Carrier Network Business
Growth Strategy

July 8, 2010
Carrier Network Business Unit
Executive Vice President and Member of the Board
Junji Yasui
To be a leading global company leveraging the power of innovation to realize an information society friendly to humans and the earth

NEC Group Vision 2017
1. Business overview
2. Mid-term business environment
3. Key business strategy
4. Measures to enhance global competitiveness
5. Toward achieving V2012
Business Domain

Provide products/systems/services as a business partner and support the transformation of carrier services.

Transport

Submarine Cable system

Land Terminal Equipment

PASOLINK

Access

Wireless (3G, LTE), Femtocell, WiMAX

PASOLINK

Wireless Base station

Mobile backhaul

Services & Management

OSS/BSS

NetCracker

Carriers/ISPs' Datacenter

Service Platform

SDP

Home

FTTH, ADSL etc

Enterprise

Mobile core SIP Server IMS

Core Network

Router/ Switch

PASOLINK

Mobile core SIP Server IMS

Core Network

Router/ Switch

NetCracker

Carriers/ISPs' Datacenter

Service Platform

SDP

Home

FTTH, ADSL etc

Enterprise
Business Organization

Segment

IT Services
Platform
Carrier Network
Social Infrastructure
Personal Solutions
Others

International Sales and Operations Business Unit

Sales in FY2009
627.4 billion yen

Organi zation

IT Services Business Unit
Platform Business Unit
Carrier Network Business Unit
Social Infrastructure Solution Business Unit
Personal Solutions Business Unit
NEC Energy Devices
NEC TOKIN
Others
Sales and Operating Profit of Carrier Network Business

(Billions of Yen)

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (Overseas)</th>
<th>Operating Profit (Overseas)</th>
<th>Sales (Japan)</th>
<th>Operating Profit (Japan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2008</td>
<td>807.0</td>
<td>51.6</td>
<td>627.4</td>
<td>31.3</td>
</tr>
<tr>
<td>FY2009</td>
<td>627.4</td>
<td></td>
<td>31.3</td>
<td></td>
</tr>
<tr>
<td>FY2010</td>
<td>670.0</td>
<td></td>
<td>40.0</td>
<td></td>
</tr>
</tbody>
</table>

* Forecast as of July 8, 2010
### Market Environment and NEC’s Business Situation

#### Market Environment

<table>
<thead>
<tr>
<th>FY2009</th>
<th>FY2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Market shrinkage due to the slowdown of world economy (-10~-15%)</td>
<td>● Recovery of world market (Approx.+5%)</td>
</tr>
<tr>
<td>● Continued shakeout of vendors and the rise of Chinese vendors</td>
<td></td>
</tr>
<tr>
<td>● Investment restraint by Japanese carriers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Continued investment restraint by Japanese carrier</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### NEC’s Business Situation

<table>
<thead>
<tr>
<th>FY2009</th>
<th>FY2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Significant sales decrease (approx.-20%)</td>
<td>● Sales increase (approx.+7%)</td>
</tr>
<tr>
<td>● Decreased in wireless overseas, such as PASOLINK</td>
<td></td>
</tr>
<tr>
<td>● Delayed in signing the contract of large scale project in submarine cable systems</td>
<td></td>
</tr>
<tr>
<td>● Impact of the appreciation yen</td>
<td></td>
</tr>
<tr>
<td>● Lowered the breakeven point by enhancing selling expense and development investment efficiency</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Forecast as of July 8, 2010
## Sales in FY2009

<table>
<thead>
<tr>
<th></th>
<th>FY2008 (Billions of Yen)</th>
<th>FY2009 (Billions of Yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed line in Japan</td>
<td>807.0</td>
<td>627.4</td>
</tr>
<tr>
<td>Wireless in Japan</td>
<td>approx.-20%</td>
<td></td>
</tr>
<tr>
<td>Fixed line overseas</td>
<td>approx.-30%</td>
<td></td>
</tr>
<tr>
<td>Wireless overseas</td>
<td>approx.-35%</td>
<td></td>
</tr>
</tbody>
</table>

### Japan
- Investment in Fixed Line NGN remained high, while the Investment in 3G decreased.
- Decreased due to investment restraint by carriers, delay of signing the contract of large scale project and the impact of the appreciation of the Yen.

