Strategies for reducing CAPEX/OPEX

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* “E” in this material represents that the figure is a plan or projection for operation.
Activities in Progress

Reducing CAPEX: Strategic investment
Strategic investment based on the stage of services

Strategic Investment

life cycle of the service

Efficient Utilization

Rapid Expansion

Aggressive Investment

introduction growth maturity decline

life cycle of the service

Cloud Services/DC/Wi-Fi

FTTH

PSTN

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Changes in capital investment

CAPEX to Sales

19.4% (2009)

15.9% (2014)

Total capital investment

2.2 (Trillions of yen)

1.9

In comparison with FY2005

PSTN

FTTH

3G(FOMA), others

LTE

Cloud Services /DC/Wi-Fi

2005

2014E

* Amounts excludes sales and investments related to real estate and solar power generation operation
<Growing Field: LTE>
Changes in capital investment

Increase LTE base stations
Suppress total capital investment

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Investment of FOMA (Billions of yen)</td>
<td>727</td>
<td>90</td>
<td>7,000 stations</td>
<td>465*</td>
</tr>
<tr>
<td>Total capital investment of NTT docomo</td>
<td>690</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Forecast at the end of FY2013
(New segment reporting structure have been applied from FY2014/1Q)
<Growing Field: LTE>
Improving efficiency of installing base stations

- Reducing goods expenses and improving efficiency of engineering
- Introducing multi-frequency antenna (maximum 5 frequencies) - reduced to 1/3 compared with FOMA*1
- Utilizing the network service of NTT East and NTT West

The unit construction cost of the LTE base stations

Capital investments for LTE

[Bar chart showing decreasing costs from 2011 to 2014E]

Efficient investment

*1 Cost of antenna for one frequency of a base station
*2 Calculated by dividing LTE investment by the number of the installed base station
<Maturing Field: FTTH>
Changes in capital investments

Area coverage rate of FTTH *

Number of FTTH subscribers

Capital investments for FTTH

* Ratio of optical fiber deployment in distribution points (NTT East)
<Maturing Field: FTTH>
Changes in number of opened connections

Over 3 million opened connections

Number of opened connections (millions)

Net increase of subscribers (millions)

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>Number of opened connections</th>
<th>Net increase of subscribers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.65</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>1.75</td>
<td>2.36</td>
</tr>
<tr>
<td></td>
<td>2.36</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>0.74</td>
<td>0.75</td>
</tr>
</tbody>
</table>

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<Maturing Field: FTTH> Reducing the activation costs

- Reduce goods expenses 50% or more
- “DIY” activation rate improved by approx. 20%
- BPR introducing SCM system * including cooperative company

Reduced to 1/2 in delivery time
per one FTTH line compared with FY2003

Reduced to 1/3 in activation cost
per one FTTH line compared with FY2003

* Supply chain management
Applying the fruits of R&D

Significant improvement in work efficiency by “Free-Bending Optical Fiber Cord”

Extend the transmission distance of the optical signal

Previously 7km → Currently 20km or more
To improve the profit margin:

- Reduce activation cost and improve facility utilization rate
- Expand the number of subscribers and its usage

(Billions of yen for Operating Income)

* Summary of “FTTH Access Services” and “Other” from “Designated Telecommunications Services other than Specified Telecommunications Services”
Number of subscribers (millions)

Decreased to half in 10 years

Streamlining the equipments

Asset’s carrying value

Reference year


[ Fiscal year ]
Accelerating activities for streamlining the equipments

Operating profits (left axis)

Profit margin (right axis)

* Calculated from “Voice Transmission Services” and “Leased Circuit Services”
Replacement of legacy equipments
Transport system : 60 thousand racks
Switch system : 1.8 thousand units
Settlement of lines : 400 thousand lines
(from FY2012 to FY2016)

Significant asset reduction

OPEX  ▶ 20 Billion yen/year
(Electricity charges, Maintenance costs, etc.)
Improving efficiency in procurements

**Up to now**

- Cost reduction by introducing new technologies
- Extend the common specification and reduce the variety of goods

**Procurement price** (example: Aerial optical fiber cable)

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price per 1 meter (100 fibers cable)</td>
<td>△70%</td>
<td></td>
</tr>
</tbody>
</table>

**Cost of antenna**

- Reduced to 1/3
  - (Compared to 3G)
  - (Compared to 2G: 1/10)

<table>
<thead>
<tr>
<th>Year</th>
<th>2007 3G (FOMA)</th>
<th>2013 LTE (Xi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of antenna for one frequency of a base station</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Promoting competition by utilizing Dimension Data**

