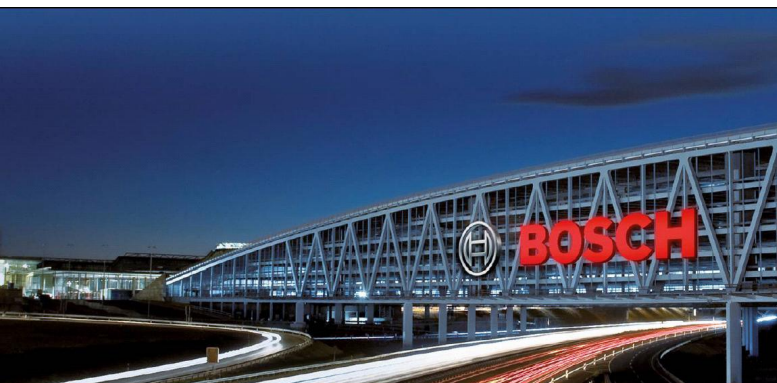


Track I: Diverse perspectives



Design for all: Women & Engineering



Dr. Maria Rimini-Döring
Corporate Sector
Research and Advance Engineering
Robert Bosch GmbH, Germany

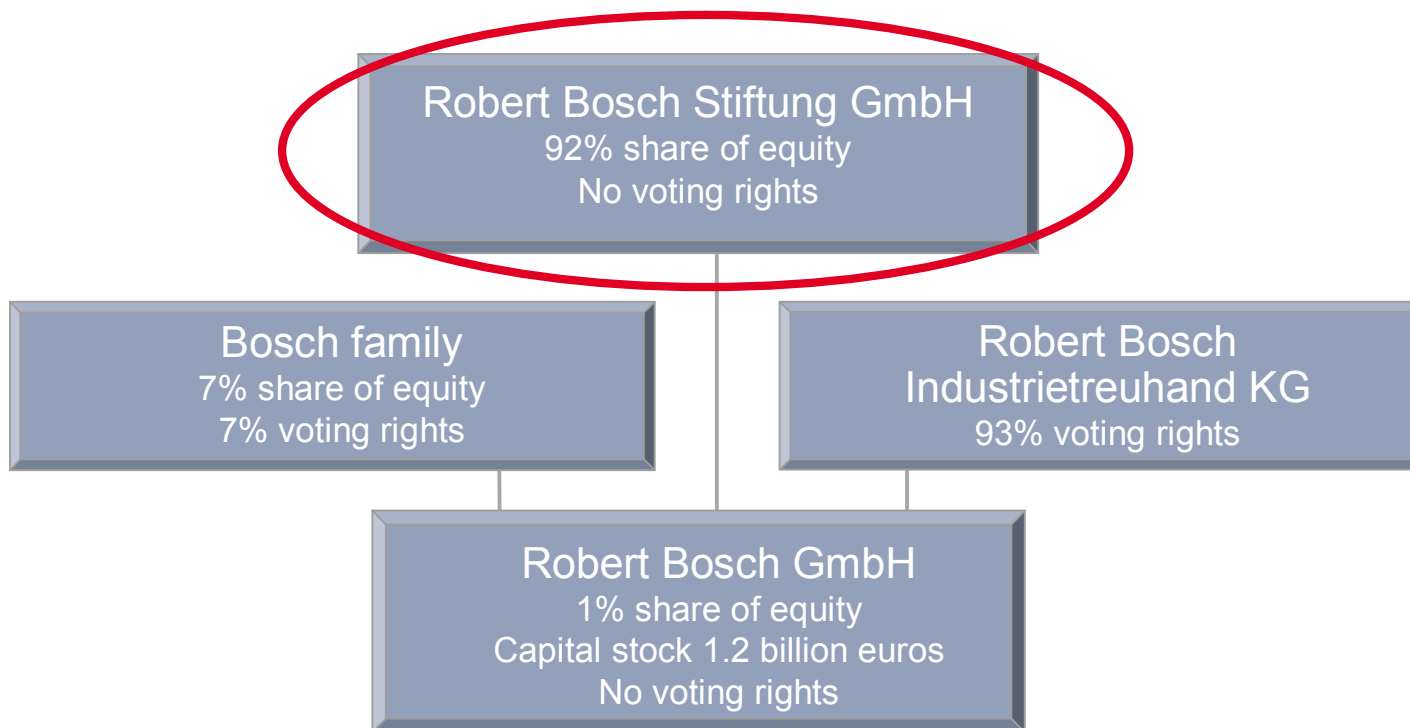


Overview

- The Bosch Group
- Data on Women and Engineering
- Diversity
- Diversity and Fairness
- Diversity and Responsibility



