

# Scientists in Demand

**What's keeping students from pursuing careers in science?**

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## Worth thinking about

In Germany alone, there are more than a 1,000 initiatives aimed at making science and technology more popular (MoMoTech-Survey)

If young people still don't respond, there are two possibilities:

Either they're too dumb to recognize the advantages -  
or they're too clever to ignore the disadvantages!

*But:*

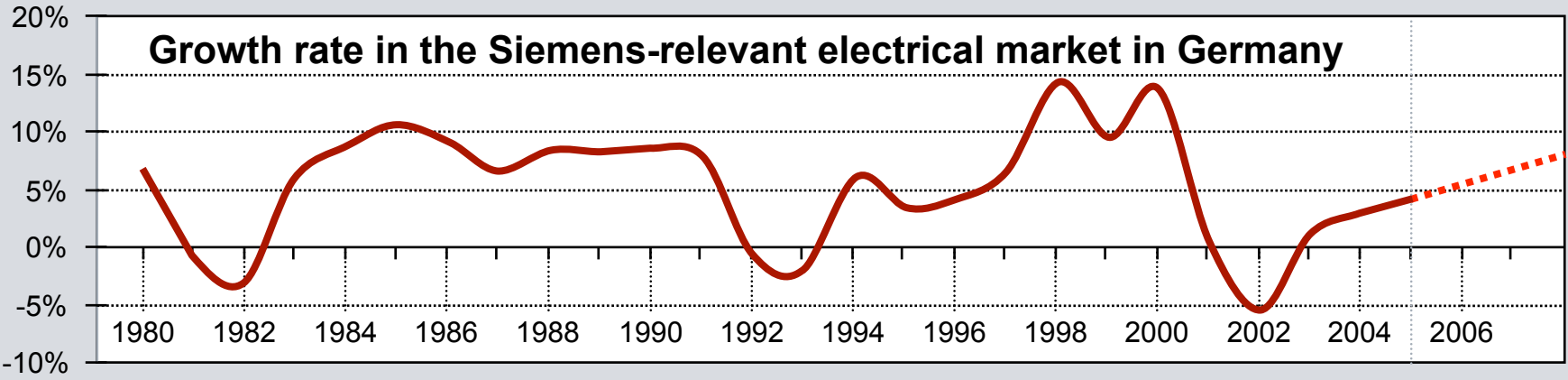
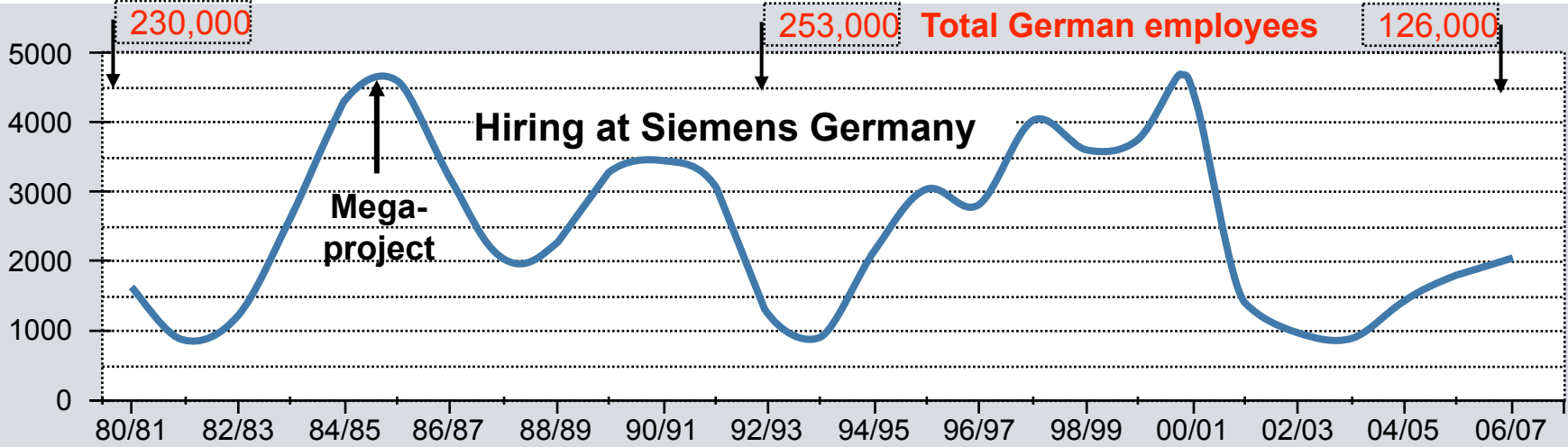
Do we want dumb scientists and engineers?