- Suppliers
- Vendors
- RFP
- Operating companies

**From now on**

- Promoting the cooperated procurement strategy for whole NTT group
  - Deployment of visualization and best practices by the unification of IT systems
  - Improve efficiency including the procurement of outsourcing services

The amount of procurements of NTT Group

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td></td>
<td>△20%</td>
</tr>
</tbody>
</table>
Improving efficiency in software development

From optimization of individual companies to optimization in whole group

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**Up to now**

- **Improve efficiency by individual companies**
  - Standardization of development procedure
  - Automation of testing
  - Applying open source softwares
  - Utilizing offshore

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**From now on**

- **Systematization and standardization of procedures and tools by whole NTT group**
  - Applying group common frameworks with open source
  - Applying group common tools (e.g. automated testing, development process control)

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**Assumed effect**

- Cost of new development project
  - 2013
  - 2015

* 20% decrease

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* Templates of Applications
Activities in Progress

Reducing OPEX
Improving efficiency in operation

Significant reduction of operating sites and operators

Trouble reception centers of NTT East and NTT West

Applying IT systems

Further multitasking

Operators in Companies outsourced from NTT East and NTT West

Reference year

2006

2009

2013

[ Fiscal year ]

△10%

△20%

△40%

△40%
Improving efficiency in operation (Example) NTT IR DAY

Applying IT systems

- Monitoring and control system
- Automatic testing system
- Diagnostic and recovery tools

Traffic control and troubleshooting from remote site
Detecting trouble point in fiber network
Trouble diagnosis and recovery by customer
Further multitasking

Cloud & Tablet
- Electronic manuals
- Automated tools (e.g. testing tools)

Multitask by one operator
Suppressing energy consumption by Total Power Revolution (TPR)

- Replacing old equipment to energy efficient type
- Introducing new technologies aggressively
  - Next-generation power transmission system HVDC (High voltage direct current)
  - Cooperative control of the NW equipment, AC and electric supply
  - Outdoor air cooling system

* Predicted by NTT based on the following
“The estimation of the Internet traffic in Japan” (Ministry of Internal Affairs and Communications)
Activities from now
Further reduction of CAPEX/OPEX
Increase of Internet Traffic

Internet traffic of Japan

* Predicted by NTT based on the following
  “The estimation of the Internet traffic in Japan” (Ministry of Internal Affairs and Communications)
  “The present conditions of the mobile communication traffic in Japan” (Ministry of Internal Affairs and Communications)
  Cisco Visual Networking Index
Increase of cyber attacks

Cyber attacks against social infrastructure

Internet of Things

Connected Devices

1.8 Billion

2010

12.5 Billion

2020

Connected Device/Person

6.6

Increase of risk by connecting vulnerable devices

10x increase

Smart city
(social infrastructure interconnectivity)

2012 London Olympics
210 million times of cyber attacks

2012 Japan
A concentrated attack for government websites by crackers

* Source: Cisco IBSG, April 2011
Further evolution of network services

Promoting collaboration model

Accelerate the evolution of networks and operations by maximizing Cloud and Virtualization

Specifically...

- Strengthen the competitiveness by further cost reduction
- Enhance the function to support the creation of the service
- Building the resilient network (Corresponding with increase of traffic and cyber attacks)
Network as of 2020

1) Control by software (e.g. SDN)

Further reduction of CAPEX/OPEX
While traffic will increase by ten times

2) Large capacity, simplified
Cost reduction using EMS *

3) Efficient expansion of wireless access network

- Optical fiber base + new technologies (e.g. WDM)
- LTE, 5G
- Public Wi-Fi
- In-house Wi-Fi

* Electronics manufacturing service

Strengthening the competitiveness by Cloud and Virtualization

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Technology strategies for strengthening the competitiveness

On demand control

Controlling resources quickly and automatically depending on the situation

Realization of TAF (Trusted and Adaptive Fabric)

* The network which has both confidence and flexibility (= tough) to meet various demands of partners, quickly and precisely
Evolution of operations

Correcting and analyzing vast information using AI technologies

Equipment log

Social log (e.g. SNS)

Big Data analysis

Detect the sign of a cyber attacks, traffic fluctuations, equipment failures, etc. and correspond in advance, automatically

Further reduction of OPEX by Proactive Operation
Advanced security management

Global Broadband Network + Seamless security monitoring system + World leading detecting and analyzing technique

Guarding solidly with collective strength

security operation center (including locations with security specialists)
Summary

Increase of traffic and security risk

Need to enhance network

Streamlining capital investment & Cost reduction

Contradiction

R&D + Technical Capabilities

NTT continues to be selected by customer by strengthening the competitiveness of network services