

Lund University
Faculty of Engineering, LTH

ANNUAL REPORT 2005



Annual Report 2005

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In the Global Market



Swedish engineers are regarded as being competent and competitive, both nationally and internationally, according to a survey carried out in 2005 by the National Agency for Higher Education. However, the general working conditions of teachers need to be improved. In the report, LTH is praised for its pedagogical development and the internationalisation of its engineering programmes. The agency also points out that LTH is working hard on quality issues, and that the programmes have a well thought-out structure and have every chance of reaching their goals. However, contact and collaboration with industry could be improved. Steps have already been taken in this regard in the new organisation which was introduced in 2006.

During the course of 2005, it became even clearer that LTH is an actor in a highly competitive global education market. Continuously changing interest in different fields of engineering places considerable demands on the choice of programmes offered by LTH and adaptation to changing numbers of students in each programme.

The campus in Helsingborg is also engaged in developing programmes in which support is required from LTH. This means that programme planning must be very flexible in order to meet the demands of both students and society. We are ready to meet these demands. Apart from changing interests among Swedish students, interest in studying at LTH among foreign students is also growing, and with it the need for more teaching in English.

Research at LTH is characterised by several key subjects, which not only support undergraduate teaching, but also society's need for qualified research scientists in various areas. We believe that research on a broad front is necessary for both undergraduate and postgraduate teaching. LTH's strength lies in its diversity. During the year, LTH has been successful in gaining a large number of research contracts in key areas of research. While this creates greater opportunities for these research groups, it also increases the risk of diminished resources for other groups for varying periods of time. LTH must thus help finance internationally renowned research groups at LTH, and this has led to the resumption of discussions on new ways of allocating funds from the government appropriation for research and postgraduate education.

Together with Lund University, LTH has chosen three research groups from LTH to compete in 2007 for the so-called Linné grants*, which will be made available through the Swedish Research Council. LTH intends to apply for these grants again in two years, and hopefully we will have then identified other competitive research groups at LTH.

LTH has the advantage of being part of Lund University, and it is therefore easier for us to establish inter-faculty research than for independent institutes of technology. There is a need for research involving modern technology, medicine and science – often in an environment including the humanities and social sciences. Lund University offers excellent opportunities for this kind of interdisciplinary collaboration.

LTH's new organisation, which was developed during 2005, provides means for rationalisation in departments through the introduction of common administrative functions and operational organisation, as well as cooperation between services at various levels within LTH. Furthermore, it will now be easier to make the necessary changes at departmental and faculty level.

The need for flexibility is underlined by the fact that 69% of LTH's research and commissions is financed by external sources.

Apart from teaching and research, LTH has the task of interacting with society in general. This is important for LTH's future development and competitiveness. Contact with LTH's alumni has therefore been improved during the course of 2005. We are firmly convinced that LTH is ready to meet the challenges of the future.

Professor Gunilla Jönson
Dean of LTH

**To celebrate the 300th anniversary of the birth of the Swedish scientist, Carl von Linné.*

Undergraduate Studies

During 2005, more degrees than ever were awarded at LTH. Over 1100 students obtained degrees, of which 850 were Master's degrees in engineering, or architecture. This transient increase in the number of degrees is due in part to the completion of programmes in electrical engineering and chemical engineering by the large intake 4-5 years ago. The reverse will shortly be observed in Bachelor's degrees due to the low numbers of students enrolled three years ago. The number of International 1-year Master's degrees awarded to foreign students was just over 50. We are pleased to report that these programmes attract many applicants and that the success rate is high.

The total volume of students decreased somewhat, but their performance improved. During the coming years, LTH will have the capacity for new ventures in undergraduate and Master's programmes.

The number of eligible, first-choice applicants fell somewhat, but this decline was mainly restricted to one programme. Otherwise, the number of applicants to other programmes, such as IT, rose. This was especially gratifying, bearing in mind the needs of the labour market. The number of women enrolled continues to follow the national trend, showing a slight decrease over recent years.