A “diverse” ownership structure



Key data

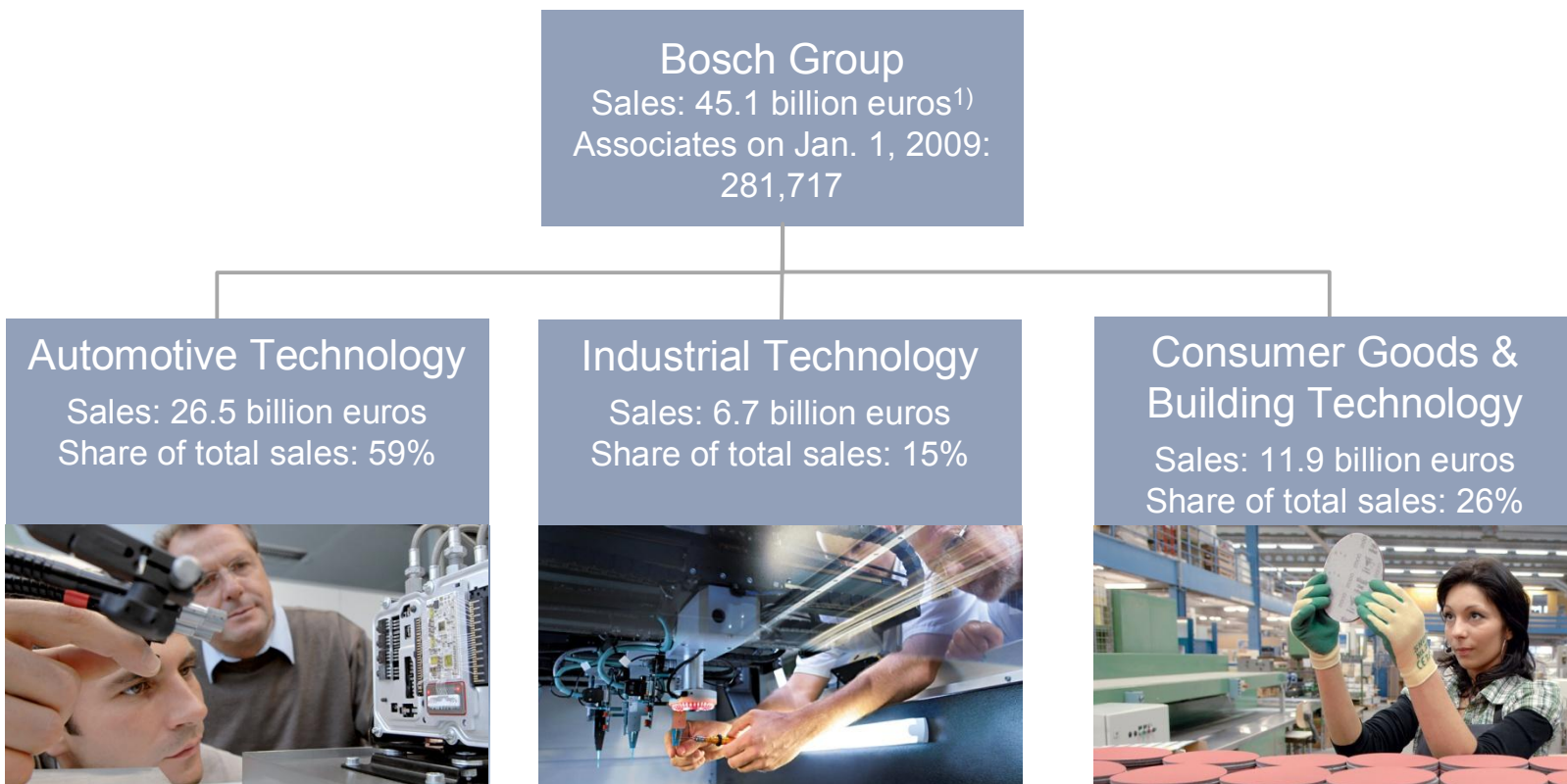
	2007	2008
Sales revenue*	46,320	45,127
Associates ¹⁾	271,265	281,717
located in Germany	112,300	114,360
located outside Germany	158,965	167,357
Capital expenditure*	2,634	3,276
Research and development cost*	3,583	3,889
Profit before tax*	3,801	942
Profit after tax*	2,850	372

¹⁾ As per January 1, 2008/2009

* Currency figures in millions of euros



Structure of the Bosch Group: Diversity!