So how about taking their possible concerns seriously?

## Structure of my presentation

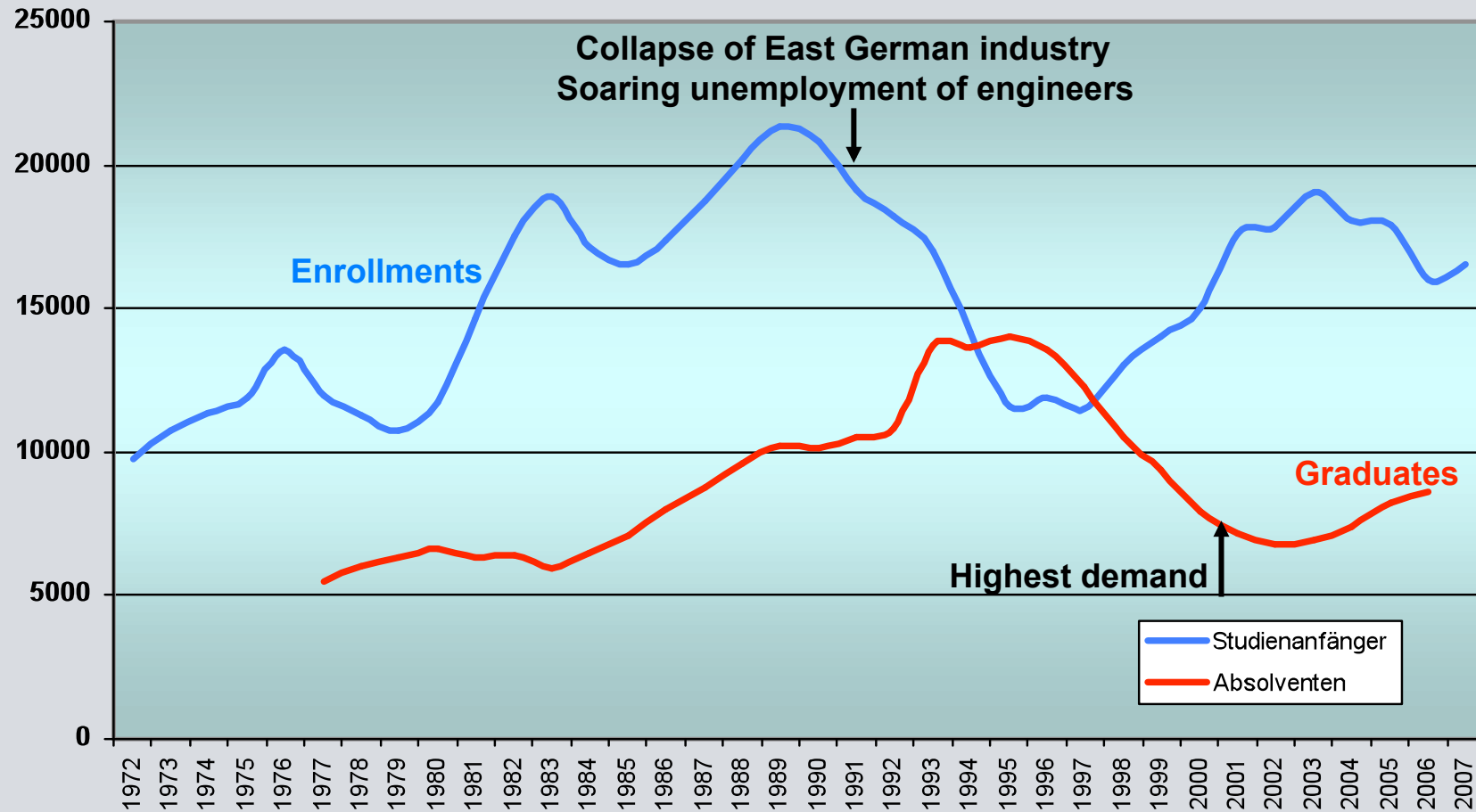
- **Hiring patterns, market cycles and enrollments**
- **How rationally do young people act when deciding about careers in science & technology (S&T)?**
- **How does society recognize and reward technical achievement?**
- **Beyond logic: The role of the media, visibility, image**
- **More “preaching to the converted” – a promising approach?  
What else could and should be done?**
- **Report on a current NaBaTech survey in Germany to determine young people’s perception of science**

