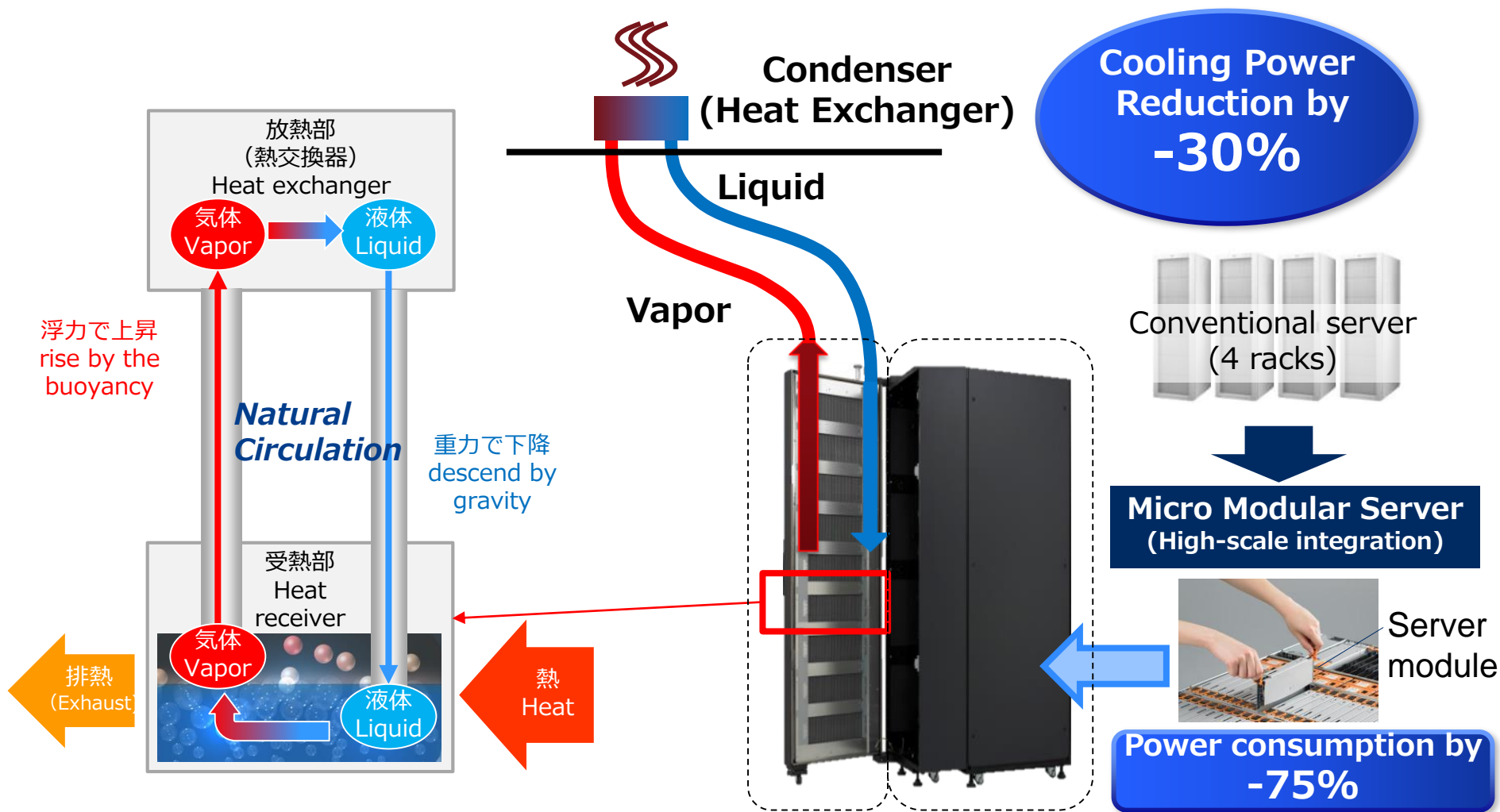
データセンター省エネ技術

Energy saving technologies for Data Center

緩和
Mitigation

相変化冷却ユニット (Phase Change Cooling Unit)

ICT equipment heat reduction by phase change(vapor ⇔ Liquid).