¹⁾ Including other business areas

Structure of the Bosch Group

Bosch Group
Sales: 45.1 billion euros¹⁾
Associates on Jan. 1, 2009:
281,717

Automotive Technology

Sales: 26.5 billion euros
Share of total sales: 59%



Industrial Technology

Sales: 6.7 billion euros
Share of total sales: 15%



Consumer Goods & Building Technology

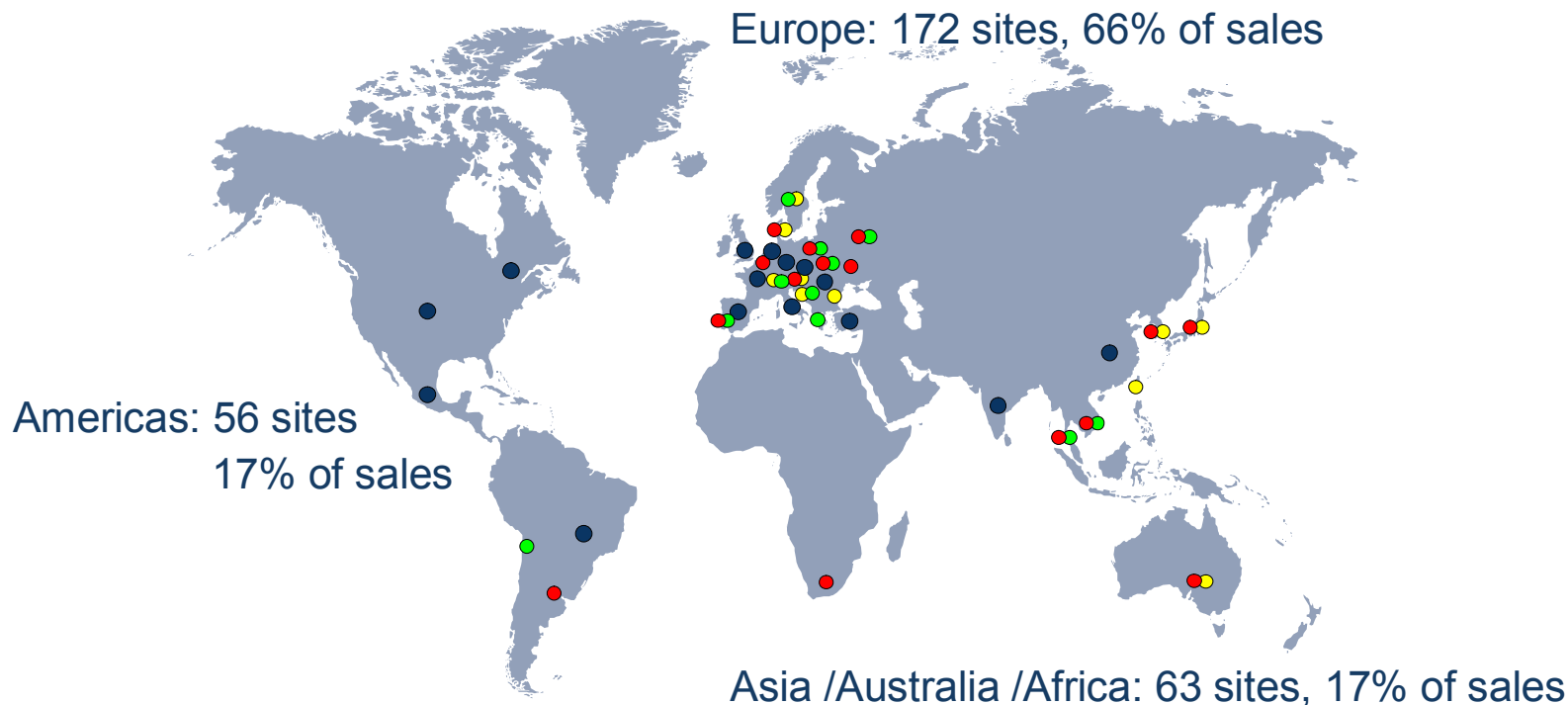
Sales: 11.9 billion euros
Share of total sales: 26%



¹⁾ Including other business areas



International manufacturing sites



RB	:	291 manufacturing sites in	37 countries	● = ●●●
● UBK	:	131 manufacturing sites in	30 countries	
● UBI	:	97 manufacturing sites in	25 countries	
● UBG	:	80 manufacturing sites in	26 countries	

As per January 2009



BOSCH

Patent ranking

In 2008, Bosch first-filed 3856 inventions.