**Companies' hiring patterns parallel market fluctuations**



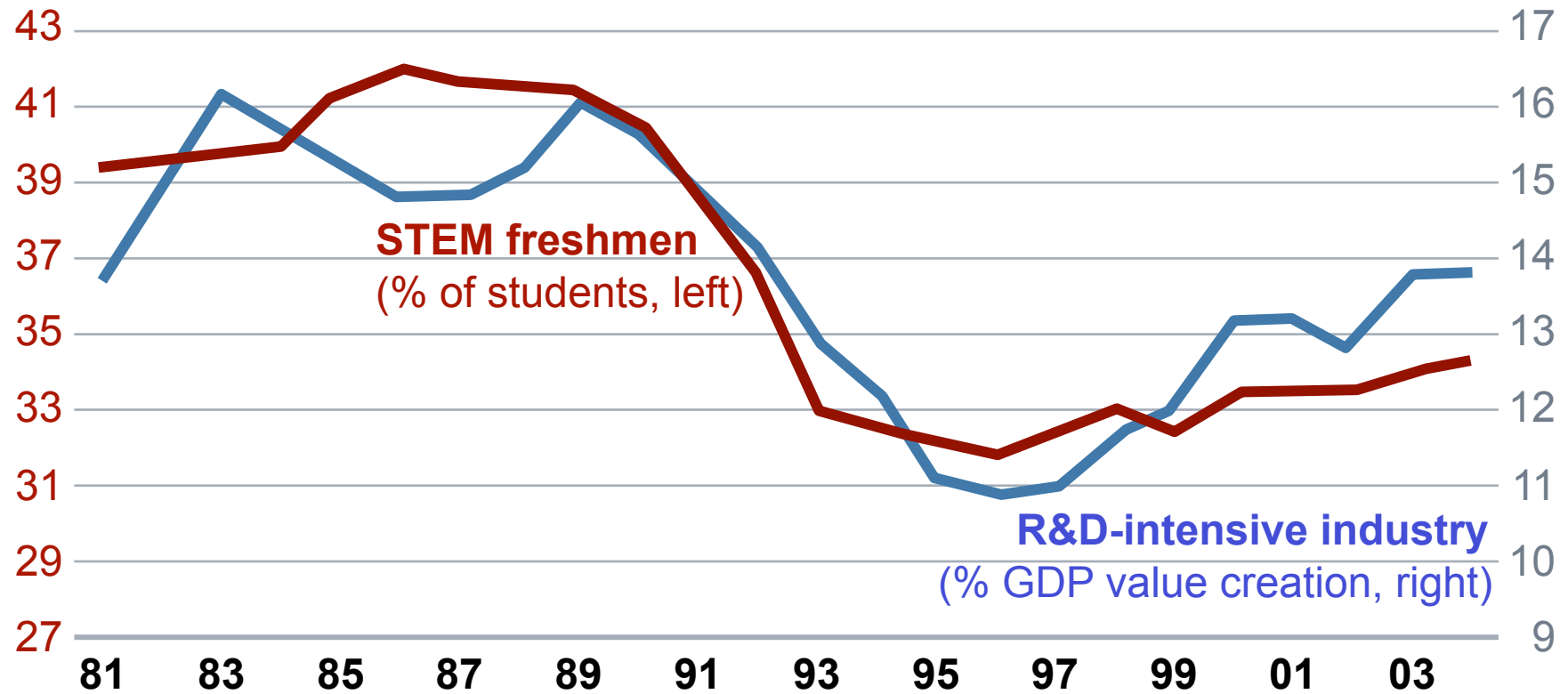
**Hiring (university graduates, S&T majors) parallels the market. Predictions mostly wrong!**