### Overseas
- Decreased due to investment restraint by carriers, delay of signing the contract of large scale project and the impact of the appreciation of the Yen.

### Impact of the Appreciation Yen
- approx.-7%

### Decreased due to investment restraint in 3G by carriers

### Delayed signing the contract of large scale submarine cable project

### Decreased due to investment restraint by carriers but secured WW No.1 share for three consecutive years
Sales Forecast in FY2010

- **Japan**: Anticipate certain sales level while the investment in 3G decreased
  - Anticipate demands of existing network migration
- **Overseas**: Recovery of submarine cable systems and investment in wireless broadband
  - PASOLINK will expand compared with the last year due to increasing cellular subscriber in emerging market

- Submarine cable systems; APCN2 expansion etc.
- NetCracker; Expand the synergy business with NEC

Propose the service & management business to carriers and promote greater investment

- **Fixed line in Japan**: slight increase
- **Wireless in Japan**: slight decrease
- **Fixed line overseas**: approx.+40%
- **Wireless overseas**: approx.+10%

**FY2010 (Forecast)**

- **Fixed line in Japan (slight increase)**
- **Wireless in Japan (slight decrease)**
- **Wireless overseas (approx.+10%)**
- **PASOLINK**: Maintain and enhance our competitiveness by launching the new product. Approach to emerging markets
  - Femtocell; Expand the business in Europe

- Expand next-generation wireless broadband (LTE, WiMAX)
- Promote greater investment from carriers through smartphone demand

* Forecast as of July 8, 2010

(Billions of Yen)

**FY2009**

- **627.4**

**FY2010**

- **670.0**
Lowered Breakeven point

- Improved breakeven point by enhancing SGA and development investment efficiency
- Increase profit by top-line growth

Increase profit by top-line growth

Improved breakeven point by enhancing SGA and development investment efficiency

- Reduced breakeven point in FY2009
- +140.0 billion yen

Fixed cost reduction

+50.0 billion yen
Recent Achievements (1/3)

Steady progress of next-generation wireless broadband business
- Provide globally next-generation wireless broadband solution underlying cloud service

- PASOLINK; Secured WW No.1 market share for 3 consecutive years

- Commercial service started
- Field trial succeeded
- Lab trial succeeded
- Supplied Base station, Core network system, MBH Switch
- Selected as a vendor for base station
- World first, Provided IMS-based femtocell
- Trial succeeded
- Provided Base station
- Trial succeeded
Recent Achievements (2/3)

Completed two large-scale submarine cable system projects
Deployed domestic submarine earthquake observation system, also received first order from overseas market (Taiwan)
- NEC is the only supplier in Japan in the field of submarine system application

Projects completed in 2009

- Won Large-scale wavelength Expansion Project
  (Total length 19000Km, 40Gb/s)
- Total length 9500Km
  Maximum capacity 4.8Tb/s
- Total length 12000Km
  (NEC is responsible for 4300Km)
  Maximum capacity 3.84Tb/s

Started operation of submarine network observation system off the coast of Japan’s Kii Peninsula (DONET)
- Backbone cable
- Extended branching unit
- Observational equipment
- Toucheng 45 Km

Submarine Seismograph System; First order from Taiwan Meteorological Agency

NEC is the only supplier in Japan in the field of submarine system application.
Recent Achievements (3/3)

NetCracker expand platform implementation business for telecom carriers
- Won operations support systems from major Japanese and overseas carrier

Russia (September 2009)
VimpelCom Group

Germany (March 2010)
Deutsche Telekom AG

First order from NTTDoCoM
(December 2009)

Malaysia (June 2009)
Maxis Communications

New Zealand
(December 2009)
Telecom New Zealand

NetCracker®
France Telecom, Orange, WIND, MTC, SPRINT, Telestra, DiGi, Mobistar, COMSTAR Cote d'ivoire etc.
Delivered to 40 major global carriers
Our Strength

High response capabilities in Japan’s advanced broadband & mobile area

Secure high market share by responding requirements from advanced customers
- NGN Related Products (IMS/SIP): Approx. 65% market share
- LTE: Delivered wireless base stations, core network system, MBH switch for NTT DoCoMo
  Selected as a wireless base station vendor for KDDI
- WiMAX: Delivered wireless base station for UQ Communications