Bosch is the global technological leader in its business areas. This is also shown by its ranking for patent applications:

- **DE:** **No. 1** (Deutsches Patent- und Markenamt)
- **EP:** **No. 6** (European Patent Office)
- **PCT(WIPO):** **No. 5** (World Intellectual Property Org.)

In automotive technology:

- **DE:** **No. 1** (Deutsches Patent- und Markenamt)
- **EP:** **No. 1** (European Patent Office)
- **PCT(WIPO):** **No. 2** (World Intellectual Property Org.)

DE, EP, WIPO: published patent applications

A steady flow of bright ideas—
15 new
patents every working day



www.bosch.co.uk



BOSCH

Robert Bosch Stiftung

- Established: 1964
- **Supports solely charitable purposes**
- 92% of the company's 1.2 billion euro capital stock is held by the Stiftung
- Total project grants 2008: 60 m euros
- Grants from 1964 to 2008: **900 m euros**

Areas supported:

- Health and humanitarian aid
- **Science and research**
- International relations – Western, Central and Southeast Europe, USA, CIS, Turkey, Japan, China, India
- **Education and society**
- Society and culture

For more information, visit www.bosch-stiftung.de



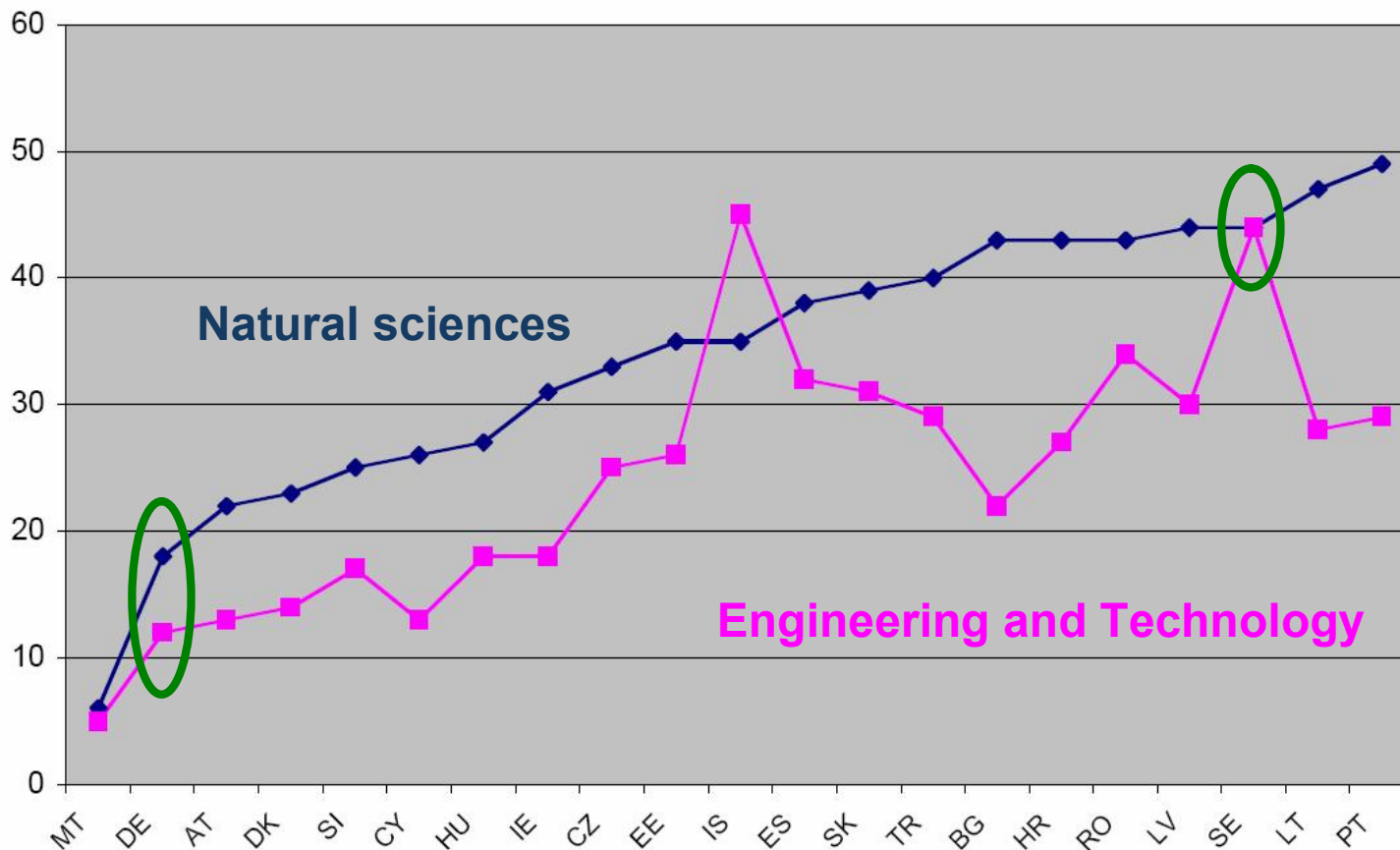
BOSCH

Overview

- The Bosch Group
- **Data on Women and Engineering**
- Diversity
- Diversity and Fairness
- Diversity and Responsibility