太陽光発電・蓄電・地下冷気活用による電力利用の効率化

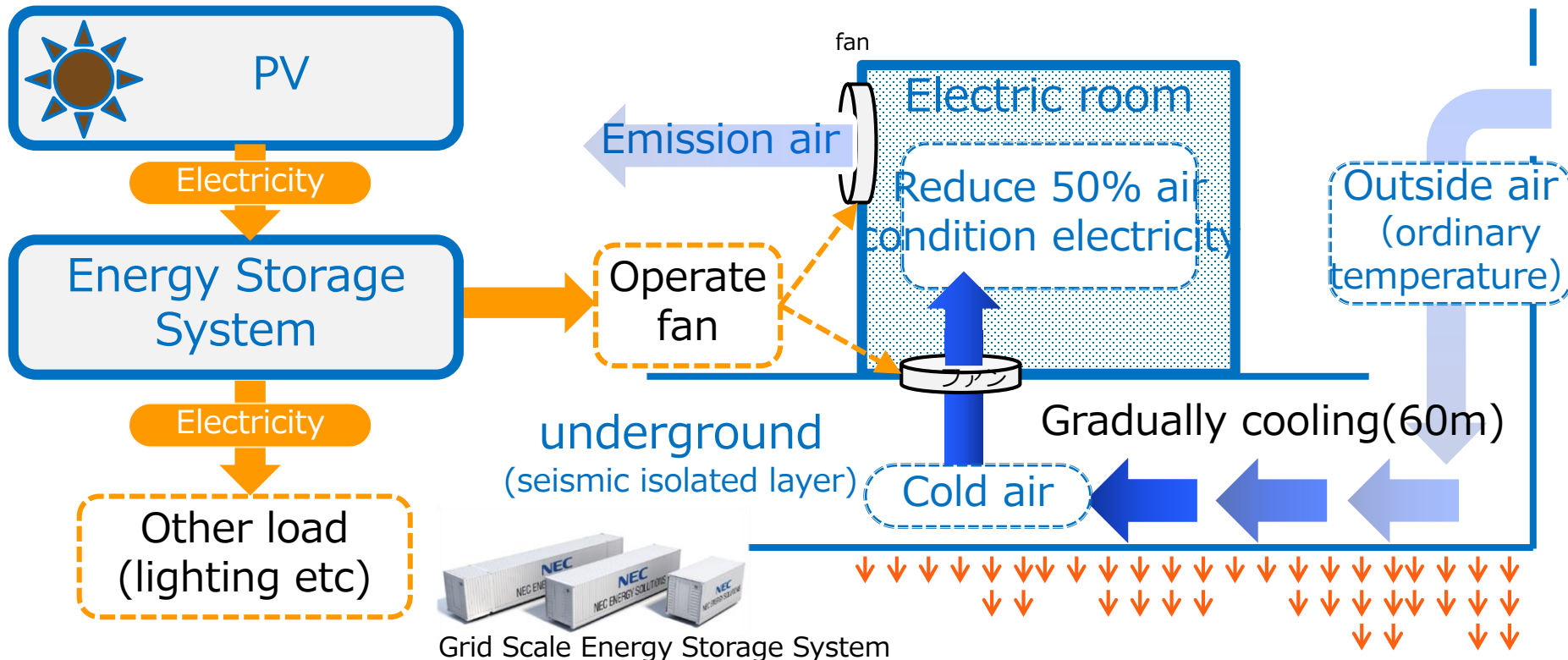
(Efficient power usage: PV, ESS and underground cold air)

太陽光発電、地下冷気活用により電気室の**空調消費電力を50%削減**

Using PV and underground cold air, **reduce 50% of air conditions electricity** of Electric room.

PV / ESS

地下冷気活用 Underground cold air



データセンター電力利用の効率化 (Efficient power usage of Data Center)