Global presence by providing high-reliable and high-quality products

Provide products and technologies cultivated as a partner of domestic customers
- PASOLINK: WW No.1 share for three consecutive years/ Delivered to 141 countries
- LTE/WiMAX: The only domestic vendor which has a delivery and trial record for overseas carriers
- Submarine cable systems: Positioning world top 3 vendor as a total solution provider including submarine line terminal equipment, repeaters and cables

Cloud solution capability utilized by the integration of IT and Network

Create and provide various cloud services by utilizing both IT and network assets
- Service operation management: Expand global business by the synergy with NetCracker (WW No.4 share)
- Cloud system Implementation: Meet various customer needs as "One NEC"
1. Business overview
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Mid-term Market Trends and Business Opportunities

**Rapid Spread of Smartphones**
- Cumulative shipments of 50 million iPhone
- Android handsets also undergoing rapid growth
- Usage of mobile rich content increasing

**Steep Rise in Demand for Mobile Phones in Emerging Countries**
- Rapid progress in the BRICs, Middle East, etc.
- Indian subscribers: 16 million per month, cumulative total of 620 million subscribers

**Increase in Video / Images / User-Generated Content, etc.**
- Video, games and SNS over mobile devices
- People around the world able to upload and watch video stored on servers around the world
- YouTube: accessed by over 20 million people each day

**Flattening of the World, Globalization of Enterprises**
- Transmission of data among different businesses
- International data centers

**Mobile Networks Becoming Increasingly Sophisticated and Fast**
- Major traffic has shifted from voice to data
- Increased speed of wireless access to accommodate the steep rise in mobile data usage

**Increased Traffic**
- Global rebuilding of mobile backhaul
- Demand for high-capacity transmission to different countries and massive data centers

**Progress of IT/Network Integration**
- Healthy demand for OSS/BSS, optimization services, etc.
- Progress of business transformations on telecom carriers
- Increased Carrier Cloud and IT system services
Steep Rise in Mobile Data

- Mobile usage patterns are evolving from voice to data
- Network services and IT Services are integrated
- Accelerate to transform business structure on Telecom Carriers

![Graph showing changes in worldwide mobile phone market](image)

**Changes in the Worldwide Mobile Phone Market**

- (millions of units)
- Ovum-RHK

![Graph showing rapid traffic increasing by smartphones](image)

**Rapid Traffic Increasing by Smartphones**

- Proportion of traffic by handset model on the AdMob Network (when 100 is taken as the index value in February 2009)
- February 2009, February 2010
- Mobile Internet Devices *
- Smartphones
- High-functionality Mobile Phones

![Graph showing shift in ARPU for domestic mobile carriers](image)

**Shift in ARPU for Domestic Mobile Carriers**

- Voice
- Data
- Company A, Company D, Company S

* iPod touch, Sony PSP, Nintendo DSi, etc.
Expenditure on network-related products accounts for roughly half of the total, and continues to trend upwards.

Expenditure on ICT services also accounts for a large proportion (35%).
Growth Areas in Telecom Carrier Market

- Increased portion in growth rates and actual amounts centered around mobile
- Growth rates in Emerging countries surpassing those in developed countries
- Growth rates of OSS/BSS and SDP exceeding those of Infrastructure

**Telecom Carrier CAPEX (by fixed/mobile)**

<table>
<thead>
<tr>
<th>Year</th>
<th>CAPEX (billions of US dollars)</th>
<th>CAGR (09→12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>273</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>350</td>
<td></td>
</tr>
</tbody>
</table>

**Carrier IT Spending (by region)**

<table>
<thead>
<tr>
<th>Region</th>
<th>CAPEX (billions of US dollars)</th>
<th>CAGR (09→12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed</td>
<td>266</td>
<td>3.7%</td>
</tr>
<tr>
<td>Emerging</td>
<td>315</td>
<td>9.3%</td>
</tr>
</tbody>
</table>

**Network Products Market (by product type)**

<table>
<thead>
<tr>
<th>Product Type</th>
<th>CAPEX (billions of US dollars)</th>
<th>CAGR (09→12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOMS</td>
<td>125</td>
<td>5.5%</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>135</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Source:

Graph produced by NEC based on Gartner data
1. Business overview
2. Mid-term business environment
3. **Key business strategy**
4. Measures to enhance global competitiveness
5. Toward achieving V2012
Mid-term Business Policy

Expanding C&C Cloud related business by focusing on primary business areas where NEC’s strength can be achieved

- IT System
  - Server
  - XaaS
  - ...