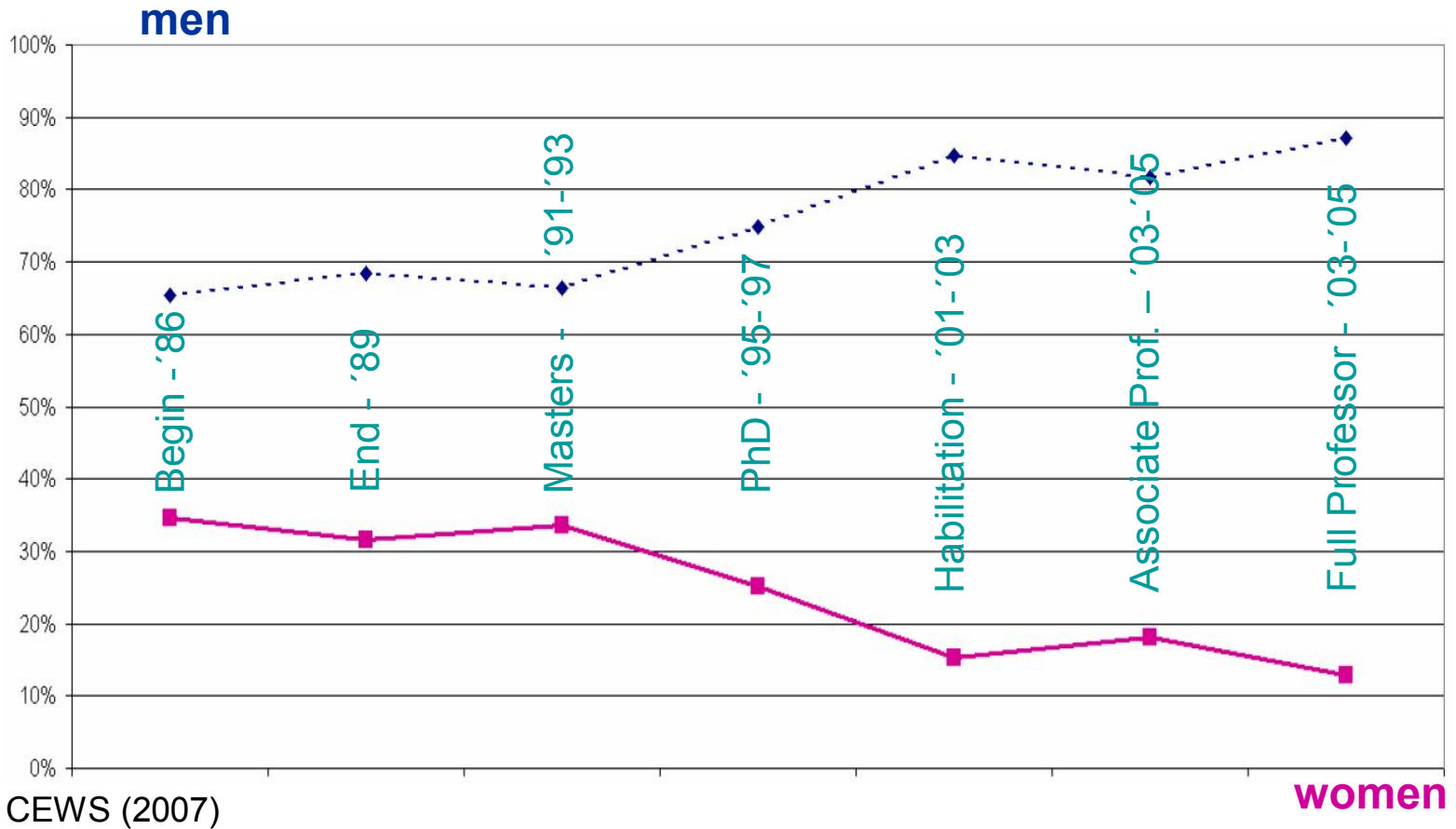
Women in Higher Education Institutions