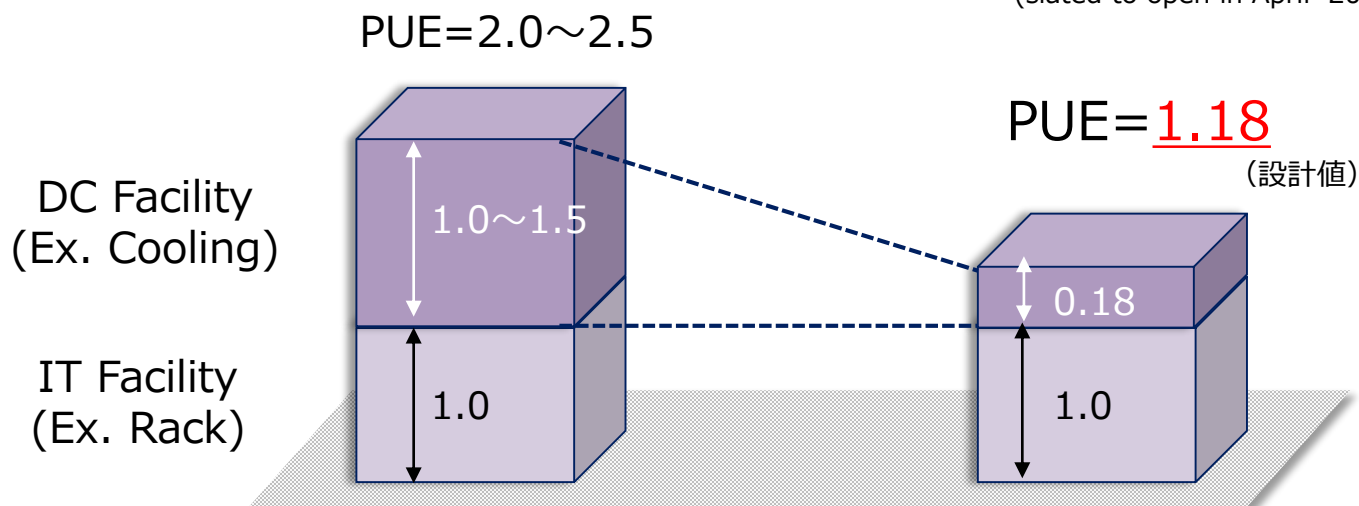
PUE = 2.0の場合と比べ、電力使用量を41%削減

Electric power consumption is reduced 41 % compared with a case of PUE=2.0.

一般的なデータセンター
General Data Center

NEC神戸データセンター
NEC Kobe Data Center

(slated to open in April 2016)



※PUE (Power Usage Effectiveness) : データセンターの電力効率を示す指標
= DC消費電力(Power consumption of DC) / DC内IT機器消費電力
Data center energy efficiency calculated by dividing total power consumption by IT equipment power consumption.
The lowest and best possible value is 1.0.

風水害に対する防災ソリューションの提供

Disaster Prevention Solution

適応
Adaptation

Climate change
気候変動

Society / Economy
社会・経済

- 集中豪雨
Local heavy rain
- 超大型台風/
爆弾低気圧
Large Typhoon
- 極地の氷の
融解
Fusion of polar ice

- 都市化
Urbanization
- 森林伐採による
森の保水力低下
Water holding
ability decline in a
forest by forest
felling

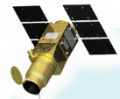
- ✓ 洪水・
土砂災害
Flood
/Land slide
- ✓ 竜巻等の
突風
Gust
e.g. tornado
- ✓ 高潮
storm surge

災害対応プロセス Necessary Flow

- リスク管理
Risk Management
- 災害予測
Prediction
- 予防対策
Preventive action
- 避難誘導
Lead of refuge
- 被災状況把握
Grasp damages
- 救助・救援
Rescue
- 復興
revival

ソリューション

- リスクアセスメント
Risk assessment
- 潮位モニタリング
Sea level monitoring
- 土砂災害/
洪水氾濫予測
Simulation Landslide/Flood
- 水門監視制御
Floodgate monitoring
- 早期警報システム
Early warning system
- 災害ビッグデータ解析
Big Data analysis
- 携帯型赤外線センサ
Handy Infrared Ray sensor