- Network Infrastructure
  - Mobile Backhaul
  - Submarine Cable System
  - Broadband Wireless Access
  - Submarine Cable System
  - PASOLINK
  - LTE / Femtocell / WiMAX

- Service & Management
  - OSS/BSS
  - Service Platform

- C&C Cloud
  - Service
  - IT/Network Platform
  - Terminals/Sensors

- Terminals
  - Thin Client System
  - Mobile Terminals (Smartphone, data card)
  - ...

Our goal:
Challenges for gaining prominent position in global markets while increasing growth and earnings profit
Achieving sales of 900 billion yen (Operating profit ratio: 9%) in the Carrier Network business in FY2012
### Key Business Areas

Focusing on business areas where NEC can capitalize on its strengths and secure attractive global business

<table>
<thead>
<tr>
<th>Key Business Area</th>
<th>Attractiveness of Market</th>
<th>Strength of NEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Wireless Broadband Access</td>
<td>Large Market, High Market Growth</td>
<td>Field-proven installation of LTE in Japan, Field-proven installation in Femtocell and WiMAX, IT and Network integrated solutions</td>
</tr>
<tr>
<td>2 Mobile Backhaul</td>
<td>Increase of mobile subscribers in emerging countries, Increase of packet demand and wide coverage due to adaptation of LTE</td>
<td>PASOLINK WW #1 share for three consecutive years, RF Technology, TDM/Packet Hybrid Network Technology</td>
</tr>
<tr>
<td>3 Submarine Cable System</td>
<td>Continuing demand for installation due to increasing international traffic</td>
<td>Top three global position, Operation Value Chain, Advanced optical technology (40Gbps digital coherent)</td>
</tr>
<tr>
<td>4 Service &amp; Management</td>
<td>Increasing demand for reduced OPEX, Increasing demand for value added services</td>
<td>NetCracker Ranked 4th WW share, Field-proven installation of Service Platforms in Japan</td>
</tr>
</tbody>
</table>
Wireless Broadband Access Network Business

Wireless broadband access network is the core component for Cloud solutions

- Focus on solutions that leads to data centric IT/NW
  - LTE: Major player for wireless broadband
  - Femtocell: Minimum investment and suitable for data services
  - WiMAX: For advanced users of wireless broadband

![Diagram showing Cloud Services, Public (Fixed), Public (Mobile), Home, Network, Services, Network, Hotspot, Investment in Wireless Broadband Access Equipment]

Investment in Wireless Broadband Access Equipment

- [millions of dollars]
  - LTE: 2000
  - Femtocell: 3900
  - WiMAX: 6100
  - Total: 9600

Source: NEC estimates based on various sources
LTE Business

NEC’s strengths
- Developed and promoted among the world’s top leaders. Introduced to the domestic market ⇒ Expanding global deployment
- Designed by utilizing all potential features of LTE
  1. Small size/ Low Power Consumption
  2. Adopts SON which reduces installation and operating costs, and maximizes system performances
- Provides End-to-End (E2E) solutions from base stations (eNodeB) to Core (EPC)

Market Oriented Strategy
- Japan: Steady implementation of projects for advanced customers
- Overseas: Focus on small cells that support high speed LTE and LTE Femtocells

LTE Network Products
- World’s smallest class Compact EPC

NEC’s SON (Self Organizing Network)
- Easy field work/installation (OneTouch)
  ⇒ Reduce installation and recovery time, and operation time
- Analyze radio quality, area communality, and user type
- Optimization by environment and user
- Supporting systematic optimization by users and area
Femtocell Business

NEC’s strengths
- Proven technology and achievement in the Femtocell market
  - World’s most advanced commercial record in IMS based Femtocell
  - Commercial records in Europe prior to other prominent competitors
  - Technology, know-how and skills fostered by 3G-FMC in Japan
- Technology and achievement in LTE-Femtocell