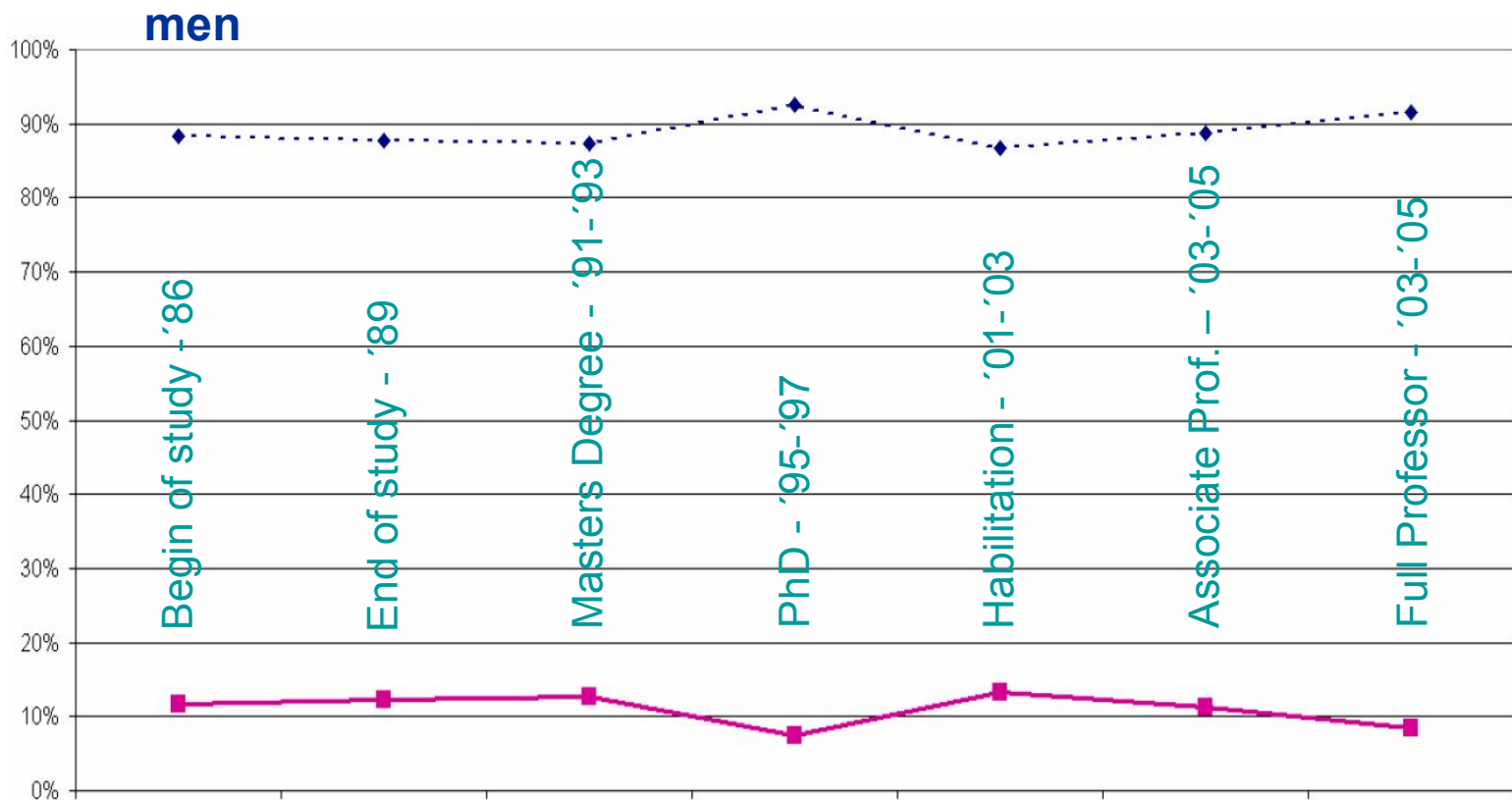
European Commission: "She Figures 2009" – Preliminary Data