# Enrollments and graduates in electrical engineering / IT in Germany – A fatal phase shift



Source: German Statistical Office, 11/2007

# The choice of majors among freshmen parallels the value creation rate in Germany



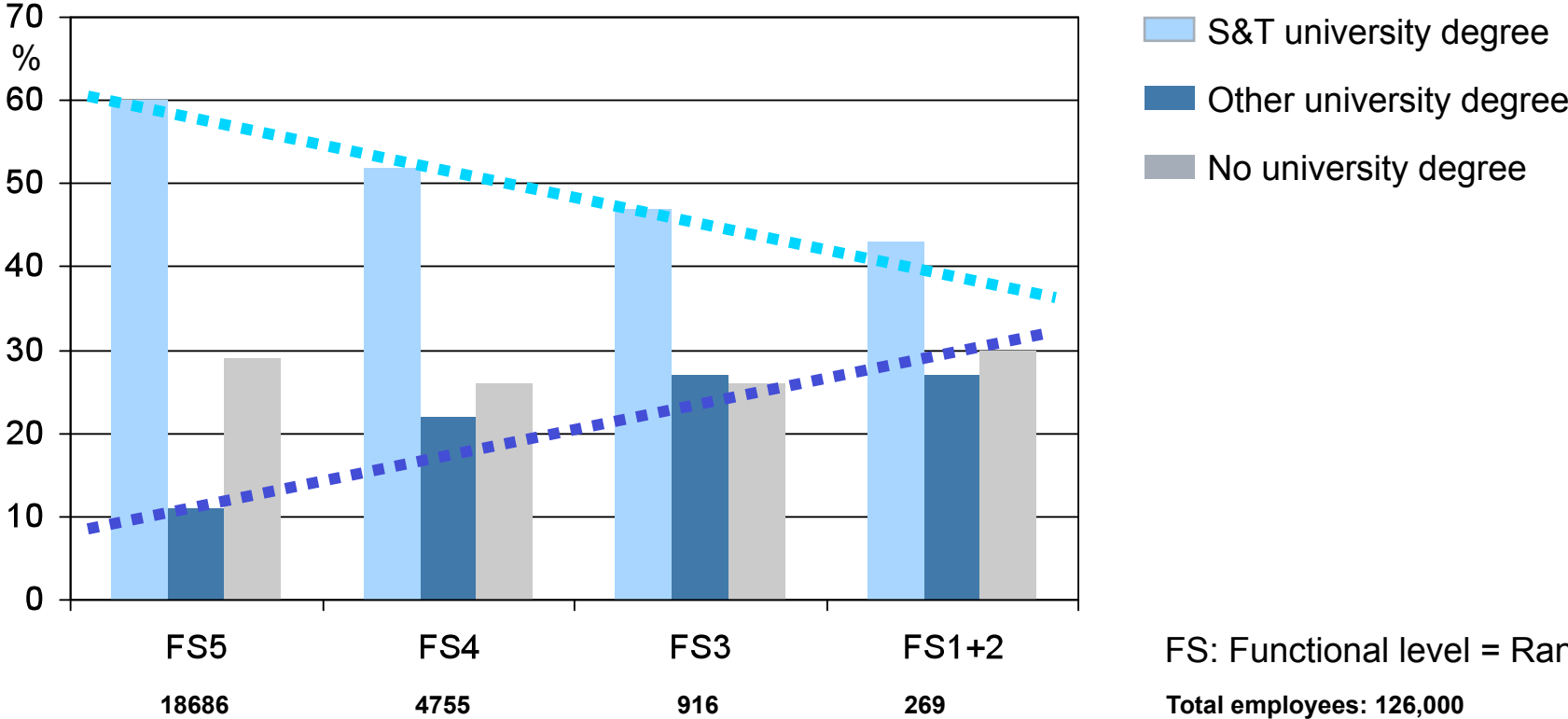
Source BMWI, DB Research, Destatis, OECD, 2008; DB Report: Zwischen zyklischem Engpass und Strukturwandel, July 16, 2008