Market oriented Strategy
- Full scale development of LTE Femtocell
- Provide various services (Home ICT) by integrating with Home gateway

Supply record of Femtocell in domestic/overseas markets

Commercial Systems
- Softbank Mobile (World’s first IMS based system)
- SFR-France (RAN-GW method system)

Trial Systems
- Network Norway, TDC (Denmark)

Femto Forum’s Femtocell Industry Awards
“Femtocell Network Design and Technology Innovation”
Two Consecutive Years

Easy installation by using current broadband internet lines

Two Consecutive Years

24 June 2010
WiMAX Business

Global deployment with advanced customers

UQ Communications
- 2010.3 Started shipment of base stations
- Contribute to UQC’s proactive area expansion
- WiMAX Forum’s Wave2 (2.5GHz) Received certificate.
- Interoperability among different vendors

<Predominance of products and technology>
- Single outdoor/indoor unit by adopting a high amplifier

PasoWingsBS202

M-Taiwan Project
- 2007.5 Received order for trial
- Started demo-trial with Tatung in Oct.
- 2008.6 Established R&D Center
- 2010.3 WiMAX system for Tatung InfoComm began commercial operation

Crown Prince Hospital Foundation in Thailand
- 2008.8 Received order
- Connection to clinics within 5KM centering on Chiang Khong Hospital
- 2009.3 Service launched

<Diagram>

Global deployment with advanced customers

- Single outdoor/indoor unit by adopting a high amplifier

PasoWingsBS202

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Mobile Backhaul Business

The most important infrastructure to support the rapid increase in demand for both mobile telephone and mobile data services

- Secured highest quality of radio transmission technology and greater (non-price related) competitiveness through manufacturing
- Secured top market share by adopting advanced mobile backhaul

Supply record of PASOLINK (May, 2010)

Installed in 141 Countries

Source: Infonetics, Mobile Backhaul Equipment and Services
Combining NEC’s Wireless, Optical, IP and OSS technologies

- Capable of supporting both new and old systems cohesively and economically during the migration from 2G/3G to 3.9G (LTE)
- Provide E2E/Multilayer path management through integrated NMS and OSS, as well as high expandability and high reliability

### Application areas for current PASOLINK

- **Access**
  - TDM
  - Wireless

### Application areas for Next Generation PASOLINK

- **Access~Metro**
  - TDM/Ethernet
  - Wireless/Fixed (Optical)

Next Generation PASOLINK (Available soon)
Submarine Cable System Business Initiatives

1. Continuing demand for new cable installation due to steady increases in traffic from expanding international data transfers
2. NEC is one of the world’s top three vendors for providing E2E solutions, including cable manufacturing

Submarine Cable System Outline
- Max. Transmission Distance Approx. 12,000~13,000km
- Submarine relay station
- Max. Depth Approx. 8,000m

Construction of the “Unity” high capacity optical submarine cable (2009/11/1 Chikura)

Capacity of the Optical Submarine Cable among Asia and the Pacific

- Opening of new cables
  - Estimated increase of 30% p.a
  - ½ of max capacity in 2009

- Demand for installation of new cables
  - Estimated increase of 25% p.a
  - AAG, Unity Started
  - Usage capacity (Lit Capacity)

- Asia

- The Pacific
Strengthen Submarine Cable System Business

Competitive system provided by advanced optical transmission and submarine cable technologies

**Advanced Submarine Cable System Technology**

<table>
<thead>
<tr>
<th>Year</th>
<th>System Capacity (per fiber)</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>10G 128WDM System</td>
<td>1.92Tb/s</td>
</tr>
<tr>
<td>2009</td>
<td>40G 64WDM System (1st generation)</td>
<td>2.56Tb/s</td>
</tr>
<tr>
<td>2010</td>
<td>40G 96WDM System (2nd generation)</td>
<td>3.84Tb/s</td>
</tr>
</tbody>
</table>

- Received order for 40G large scale wavelength extension optical fiber submarine cable system (APCN2)
- Adoption of 40G digital coherent technologies 3,200km transmission

**OCC – SC500 Submarine Cable Structure**

- Fiber unit
- Tensile strength layer
- Insulation/outer layer
- Optical fiber
- 3 Split Steel