The year was characterised by the government bill, "A New World – A New University", which was presented in June 2005. The intention of this bill is to include Swedish education in the Bologna process. From LTH's point of view the bill was a disappointment, as it was not proposed to extend Master's programmes in engineering and architecture to five years. Upon the initiative of LTH, the Swedish technical universities lobbied the government and parliament to underline the importance of upholding the value of these degrees, both nationally and internationally. Our efforts were rewarded by the positive decision of parliament at the beginning of 2006.

In November 2005 we received representatives from The National Agency for Higher Education, as part of their evaluation of Engineering Master's programmes at LTH. Over a hundred teachers, students and other employees were involved in the visit.

Implementation of the Bologna process, in the form of a new Act and Ordinance for Higher Education, will require a great deal of work on all programmes at LTH. Apart from the fact that the programmes in Industrial Design and Higher Technical Vocational Education will have to be changed, as these qualifications will disappear, all the courses and curricula will have to be refashioned during 2006.

Professor Per Warfvinge
Assistant Dean for Education

Student Intake

Number of full-time student equivalents (FTE), annual performance equivalents (APE) and degrees awarded (DEG) in 2004 and 2005 (calendar years)

	2004	2004	2004	2004	2005	2005	2005	2005
	FTE	APE	APE /FTE	DEG	FTE	APE	APE /FTE	DEG
Master of Science Programmes								
Biotechnology	213	181	0.85		258	225	0.87	5
Computer Science	500	441	0.88	116	447	381	0.85	93
Environmental Engineering	224	199	0.89	24	223	191	0.86	38
Electrical Engineering	528	419	0.79	128	395	376	0.95	134
Industrial Management & Engineering	342	273	0.80	32	392	335	0.85	51
Information and Communication Eng.	148	120	0.81		163	137	0.84	6
Chemical Engineering	334	289	0.87	85	239	237	0.99	102
Surveying	166	170	1.02	27	186	172	0.92	37
Mechanical Engineering	721	625	0.87	115	743	630	0.85	117
Risk Management	85	84	0.99	27	73	59	0.81	34
Engineering Physics	444	367	0.83	75	409	353	0.86	90
Engineering Mathematics	104	76	0.73		122	96	0.79	1
Engineering Nanoscience	63	39	0.62		113	97	0.86	
Civil Engineering	486	400	0.82	55	461	397	0.86	77
Other				1				1
Total for MScs in Engineering	4358	3683	0.85	685	4224	3686	0.87	786
Architecture	289	278	0.96	48	274	237	0.87	42
Fire Safety Engineering	157	146	0.93	41	157	145	0.92	45
Industrial Design	134	117	0.87	12	136	119	0.88	17
Bachelor's Programmes								
Biotechnology	54	56	1.04	14	28	32	1.14	12
Civil Engineering	131	102	0.78	6	146	132	0.90	25
Computer Science	62	45	0.73	8	54	49	0.91	14
Electrical Engineering	40	37	0.93	8	22	27	1.23	21
Geomatics	3.5	3	0.86		1.25	1.3	1.04	
Chemical Engineering	18	19	1.06	5	12	15	1.25	11
Multimedia Engineering	87	95	1.09	17	60	58	0.97	20
Production Engineering	7.6	7.8	1.03		2	3.3	1.65	5
Software Engineering	36	40	1.11	13	18	23	1.28	11
Total for BScs	439	405	0.92	71	343	341	0.99	119
International Masters Programmes	121	92	0.76	9	122	103	0.84	53
Continuation courses for BSc graduates	0.5	1	2	4	0.58	0.45	0.78	5
Vocational Food Technology	66	48	0.73	22	64.3	87.5	1.36	47
Foundation Year	70	55	0.79		69.5	61	0.88	
Separate course modules etc.	474	373	0.79		403	321	0.80	

External Communication

A number of new projects have been undertaken during the year. We are in the process of formulating a media strategy and developing our contacts with the press, as well as means of publicising the research carried out at LTH. A new visual identity for LTH was adopted and will be implemented in April 2006. We have also introduced a new publication tool, and adaptation to Lund University's new web style.