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## Statement 1

- ***Oversupplies (as in 1994-97, 2002-03) and shortages of engineers depend on market fluctuations, which in turn determine hiring in industry.***
- ***Predictions of an engineer shortage in 1986-88 triggered increased enrollments, but were followed by a sharp economic downturn which left several age groups of graduates jobless.***
- ***The shock to these security-oriented groups was profound and shattered their confidence. Older engineers remained jobless.***
- ***S&T enrollments parallel R&D-intensive industries, whose importance has recently increased in Germany – against the general trend.***

# Educational background of Siemens managers – Good career options with an S&T degree – but better ones with a non-S&T degree!



Siemens Germany, employees above the general pay scale, Status 8/2008



## Different yardsticks in society for rewarding intellectual creativity

### Texts and music

To register: easy, cost-free  
(in Germany VG Wort, GEMA)  
To maintain rights: free of charge  
Fees collected up to 70 years after death of author.  
GEMA: actively protecting authors rights and collecting royalties

### Technical inventions

To get a patent: expensive, difficult  
To maintain rights: rising costs!!!  
Maximum duration: ca. 20 years after patent granted, royalties only if used  
Patent Office: No action taken to support inventors

- *Who got famous and made the millions - the inventor of the CD or pop stars like Madonna, The Rolling Stones, Amy Winehouse?*
- *Who could veto the modification of the Munich Olympic stadium 30 years after the games - the civil engineer who constructed it or the architect?*

## Scientists and engineers lack a positive image in society

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*So you're a rocket scientist? That don't  
impress me much.*

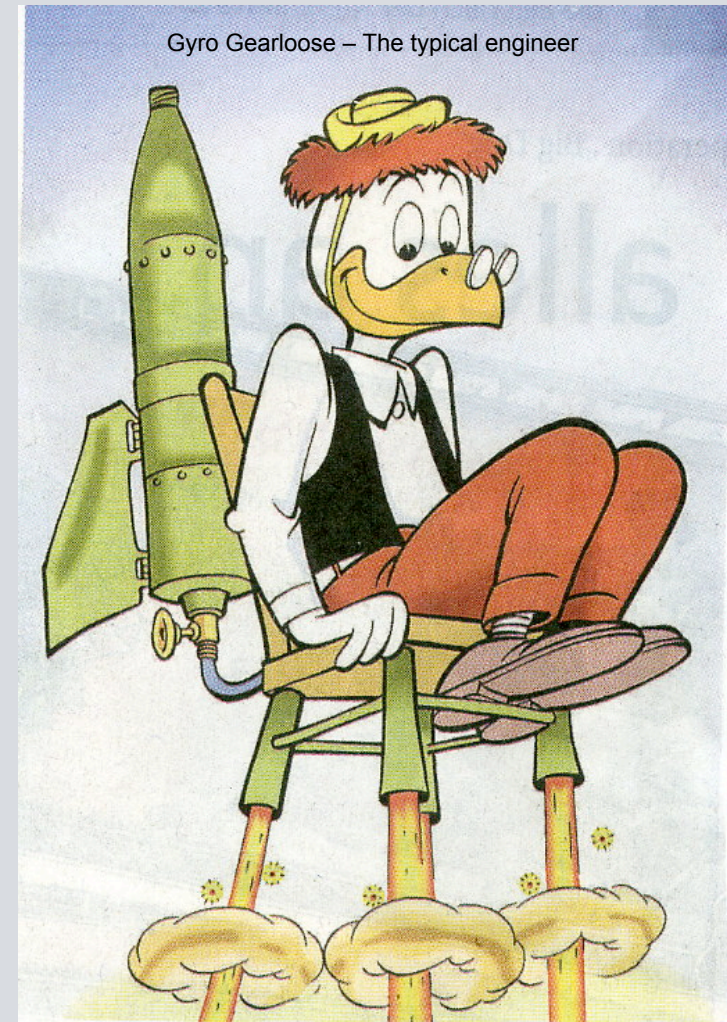
*So you've got the brains but haven't got the  
touch!*