**Next generation submarine cable systems combining high performance, high reliability and cost benefits**

- (Features and Benefits of OCC-SC500)
- 17mm cable diameter, world's smallest class
- OCC’s original “3 Split Steel” technologies
  - Durable construction
  - High speed production
  - Avoid effects associated with welding
  - Reduced production process
Initiatives Towards Service & Management Businesses

- Provide solutions that contribute to increased sales and reduced operational costs for carriers
  - Improve capabilities for high value-added services through NEC's service platform products (NC7000 Series) (Smartphone-supported services, M2M-supported services, etc.)
  - Achieve optimum utilization of network resources and automation of service delivery with OSS/BSS (NetCracker)
OSS/BSS Business

- Large market share in OSS product essential in service diversification
  - Firm customer footprint and powerful consulting / sales strength at a global scale
- Contribute to significant operational costs reduction and revolutionary improvements
  → Business Transformation

Enhancement of the Management System
Achieved by NetCracker

Management System
- Expandability, Flexibility
- Advent of a range of services and prices

IP Networks
- Telephone
- Mobile Phone
- Data
- Video

Business Support System (BSS)
- Service Provisioning Support
- Service Quality Control
- Billing Management

Operational Support System (OSS)
- NetCracker

Growing OSS/BSS Market and NetCracker

The Best Practices Award
TM Forum Award 2009

- Receiving award at the TM Forum Awards

CAGR 7.0%
(2008 → 2012)

Analysis Mason

Fulfillment

Billing / Customer Care

Assurance

[millions of US dollars]
Enhancing OSS/BSS Business

- Enhance product lineup from fulfillment (service provisioning support) with highly competitive and a strong track record, to the fields of total OSS and TOMS.
- Expand the its market segments through synergy with NEC products family (MBH, Data Centers, etc.)

NetCracker incorporates NEC service platforms and applications proven through domestic market and provides SE / SI services in the global market.

Provide various features such as network optimization, under cooperating with the NEC products family.
## Service Platform Business: Services for Smartphone

Increase telecom carriers' profit through providing services for Smartphones etc.

### Smartphone Features
- Business application market
- Larger screens
- A multimedia device, not a phone
- Better with mobile mobile
- Compatibility and connectivity to the internet
- Integrated business tools

### Service Categories
- Smartphone Internet Service (Smartphone version of internet service)
- Movie / Video Services
- Community / P2P Services
- Seamless Converged (FMC) Services
- Business Use Services

### Services for Smartphone
- Apps + Personalized Ad Distribution
- E-book Services
- Movie / Video Vault Services
- Augmented Reality Services
- Voice Broadcasting Service
- Rich Communication Service
- Home ICT (M2M)
- Device Agnostic Service Platform
- ID Authentication/Private Information Service Platform
- Thin Client Service

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*Smartphones, iPad, PC, TV, Photo frame, etc.*
Service Platform Business: M2M

M2M (Machine to Machine) application on our service platform will create “Ubiquitous Networked Society”

Sensing
- Environmental sensing services
- Agricultural sensing services
  Visualization of weather and vegetation information

Telematics
- EV drive services
- Drive-Net-Navigation services
  Battery monitors for EV, collection service for recharging costs

Telemeter
- Home ecology services
- Remote monitoring services
  Monitor the volume of electricity in home power outlets, control on/off

Agriculture ICT Solution

Sensor Data
- Temp, Humidity
- Soil info
- Web camera

Farm
- Field Server
  elab experience

Farmers
- Farm Know-how

Sensor Info Portal
- Weather Info
- Web Camera
- Farmer
- Community

Telecom Carrier Service Platform: NC7000 Series

Telecom Carrier Network

OPEN API
- Sensor Info
- Matching
- Farm Smarts
- Device Mngmnt
- Workflow Mngmnt
- Certification

Info Release
- Temp, Humidity
- Atmospheric pressure, Rain
- Solar radiation
- Remote monitoring
- Harvest, fertilize, pest control

▌

M2M (Machine to Machine) application on our service platform will create “Ubiquitous Networked Society”
Toward C&C Cloud

Telecom carrier network with high speed and mobility is the foundation of cloud services
Focus on creating cloud environments, smart grids and IT/NW integrated platforms