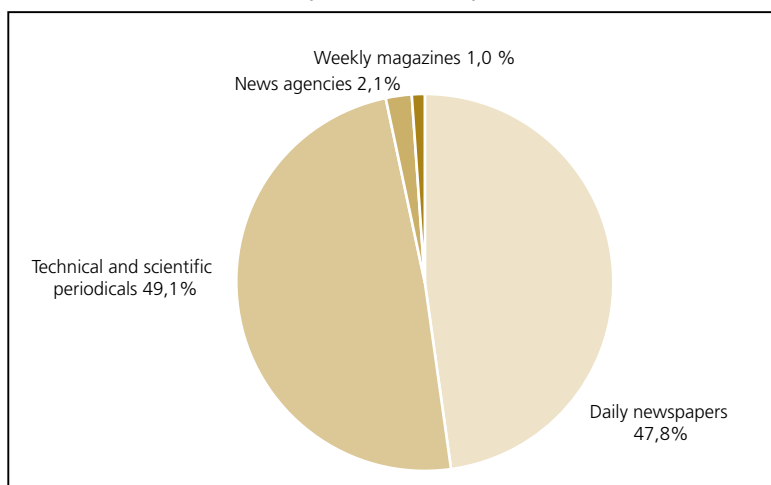
Press and media

According to Observer's media monitoring service, 1,131 articles in which LTH was mentioned were published in Sweden between 5 January 2005 and 6 January 2006. Articles on "researchers in Lund", "research at Lund University", or at individual departments are not included. As in previous years, the articles are evenly distributed between daily papers (527) and technical and scientific periodicals (571).

The number of publications containing articles on LTH is large: 215 daily newspapers, 383 technical and scientific periodicals, 15 news agencies and similar organisations, and 11 weekly magazines. LTH is often mentioned in the daily papers *Sydsvenskan* (188) and *Skånska Dagbladet* (86), and in periodicals such as *Arkitekten* (33), *Ny Teknik* (32) and *Bygg & Teknik* (21). Apart from printed articles, daily searches by Magenta News, a north-European electronic media monitoring company, show that news from LTH is often published on the Internet, which is not included in the statistics provided by Observer.

LTH's own magazine, *LTH-Nytt*, will in the future be published once each semester instead of twice. This decision was taken to give the editor greater opportunity to present LTH in the Lund University magazine, *LUM*.

Total number of articles. 1 January 2005–31 January 2006



Student Recruitment

Recruiting of students starts at an early age, when it is important to awaken an interest in science and technology, and continues at higher secondary level, when pupils are deciding which subjects they want to study. Some of our activities are directed towards specific groups, such as girls. Together with Lund University, we are also working on recruitment on a broad front. A plan of action was adopted by the University's Vice-chancellor for broader recruiting in January 2006.

This year's intake of students came from about 240 different schools throughout Sweden; 57% from the southern region of Skåne. The recruitment projects and measures undertaken during the year are briefly described below.

Awakening interest...

- The Discovery Club and the Research Club – These were established together with the Faculty of Science about 10 years ago. The clubs are administered by Folkuniversitetet, and run by the Faculty of Science.
- The Fifth Grade Project – This is run by undergraduate and postgraduate students in chemical engineering and biotechnology. They visit schools and give shows for 5th-year pupils.
- Teknikåttan (a nationwide competition in technology for 8th graders) – 375 classes (about 7800 pupils) from Skåne competed in Teknikåttan in 2005. Sixteen classes from Skåne and the neighbouring regions of Småland and Blekinge visited LTH for the day. The regional final was held in collaboration with the paper-manufacturing company Stora Enso, in Bromölla.
- Lustfyllt lärande (fun in learning) – This project is directed towards teachers of grades 7-9.
- Teknikens dag – This provides an opportunity for all to try out technology.