*Don't get me wrong, I think you're all right*

*But that won't keep me warm in the middle  
of the night...*



**Shania Twain in her song  
"That don't impress me much"**



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## Voices from other countries – “A shortage would push up salaries”

- **The President of the Danish Technical University (DTU), Lars Pallesen, called the shortage of engineers “a fake,” because if it were true, the “salaries of Danish engineers would be higher.”**  
(April 19, 2007)
- **Michael S. Teitelbaum of the Sloane Foundation in his article “Do we need more scientists?” (Fall 2003) questioned the lack of scientists and argued that past predictions of looming shortages had only led to a growing surplus in the next economic downturn.**
- **He stated that “some senior scientists stress that no one should pursue a science career to get rich, which is a point well taken. Yet it would be unwise simply to ignore how alternative career paths compare in strictly economic terms.”**
- **The U.S., however, can compensate for the lack of financial reward in S&T by “importing” scientists (55% of PhDs in engineering).**

## Statement 2

- ***S&T has lost the reputation of being a guarantor of solid, albeit uninspiring careers; no seniority bonus for “best agers”***
- ***Who knows someone really successful just as an engineer?***
- ***What attracts more buyers: 5,000 tickets winning €1,000 each or the €5 million jackpot?***
- ***S&T does not figure at all in the media, especially in those addressing young women. Where they do, it’s mostly with a negative connotation.***
- ***Society poorly rewards technical creativity.***
- ***Technology is present everywhere, so it’s taken for granted.***