<table>
<thead>
<tr>
<th>Cloud Services/Cloud Environment Building</th>
<th>C&amp;C Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud-oriented services</td>
<td>PaaS: Platform as a Service</td>
</tr>
<tr>
<td>Proof in NEC Intranet</td>
<td>Strengthen Digital Signage</td>
</tr>
<tr>
<td>Small/Mid-sized SaaS</td>
<td>Managed desktop services</td>
</tr>
<tr>
<td>▲</td>
<td>▲</td>
</tr>
<tr>
<td>NGN/LTE Construction</td>
<td>OSS</td>
</tr>
<tr>
<td>▲ Public cloud construction by telecom carriers (international)</td>
<td>▲ Growing orders from international telecom carriers</td>
</tr>
<tr>
<td>▲ Managed desktop services</td>
<td>▲</td>
</tr>
<tr>
<td>▲</td>
<td>Smart Grid</td>
</tr>
<tr>
<td>Public Safety</td>
<td>Municipality Clouds</td>
</tr>
<tr>
<td>▲</td>
<td>Commercial Telematics (logistics)</td>
</tr>
<tr>
<td>▲</td>
<td>Smart Infrastructure (Transport)</td>
</tr>
<tr>
<td>▲</td>
<td>OpenFlow</td>
</tr>
<tr>
<td>Cloud Platform Suite</td>
<td>▲</td>
</tr>
<tr>
<td>▲</td>
<td></td>
</tr>
<tr>
<td>IT/NW Integrated PF</td>
<td></td>
</tr>
</tbody>
</table>

Telecom Carrier

FY2009 ~ FY2012

Growing orders from international telecom carriers

Public cloud construction by telecom carriers (international)

Global deployment of cloud-oriented data centers

Managed desktop services

Cloud-oriented services

Proof in NEC Intranet

Strengthen Digital Signage

Small/Mid-sized SaaS

NGN/LTE Construction

OSS
Carrier Cloud Business

| Establish the Carrier Cloud business on a global scale, with IT and network technology and expertise |
| Expand experiences in Telefonica across telecom carriers in Europe |
  * Order for SaaS system by Telefonica Spain (July last year) *
  * Agreement of joint rollout for cloud business in Latin America with Telefonica (February) |

Established in NEC Ibérica (Madrid, Spain), a subsidiary of NEC Europe Ltd.

Establishment of Global Competence Center

Abiko NGN Conformance Center

ADSL environment in telecom carriers is simulated and verified at the Conformance Center in the NEC Abiko Plant.
Smart Grid Business

- Apply various products and technologies in Carrier Network Business to energy networks as well.
  (Wire line and wireless network, network management, customer and usage management, etc.)

Establishment of Smart Network Businesses and Technologies

- Create businesses with partners
  - Smart meters (automated meter reading systems)
  - HEMS (home energy management systems)
  - Quick chargers for electric vehicles

Visit the following link for more information:
http://www.jisc.go.jp/jisc/data/soukai/018/san03.pdf
1. Business overview
2. Mid-term business environment
3. Key business strategy
4. Measures to enhance global competitiveness
5. Toward achieving V2012
Enhancing the Global Business Structure

- **New structure of the five-region global structure and human resource development**
  - Accumulation of expertise through the creation of regionally-developed solutions and establishment of competence centers

- **Ensure competitiveness through off-shore activities and actively utilize M&A / partnerships**

### Overseas Sales (Existing business/Key business)

- **2009**
  - Existing Business
  - Key Business

- **2012 FY**
  - Services & Management
  - Submarine Cable system
  - Mobile backhaul
  - Wireless Broadband Access

### Establish competence center/Create solutions
- Femtocell (London)
- Cloud (Spain)
- NetCracker Business Expansion (North America)
- Service Business Expansion (Latin America)

### Global human resource
- **(GTI: Global Track to Innovator)**
  - Program training for the early development of human resources who will work globally in the future.
  - Local work experience in each specialized area for 1 to 2 years

### Offshore Activities
- 25% of outsourced development done offshore (2012)
- Expansion of offshore fields (SI/SE/contact centers, etc.)

