Pictures of the Future: Research and Development at Siemens

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Innovations have kept Siemens strong for 158 years

Outstanding innovations and sales development by Siemens AG, 1847 – 2005

Sales (in logarithmic scale)

1847 1866 1879 1924 1926 1958 1959 1973 '74 '80 '81 '84 '92 '03

Year of introduction

1853 first office St. Petersburg
Siemens – Global Network of Innovation (1)

Global presence
(in more than 190 countries)

Production sites

- NAFTA
- GER
- EUR ohne D
- APAC
- SAM
- AFR

North America
Europe
Middle East
Asia / Pacific
South America
Africa

430,000 employees worldwide
- 164,000 (38%) in Germany
- 110,000 (26%) in Europe (w/o Ger)
- 95,000 (22%) in North America
- 52,000 (12%) in Asia-Pacific
- 9,000 (2%) in other countries

Source: CD S 8 - 11/04

Broad scope of business
(6 business segments, 13 Groups + SFS, SRE)

- Medical
- Transportation
- Lighting
- Power
- Automation and Control
- Information and Communications

External sales in billions of €
w/o SFS, SRE) - FY 2003/04
Siemens – Global Network of Innovation (2)

R&D expenditure in 2004: 5,1 billions of € …

<table>
<thead>
<tr>
<th>Company</th>
<th>Expenditures in billions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siemens</td>
<td>5,1</td>
</tr>
<tr>
<td>Matsushita</td>
<td>4,6</td>
</tr>
<tr>
<td>IBM</td>
<td>4,6</td>
</tr>
<tr>
<td>Sony</td>
<td>4,0</td>
</tr>
<tr>
<td>HP</td>
<td>3,9</td>
</tr>
<tr>
<td>Samsung</td>
<td>2,9</td>
</tr>
<tr>
<td>Hitachi</td>
<td>2,8</td>
</tr>
<tr>
<td>Toshiba</td>
<td>2,6</td>
</tr>
<tr>
<td>GE(^1)</td>
<td>1,8</td>
</tr>
<tr>
<td>Del I</td>
<td>0,5</td>
</tr>
</tbody>
</table>

Source: Siemens AG, CD S 8 – 11/04

… more than 50% for Software

(/worldwide about 30 000 Software engineers)

Corporate Technology
### Corporate Structure

**Managing Board**

<table>
<thead>
<tr>
<th>Operations</th>
<th>Corporate Departments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information and Communications (COM)</td>
<td>Corporate Finance (CF)</td>
</tr>
<tr>
<td>Siemens Business Services GmbH &amp; Co. OHG (SBS)</td>
<td>Corporate Personnel (CP)</td>
</tr>
<tr>
<td>Transportation Systems (TS)</td>
<td>Corporate Technology (CT)</td>
</tr>
<tr>
<td>Siemens VDO Automotive AG (SV)</td>
<td>Corporate Development (CD)</td>
</tr>
<tr>
<td>Medical</td>
<td>Corporate Centers:</td>
</tr>
<tr>
<td>Medical Solutions (Med)</td>
<td>Corporate Communications (CC)</td>
</tr>
<tr>
<td>Siemens Logistics and Assembly Systems (L&amp;A)</td>
<td>Corporate Information and Operations (CIO)</td>
</tr>
<tr>
<td>Siemens Building Technologies AG * (SBT) Lighting</td>
<td>Global Procurement and Logistics (GPL)</td>
</tr>
<tr>
<td></td>
<td>Chief Economist / Corporate Relations (ECR)</td>
</tr>
<tr>
<td>Osram GmbH</td>
<td>Management Consulting Personnel (MCP)</td>
</tr>
<tr>
<td>Siemens Real Estate (SRE)</td>
<td>Legally Separate Group</td>
</tr>
</tbody>
</table>

**Regional Units**: Regional Offices, Regional Companies, Representative Offices, Agencies
Business Model of Corporate Technology

Goal: Creation of Economic Value Added for the Company

- Cross Business Group/Segment Technology Strategies for the Company
- Projects for the Business Group (Contract R&D)
- Projects to build up new competences
- Core Business
- New Business opportunities by external commercialization of technologies and IPRs
- External Business

Innovations Strategies

- Pictures of the Future
- Markets
- Trends
- Technology
- Business Opportunities
- Technology Screening & Analysis

International Network of Competences - Worldwide Partner for Innovations

• Spin off’s (STA, TTB*)
• IP marketing
• External marketing of technological services

* Partnership with A&D, including spin-in's

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# Structure of Corporate Technology (Status: October 1, 2004)

## Corporate Technology

### Technology Divisions
- Materials & Microsystems
- Production Processes
- Power & Sensor Systems
- Software & Engineering
- Information & Communications

### Corporate Intellectual Property
- Intellectual Property Services
- Regional Intellectual Property
- Intellectual Property Support
- Company Name & Trademark Law

### Corporate Functions
- Standardization & Regulation
- Information Research Center
- Environmental Affairs
- Technical Safety