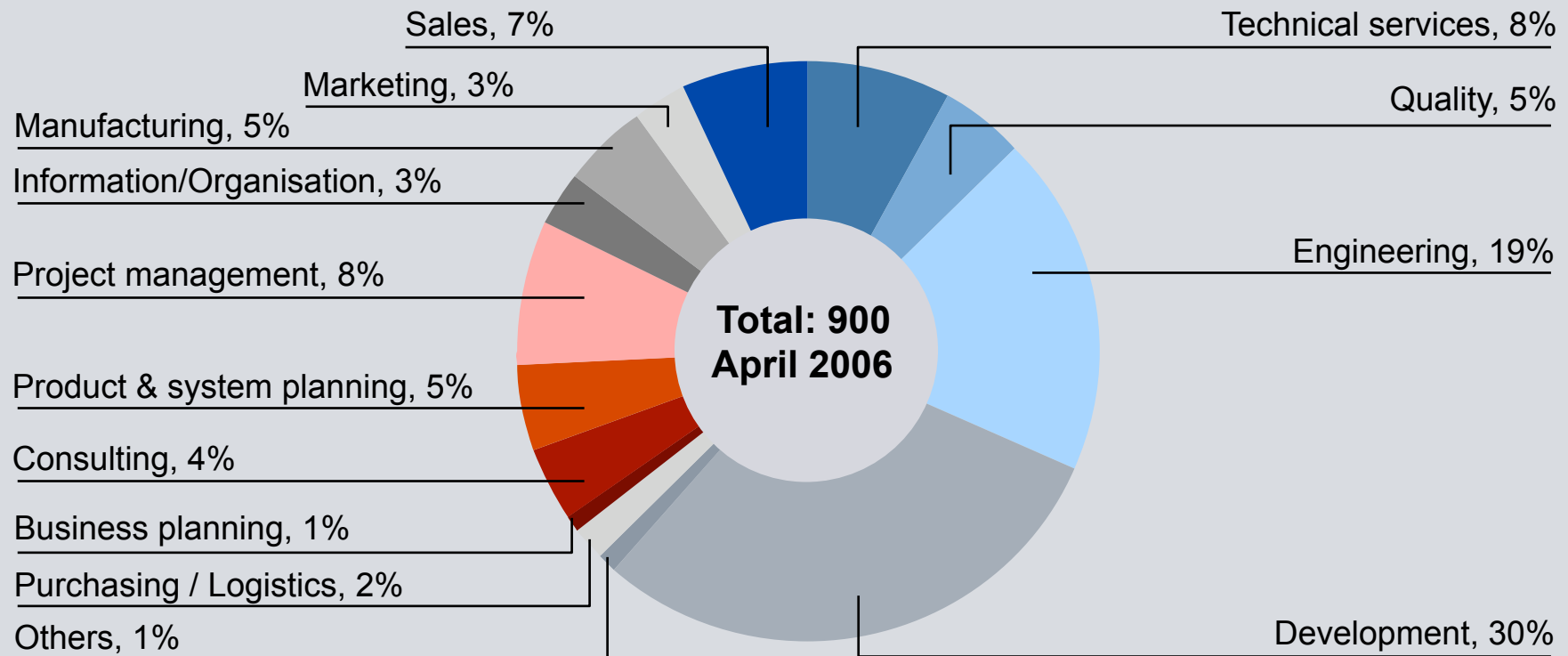
**Conclusion – Let's take the objections seriously.  
Let's improve instead of preaching how good it is!**

- ***Foster interest in science starting in kindergarten, make it interesting in schools and universities as well***
- ***Address multi-talented youngsters by highlighting the many job opportunities of S&T graduates***
- *Improve technical careers at companies (e.g. Siemens experts)*
- *Improve the position of inventors, e.g. by re-establishing tax breaks (abolished in Germany many years ago)*
- *Promote S&T topics in general media (like the EuroWisdom project)*
- *Create a Jules Verne Award for technical fiction / novels / scripts*

*And above all:*

- *Find out what young people really think about S&T careers!*

# Siemens Germany, job vacancies for engineers – A wide range of entry positions



**And there are many more options  
once you're inside the company!**

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## NaBaTech monitoring 2008 in Germany – Broad database on the S&T image

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**Problem: A lot of assumptions and opinions, but few reliable data about people's motivation and self-perception regarding S&T**

**Solution: A broad survey conducted by the University of Stuttgart, supported by the German Federal Government, VDI and acatech.**

- Survey carried out online or in written form by November 2008, results available in the spring of 2009
- Target groups: 3,000 school students, 2,000 university students, 2,000 S&T employees, 300 S&T self-employed, 300 S&T jobless, 200 teachers etc.
- Extensive questionnaire, developed in cooperation with NaBaTech advisory council (12 members, including myself)
- More information: [http://www.dialogik-expert.de/en/forschung/projektverbund\\_zukunft.htm](http://www.dialogik-expert.de/en/forschung/projektverbund_zukunft.htm)



**My final conclusion –  
Don't call young people blind or lazy ...**

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**...let's just make S&T careers more attractive!**

Thank you for your attention!  
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