Natural Sciences (1986 – 2006)



Engineering (1986 – 2006)



CEWS: Lind/Löther (2007)

women



BOSCH

Why is the engineering pipeline not leaking?

→ Selection hypothesis

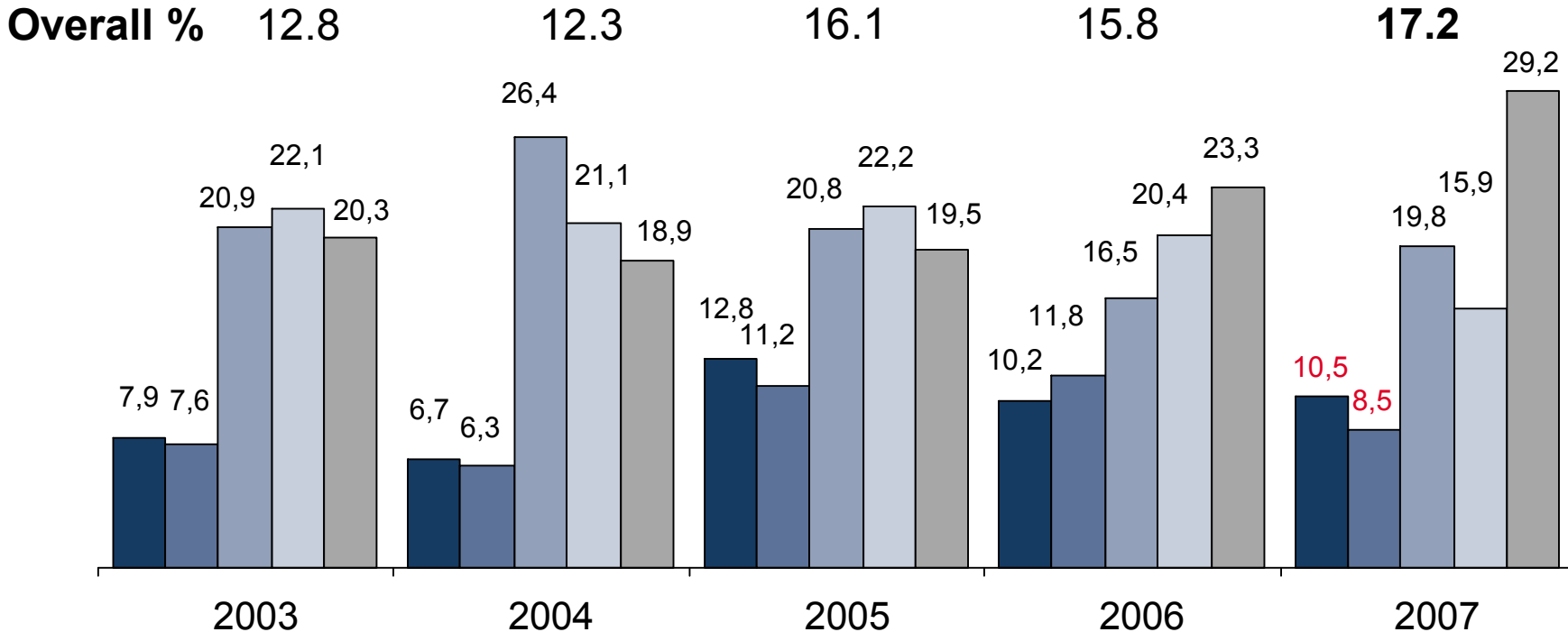
- Young women decide to undertake a study and career in engineering only after careful consideration
- They are strongly motivated and on the average better and faster than the male students
- **Most of them have at least one parent working in SET**