### Business Administration and Controlling

### Human Resources

### Chief Information Officer

### International Relations & Projects

### Strategic Marketing

### Strategic Planning

### Siemens Corporate Research, Inc. 2)

### Siemens Ltd. China Corporate Technology 2)

### SISL CT 2)  
OOO Siemens CT 2)

### Siemens Technology Accelerator GmbH 2)  
Technology-to-Business Center, LLC 2)

### Roke Manor Research, Ltd. 1)

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1) Functional reporting to Corporate Technology

2) Separate Legal Entity; Part of Separate Legal Entity
Corporate Technology: About 1,700 Researchers and Developers Worldwide …

New Sites planned in 2005:
- Shanghai
- St. Petersburg
- Moscow
Corporate Technology: International Network of Competences – Worldwide Partner for Innovations

* functional reporting
Materials & Microsystems

- Functional Materials for Optoelectronics
- Polymerelectronic
- Ultrafast Ceramics for Computed Tomography
- Functional Polymers
- Ceramics
- Innovative Electronics
- Design to Prototype (D2P)
- Micromechanics & Coatings
- Project: Environmentally Compatible Products
- Packaging & Assembly
- Analytics
- Joining Technologies
- Electronic Assembly
- Parallel Optical Link
- Multichip Module for Radar Evaluation
- Eco-Design of Products
- Materials Analysis by Ion Bombardment
- Joining of Plastic Materials

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From Concept to Product

Innovative Manufacturing Technologies and Processes

Become Front-Runner with holistic Solutions

Service Strategies and Processes

Service Management

Holistic Processes

Product Definition

Virtual Engineering

Simulation & Risk Management

Optimized and reliable Products

Realized Manufacturing Technologies and Processes

World Class Manufacturing Process

Structure

Logistics

Technology

Remote Service Center

Field Service

Innovation with System

From Concept to Product

With virtual Products and Processes to shorter Time to Market

Risk Analysis of hybrid Systems

Virtual Engineering

Manufacturing Engineering

Simulate & Risk Management

Product Definition

With virtual Products and Processes to shorter Time to Market

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CT / E 090-2 a - 05.03
The Time Horizons of the R&D Activities of the Business Groups and of Corporate Technology are Different

A seamless transition from R&D in Corporate Technology to the Business Groups is crucial for our success.
CT’s Technology Divisions: „Driver“ and „Provider“ of Innovations and Technologies

Strategic principles
- Focus & Multiple Impact
- Key Account Management
- Networking internally & externally
- Systematic Technol.&Innov. Planning
- „Strengthen the strength“
- Acting as entrepreneurs
- Decentralization of responsibilities
- Performance differentiation
Technology-to-Business Center and Siemens Technology Accelerator

- Driving innovative technologies for “emerging markets”
- Combining technology and business orientation
- Generating new business through innovations:
  - embedded in existing Siemens structures
  - as start-up foundation
- Providing support through “seed money” from the business partners

Impact on innovation and entrepreneurship culture
Strategic Planning of Innovations & Technologies

The combination of extrapolation and retropolation leads to the **Pictures of the Future**
Pictures of the Future

: Detailed Description of All Relevant Trends of Our Business Segments

Socio-economic trends
- society
- life of work

Market trends
- size / growth
- structure
- geographical

Customer / business trends
- value chains / networks
- company’s structure
- processes

Technological trends
- strategic importance
- multiple impact
- disruptive
Future Electrical Engineering and Electronics: Main Trends
with Relevance to Technology and Key Technologies

Core competence: interdisciplinary research and knowledge management
Aspects for the Cooperation With the International public research

Research and development

Training/Education

Experience-sharing

Equipment, training material, partnerships with schools

Temporary student employees, interns, students working on theses, doctoral candidates, appointments to chairs and other teaching assignments

Awards, scholarship

Bilateral research projects, contract research

Publicly funded projects

Recruiting

Symposia / workshops

“Siemens sponsors”

Structure of the research landscape, overall legal situation

Future markets, labor situation, knowledge society

Requirements profiles for engineers and scientists, internationalization, curricula, contributions to the work of associations
Scientific Cooperation with International Public Research Institutions is of Great Importance for Siemens

- It helps integrating our R&D base in areas in which we do not (yet) have expertise of our own.
- It gets us in touch with the latest results of basic research and likewise supports the understanding of the research partner for modern applications.
- It facilitates recruiting top-notch young talent in the areas of engineering and science.
- It builds up our image by giving us a presence in the “scientific community”.

We also support university research and education by supplying experts for about 350 teaching and visiting positions.
When the winds of change are blowing, some build shelters and some build windmills.
Siemens Corporate Technology: Mission, Vision and Strategy

Goal: Creation of Economic Value Added for the Company

Mission:
- Securing the technological future and
- Increasing the competitiveness of the company in close cooperation with the Business Groups and Regional Units

Vision
- Network of Competences
- Partner for Innovations

Strategy
- Concentrating on core technologies
- Internal and external networking and cooperation
- Increased customer orientation
- Decentralizing responsibilities and fostering technopreneurship
- Success-oriented allocation of resources
- Systematic innovation and technology planning process
The Top Ten Companies in Electrical Engineering and Electronics in Fiscal Year 2004

Total sales (in billions EUR)
Sales in electrical engineering and electronics (in billions of euros)