Special groups...

- Flickor på teknis – 150 girls from upper secondary schools in southern Sweden visited LTH for a few days.
- LTH-tjejer informerar – Female students at LTH gave information to girls in their final year of compulsory education and at upper secondary level.
- Faculty Ambassadors – LTH has joined this project, which is directed towards groups not normally going on to university studies. The project was started by students studying law at Lund University.
- The Gemstone Project – This project is directed towards gifted students in upper secondary education, especially those in science and engineering, throughout the country.

Other activities...

- Science and Engineering Days – About 4000 pupils and 200 teachers from upper secondary schools in southern Sweden attended talks given by representatives from LTH and the Faculty of Science during a week in March.
- The Innovation Project – This is run by chemical engineering and biotechnology students at LTH and is directed towards third-year students in upper secondary schools. The basic idea is that groups of 2 or 3 students carry out a project which is intended to give them some idea of the kind of tasks an engineer faces.
- Study advisors and careers counsellors – About 80 study advisors and careers counsellors from upper secondary schools and Komvux visited LTH in October in order to learn what it is like to study at LTH and the kind of careers open to engineers.
- LTH opened its doors to the public for a day in October and a day in March.
- Advertisements – in daily papers and magazines.
- The LTH Prospectus – 45,000 copies were distributed to all third-year upper secondary school students studying science and technology, all schools throughout Sweden, students and employees of LTH, alumni, companies, etc.
- Exhibitions and school visits – LTH has participated in 60 exhibitions and visits to schools.
- A mini-tour – A mini-tour of the Stockholm area was carried out.
- Last-Minute Campaign – This took place at Sturup Airport in April.

Where do our students come from 2005 ?

	Skåne	Gothenburg	Stockholm	Central Sweden
Lund total	57%	7%	9%	10%
Hbg totalt	67%	5%	5%	8%
Electrical Engineering	75%	1%	3%	3%
Computer Science	73%	3%	6%	2%
InfoCom	69%	3%	13%	3%
Engineering Physics	61%	5%	8%	8%
Chemical Engineering	59%	0%	11%	17%
Architecture	58%	6%	10%	10%
Biotechnology	56%	13%	6%	7%
Nanoscience	55%	2%	9%	13%
Industrial Management & Engineering	52%	10%	12%	8%
Industrial Design	48%	10%	16%	8%
Surveying	40%	17%	8%	15%
Fire Safety Engineering	31%	16%	13%	13%*
Computer Science (Hbg)	83%	3%	0%	3%
Civil & Traffic Engineering	70%	20%	0%	10%
Civil Engineering & Architecture	67%	4%	4%	6%
Civil Engineering & Railroads	29%	14%	14%	29%
Foundation year	61%	2%	10%	10%

*16% northern Sweden

Source of information leading to choice of LTH

	2005	2004
LTH prospectus	22%	19%
Friends	21%	22%
The Internet	18%	14%
Family	15%	14%
Visited LTH	14%	12%
VHS* Directory	10%	10%
LTH students	7%	7%
School teachers	3%	2%
School careers advisor	2%	2%

*VHS = National Agency for Higher Education

Reasons for choosing LTH

	Close to home	Good reputation	City of Lund
1995	54%	26%	39%
1996	48%	37%	27%
1997	37%	34%	47%
1998	41%	53%	65%
1999	40%	54%	65%
2000	40%	58%	67%
2001	37%	65%	72%
2002	35%	67%	68%
2003	40%	70%	68%
2004	39%	67%	68%
2005	37%	67%	68%