[平時]
減災対策
支援

[発生前]
迅速・正確な
避難誘導
支援



[発生後]
要救助者の
早期発見・
効果支援

防災NW基盤

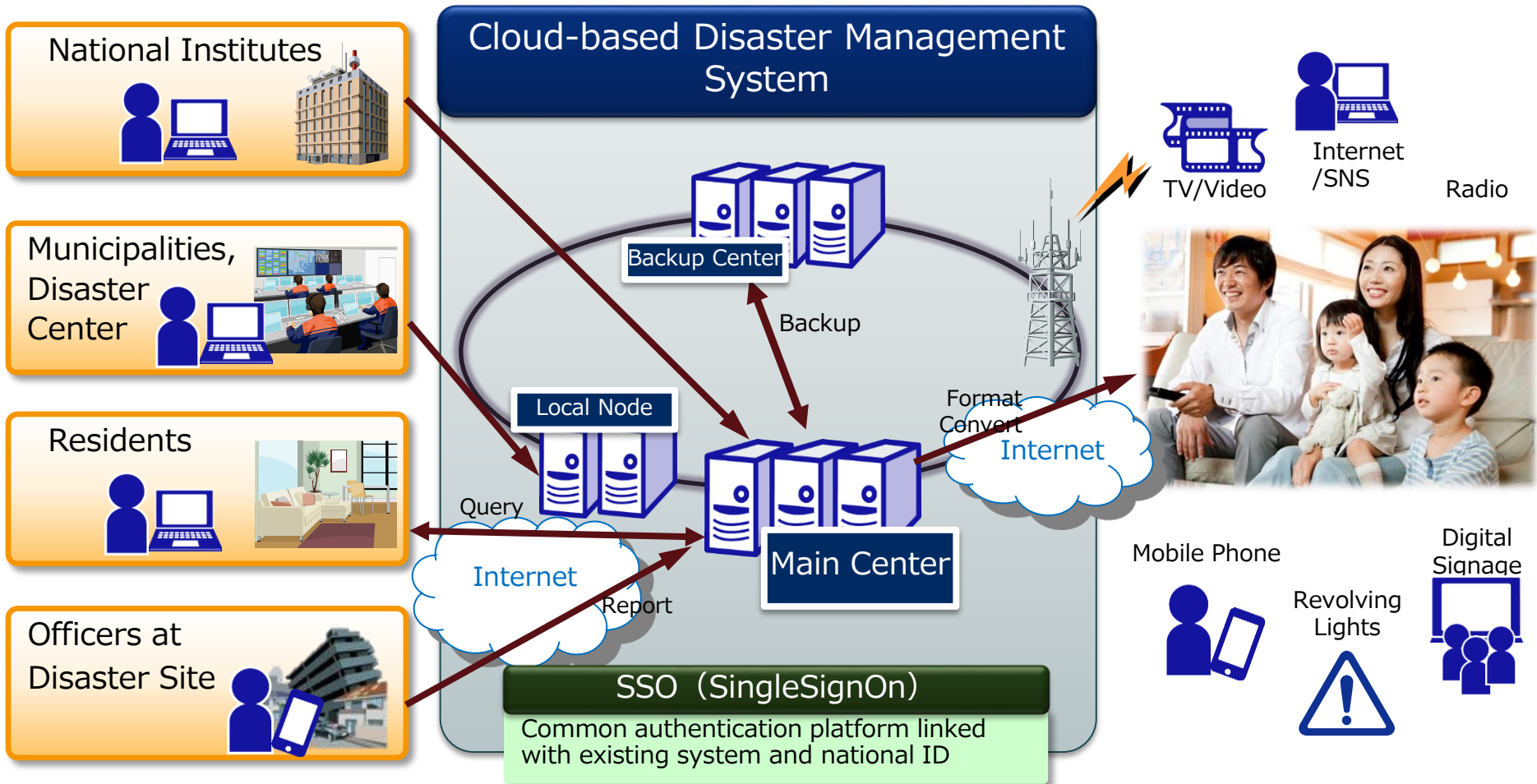
Satellite
Communication system



防災マネジメントシステム

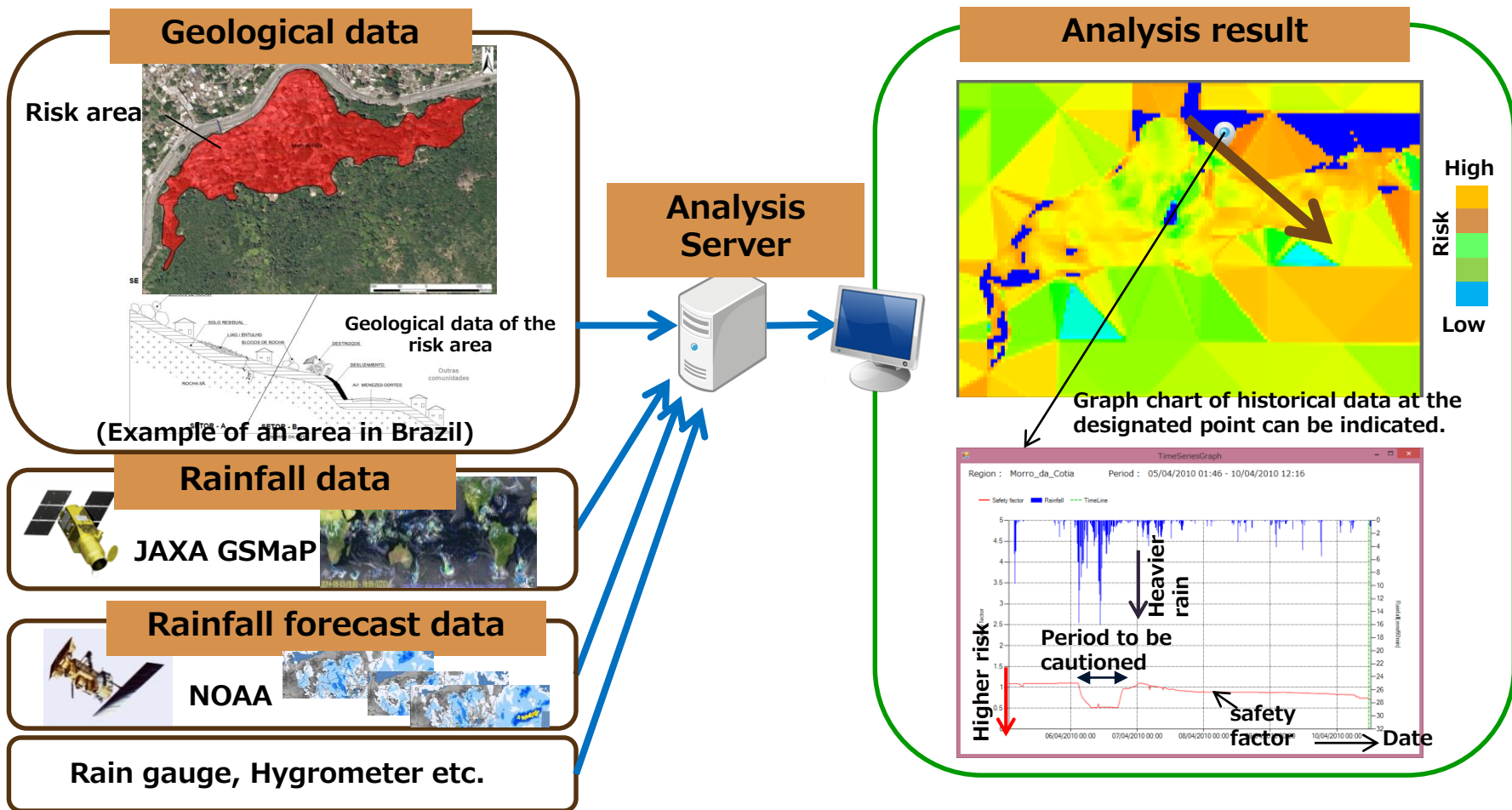
Cloud-based Disaster Management System

Cloud-based Disaster Management System accelerates decision-making & countermeasure-taking plus information sharing depending on needs of residents..



土砂災害予測システム (Landslide Simulation System)

- The system analyzes and displays safety factor of the designated risk area by using geological data and rainfall data as a risk indicator of a land slide disaster.
- またNECは、**土砂災害検知・予測システム**を開発中。地滑り発生前の10~40分前の検知に成功。Moreover, NEC is developing **Landslide detection & prediction system**. Succeeded in the prediction 10-40 minutes before landslide occurrence. (by moisture content in the ground)



2.NECグループのGHG排出削減

Reducing GHG emission of NEC Group and Supply-chain

NEC玉川事業場におけるエネルギー統合管理（9号館スマートビル化）

Challenge to develop “Smart Building “with Integrated energy management

Target FY2015 :**50%** energy use reduction compared with FY2013

Results in Jan, 2016 : **46%**

【FY2013（Phase I）】

- **人検知センサー**による空調・照明の制御導入
Control air conditioning and lighting by “automatic human detection sensor”
- **エネルギー需要予測**（クラウド型BEMSの開発）
Prediction of energy demand (Cloud BEMS)