### M&A, Partnerships
- Full utilization of the assets of acquired companies (NetCracker, OCC, NEC Eastern Europe)
- Partnerships, enhancement of ecosystems
  - NGN Partnership Program
  - OEM Partners (UbiquiSys, Juniper, Kineto, etc.)
Enhancing Product Strength through Base Technologies

### Differentiation with core technologies → Enhance global competitiveness of products in focused areas

<table>
<thead>
<tr>
<th>Apply Radio Frequency Amplifiers with World-Class Efficiency to LTE/WiMAX Base Station Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Reduce the size and power consumption of base station units, reducing installation space and power consumption, and cutting the costs of installation and operation</td>
</tr>
<tr>
<td><img src="image1" alt="High-Efficiency Radio Frequency Amplifier" /></td>
</tr>
<tr>
<td>Achieve a power amplification efficiency of over 45%</td>
</tr>
</tbody>
</table>

### Realization of World’s First 100G Long-distance Real-time Digital Coherent Communication

<table>
<thead>
<tr>
<th><img src="image3" alt="Received Signal" /></th>
<th><img src="image4" alt="Received Waveform after Digital Signal Processing" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>● Develop a transponder that carries out long-distance optical transmission in real-time with a 100G digital coherent optical transmission system. “Success in real-time communication over a 1,520 km long-distance optical transmission section in Verizon field trials.”</td>
<td></td>
</tr>
</tbody>
</table>

### Practical Application of 40G Submarine Optical Cable System Terminal Equipment

<table>
<thead>
<tr>
<th><img src="image5" alt="NS Series T640SW / 40G Transponder" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>● First-ever application of optical wavelength multiplex terminal equipment fitted with a 40G transponder in a wavelength expansion project for the APCN 2 large-scale submarine optical cable system</td>
</tr>
</tbody>
</table>

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Empowered by Innovation
Enhanced Competitiveness through QCD Reforms

Management innovation from innovation in plant production throughout overall business, including front-loading.
- Production innovation: Put QCD reforms into practice at production sites.
- Front-loading: Incorporate QCD at the product planning and development design stages.

→ Q: Quality Reform
- Strengthening of development/design upstream processes
- Enhanced management of purchased components

→ C: Cost Reform
- Setting of cost targets in anticipation of market prices
- Thorough screening of project orders
- Increased offshore and multi-vendor utilization

→ D: Delivery Reform
- Shorten total lead times
  - Shortened development times
  - Expand production for firm orders

[Carrier Network Business] [Main Base (NEWIN)]

<table>
<thead>
<tr>
<th>Quality Loss Cost (Ratio to Sales)</th>
<th>In-Process Defect Rate (Mobile Line)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2% Improvement</td>
<td>Part of Production for New Models</td>
</tr>
<tr>
<td>FY2007    FY2008    FY2009</td>
<td>Maintaining Zero Defects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount of Cost Reform (Ratio to Sales)</th>
<th>Improved Productivity (Regular Volume per Person)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.8% improvement</td>
<td>2.9 times/3 years</td>
</tr>
<tr>
<td>FY2007    FY2008    FY2009</td>
<td>(reference index 1.0 in second half, 2006)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inventory Turnover Period (Liquidity)</th>
<th>Percentage of Orders Handled with a Lead Time of “less than three weeks” (Supply Lead Time from Order Receipt to Shipping)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-day improvement</td>
<td>26% increase</td>
</tr>
<tr>
<td>FY2007    FY2008    FY2009</td>
<td>(PASOLINK)</td>
</tr>
</tbody>
</table>

Enhanced Competitiveness through QCD Reforms

*Management innovation from innovation in plant production throughout overall business, including front-loading.*

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5. Toward achieving V2012
## Toward achieving V2012

**Our goal:**
900 billion yen in sales (operating profit margin 9%) by FY2012

<table>
<thead>
<tr>
<th></th>
<th>FY2009</th>
<th>FY2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overseas Sales ratio</td>
<td>28%</td>
<td>40%</td>
</tr>
<tr>
<td>Key Business ratio</td>
<td>34%</td>
<td>50%</td>
</tr>
<tr>
<td>Operating profit ratio</td>
<td>5%</td>
<td>9%</td>
</tr>
</tbody>
</table>

(Billions of Yen)

### Key Business

- Wireless Broadband Access
- Mobile Backhaul
- Submarine Cable System
- Services & Management

*Forecast as of July 8, 2010*
Empowered by Innovation

NEC
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