Source of information leading to choice of programme

	Prospectus	Friends	The Internet	Family	Visited LTH
LTH total	22%	21%	18%	15%	14%
Hbg total	21%	18%	17%	14%	6%
Surveying	42%	15%	15%	6%	13%
Environmental Engineering	38%	19%	19%	10%	6%
Nanoscience	30%	7%	24%	9%	17%
Chemical Engineering	28%	3%	19%	6%	19%
Civil Engineering	26%	27%	4%	14%	12%
Biotechnology	24%	15%	22%	16%	11%
Engineering Mathematics	23%	19%	35%	9%	14%
Fire Safety Engineering	22%	4%	56%	9%	0%
Engineering Physics	20%	21%	14%	19%	16%
Electrical Engineering	20%	26%	12%	17%	26%
Industrial Management & Engineering	19%	36%	18%	18%	10%
InfoCom	19%	28%	34%	22%	6%
Computer Science	17%	13%	15%	22%	19%
Industrial Design	16%	12%	28%	12%	32%
Mechanical Engineering	16%	32%	13%	17%	16%
Architecture	12%	28%	10%	8%	14%
Civil & Traffic Engineering	50%	10%	20%	0%	10%
Civil Engineering & Architecture	18%	25%	20%	14%	4%
Computer Science (Hbg)	17%	14%	11%	17%	9%
Civil Engineering & Railroads	14%	15%	15%	6%	13%
Foundation year	21%	17%	14%	14%	5%

Proportion of women admitted (%)

	2005	2004	2003
MSc programmes	22	25	28
BSc programmes	15	14	29
Architecture	55	66	54
Fire Safety Engineering	29	28	17
Industrial Design	50	47	58
1-year International Master's Programmes	30	28	28

International Student Exchange

The aim set out in LTH's internationalisation policy is that most students should spend a period studying abroad. A great deal of effort has been devoted to increasing the number of LTH students studying abroad in the form of a European Day, and through information given during lectures, lunch breaks and in the evening, in collaboration with the Students' Union at LTH. The apparent increase in the number of students studying abroad is due to the fact that since the autumn semester of 2005 information on those carrying out their Master's projects in other countries is available.

The number of trainee stipends available through the WITEC programme – Women in Technology – increased in 2005. Female students studying architecture and industrial design made good use of these opportunities to gain working experience. Many students also took the chance to carry out their Master's projects within the framework of MFS (Minor Field Studies), which provides stipends from SIDA (the Swedish International Development Cooperation Agency).

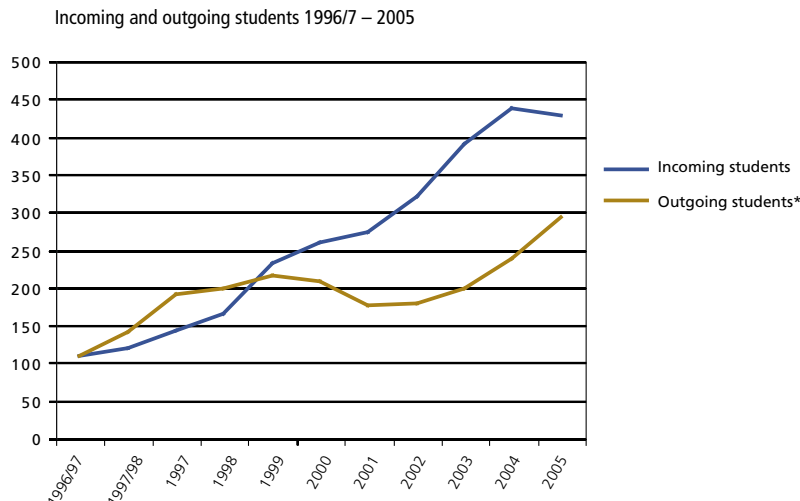
LTH has an agreement with CALTECH in the USA, and sends students there to take part in their SURF programme. During the summer of 2005, four LTH students were given this unique opportunity.

A large number of students took part in attractive exchange programmes in the USA, and the number of American students coming to LTH also increased, although the number of students coming through university agreements decreased. More students chose to study in Asia, although Europe is still the most popular destination.

Students coming to LTH from abroad originate mostly from Europe, mainly Germany, France and Spain.