【FY2014（PhaseII）】

- 太陽光・風力などの**再生可能エネルギー**導入
Introduce **renewable energy** (PV, Wind Power)
- 勤務者がタブレット端末に快適度を入力するシステムを導入（**QoWL※指標**）※Quality of Working Life
Introduce **Energy saving and Comfort compatible system**
- サーバラック**相変化冷却ユニット**の導入
Introduce “**Phase Change Cooling Unit**” in server rack
- **電力指紋分析技術**による機器別消費電力の見える化
Introduce “**electric power fingerprint analysis technology**” and visualize equipment’s power consumption



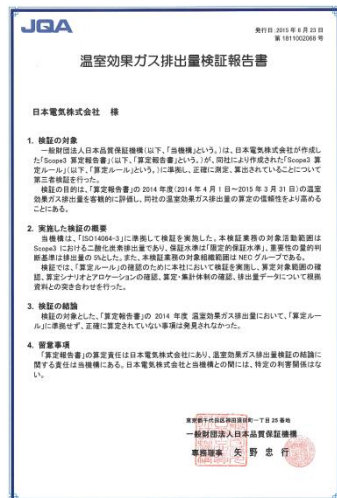
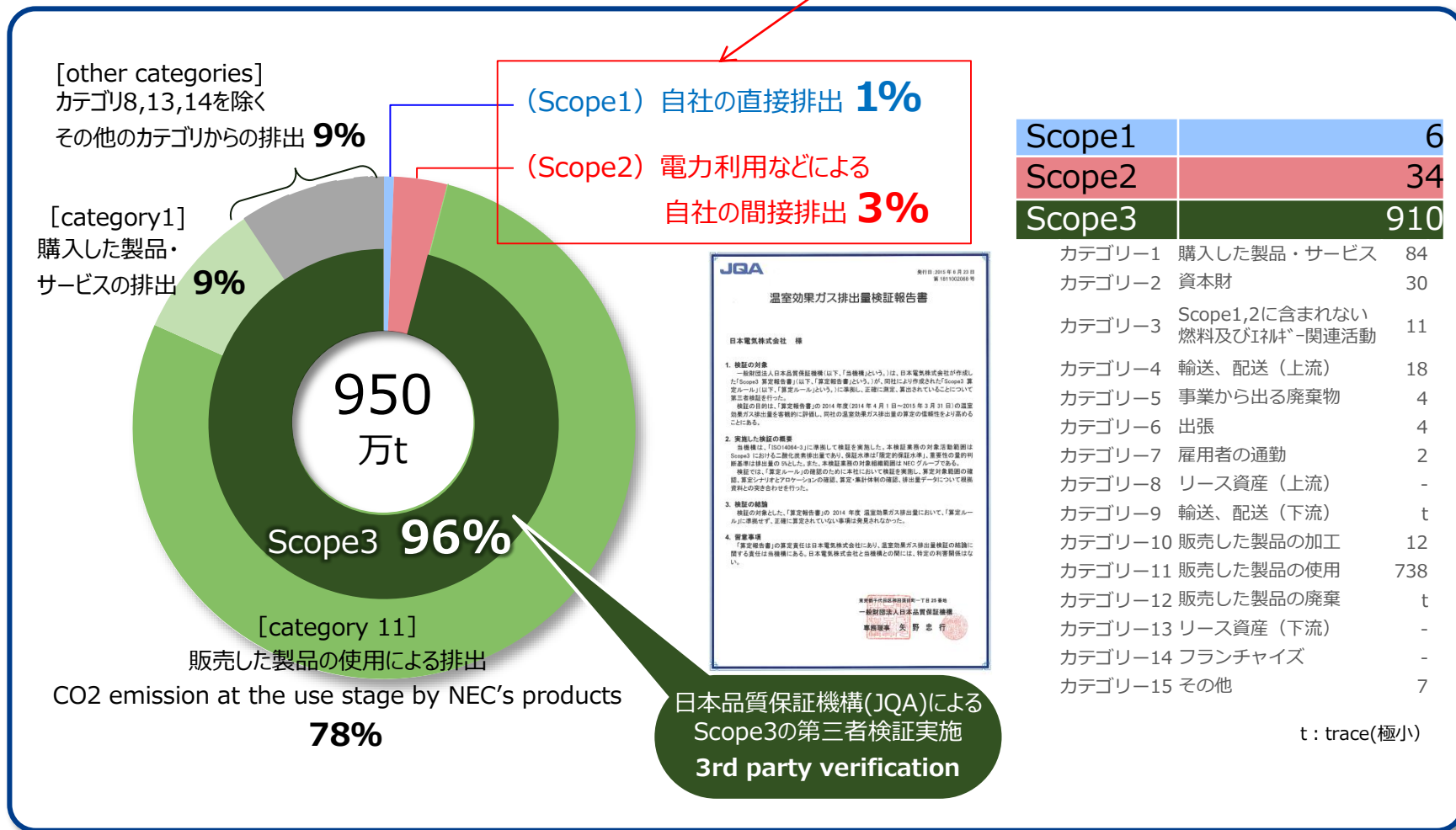
（成果を品川イノベーションワールドで展示中）