→ Epistemic cultures

- Subjects with standardised objectives show a better chance of women careers (consensus over methods and results overcomes gender discrimination)
- Science and Engineering require team work (social skills)
- SET allows a better separation of private and working environment (social role vs. performance)

Dr. Hildegard Matthies, WZB Social Science Research Center Berlin, <http://www.wzb.eu/>

Women % of new engineer associates at Bosch



- Mechanical
- Electrical/Electronics/Communications
- Informatics
- Economics Engineering
- others



Overview

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Bosch Values

1. Future and Result Focus
2. **Responsibility**
3. Initiative and Determination
4. Openness and Trust
5. **Fairness**
6. Reliability, Credibility and Legality
7. **Cultural Diversity**



Cultural Diversity

- Successful **solutions** (not only products) need **Diversity**
- “Cultural diversity” includes gender diversity
- Women in our societies generally share a wider spectrum of experiences with
 - Age (parents, children, peers)
 - Gender
 - Setting (at home, at work, at school, ...)
 - Health and handicap, body strength
 - Communication, transportation means...
 - Time (flexible and overlapping time slots...)
- In developing countries they sustain the whole economy (micro-credits...)
- Their input is needed to bring a new focus, new goals, a different approach for

NEW and BETTER solutions



Overview

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Associates

High-quality training

Every year, more than 6,000 young people around the world receive occupational training at Bosch.

Attracting young talent

Bosch has many activities to attract young talent, especially on an international level.

Support

Apart from attractive development programs for associates, Bosch attaches importance to internal career planning within the framework of its manager development schemes.

Equal opportunities

Flextime working models, childcare, and equal opportunities for women make Bosch a more attractive employer.

Demographic change

Bosch values the experience of its older associates, and employs measures specifically designed for them.

Competence management

In 2008 alone, Bosch invested some 200 million euros in training for its associates. A structured and systematic approach ensures that the skills needed are available in the right place at the right time.

International presence

In 2008, some 2,500 specialists and managers were working on long-term assignments outside their home countries.



Fairness

- **Design for all** means **accessibility** and **inclusiveness**
 - Better design opens chances for everyone
- As in the case of architectural barriers, e.g. curbs
 - From wheelchairs to bicycles, buggies, scooters, trolleys, walking frames, coaster wagons...
- It includes the whole scope of engineering education and research
 - Student selection criteria
 - Title and topics of classes
 - Teaching methods
 - Training material
 - Choice of research topics
 - Funding criteria
 - Experiment design
 - Selection of test subjects...



Overview

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- **Diversity and Responsibility**



Responsibility: Saving energy – a Bosch strength



powertrains



solar heating systems



photovoltaics



gearboxes for wind turbines



innovative power tools
with lithium-ion technology



energy-efficient
household appliances

Some 45% of R&D expenditure goes into products that protect the environment and conserve resources. In 2008 alone more than 1.5 billion €.

Diversity and Responsibility: large scale

→ **Mobility**

- Design of transportation means
- Optimization of energy consumption
- Safety concerns in the development of assistance systems...

→ But also necessary **dialogue** with other sciences

- Architecture and city planning (where do we want to live?)
- Sociology (how does society influence the need for mobility?)
- Cultural Anthropology (what do cultural differences implicate?)
- History and history of art (e.g., can we build a subway in Rome?)
- Demography (which population structure do we expect?)
- Medical science (which support is needed?)
- Environmental Sciences (what is the impact of mobility?)

→ **Responsibility** (also) of the engineer to pursue **interdisciplinary exchange**



Diversity and Responsibility: small scale

→ Human-Machine Interaction

- Usability
- Intuitive learning
- Error tolerance
- Controllability
- Trust

→ Consider and value diversity of

- Situations
- Users' capabilities, expectations, goals
- Environmental and cultural frame

→ **We need more women in engineering**



Bosch activities start at early age

- **Knowledge factory**: technology and science for children and adolescents
- **Girls' Campus**: for female in upper secondary school
<http://www.bosch-stiftung.de/content/language2/html/11121.asp#>
- **CyberMentoring** for high school girls by women researchers
- **Mentoring** for young women associates within and outside Bosch
- **Coaching** for better leadership
- **Endowment professorships**: promotion of university-level research and innovative teaching methods