サプライチェーンCO2排出量 (Scope1,2,3)

CO2 emission through Supply-chain

FY2014 : 950万t (9.5Mton-CO2)

NEC's own emission



3. 気候変動問題に対する市場の理解促進

Raising market awareness of "climate change problem"

Empowered by Innovation **NEC**

Responses to Climate Change -Supported by ICT

~Preparing for climate change adaptation~



社会への影響

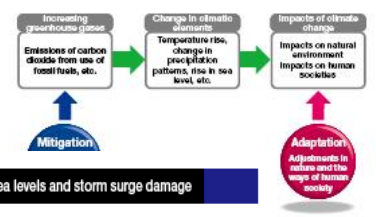
Impact for society

Effort to curb temperature increase to within 2°C of the level before the Industrial Revolution. However, even if GHG emissions were brought to zero today, global warming on the earth would further progress due to the accumulation of GHGs emitted to date, and a range of impacts would appear. Parallel to initiatives to reduce GHG emissions, we must also engage in "adaptation" efforts to prepare for the impacts of climate change.

standard for issuance is "when a danger is predicted". One of the causes of increased and escalating damage in recent years is climate change brought on by global warming. In the midst of these conditions, we must face the risks and work to secure societies and the measures is an

ICTの役割

Roles of ICT



What NEC can contribute to addressing rising sea levels and storm surge damage

NECができること

What NEC can contribute

- with an installation of storm surge barriers
- and prediction prior to storm surge damage
- and prediction prior to storm surge damage
- and prediction prior to storm surge damage

Rising sea levels and storm surge damage

Rising sea levels and risk of storm surge damage along coastlines

A 0.82 m rise in sea level by 2100?

The IPCC 5th Assessment Report envisions a variety of scenarios and predicts the impacts of climate change. Of these, the worst-case scenario predicts sea surface levels to rise by a maximum 0.82 meters. Causes included melting of ice sheets at the South Pole and Greenland, glaciers in the Alps and Himalayas, and the melting of ice sheets in the Arctic region.

A range of observation and monitoring systems required to predict and forecast complex changes in climate.

NEC provides solutions that use a variety of sensors for a diverse range of business areas, from

Simulation on forecast of global annual average air temperature distribution (year 2100). Change in temperature is displayed with the 19th century as a standard (1°C). If temperatures rise, color becomes the red end of the spectrum, with white areas showing increases over 10°C. (photo: ADRIANUS/JAMETEC)

Earth Simulator (photo: JAMETEC)

Illustration of monitoring of forest resources

社外への情報発信 (External Message about Climate Change)

Home > About NEC > Approaches to Environmental Issues

<http://www.nec.com/en/global/eco/index.html>

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Approaches to Environmental Issues

Japanese

Special Contents



Doing Our Part to Address Climate Change at NEC

NEC Group Environmental Management Action Plan 2017/2030

Doing our part to address climate change at NEC

Japanese

Top Message



NEC's climate change measures

Reduction of direct emissions



<http://www.nec.com/en/global/eco/climatechange/index.html>

[CO2 EMISSIONS](#) [Energy Usage Reduction](#) [Shift to Renewable](#)



Orchestrating a brighter world

NEC brings together and integrates technology and expertise to create

the ICT-enabled society of tomorrow.

We collaborate closely with partners and customers around the world,

orchestrating each project to ensure all its parts are fine-tuned to local needs.

Every day, our innovative solutions for society contribute to greater safety, security, efficiency and equality, and enable people to live brighter lives.

 **Orchestrating** a brighter world

NEC