The balance between incoming and outgoing students has improved during 2005 as LTH has been more restrictive in accepting foreign students and has increased efforts to send its own students abroad.

The three International Master's Programmes that started in 2002: Bio- & Food Technology, System on Chip and Water Resources, further strengthened their positions. The success rate of these programmes is very good. A number of social activities were arranged in all three programmes, including a Chinese party and an African party, where students from these parts of the world got together and introduced their home countries to other students and teachers. These social gatherings were much appreciated. Their year of studies was concluded with a graduation ceremony in the University Building on December 13th, Lucia Day in Sweden. The Lucia procession of white-clad girls singing and bearing candles was much appreciated.



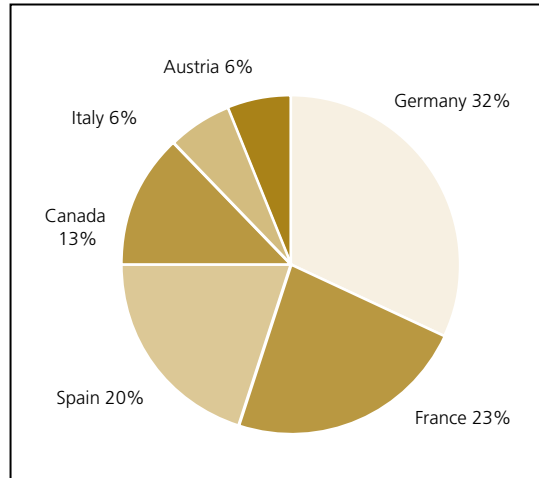
*The considerable increase in the number of students studying abroad is due to the fact that since the autumn semester of 2005 information on those carrying out their Master's projects in other countries is available.

International Collaboration

Foreign students studying at LTH

	2005	2004
Europe	330	317
North America	54	63
Scandinavia	13	25
Asia	10	5
Australia & New Zealand	11	17
South America	8	9
Total	426	436

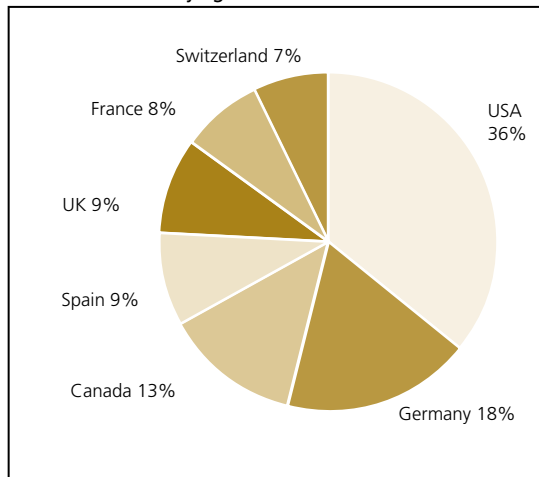
Foreign students studying at LTH



LTH students studying abroad

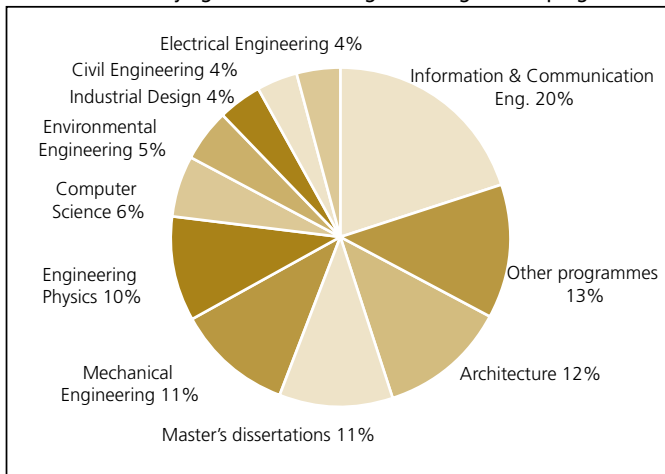
	2005	2004
Europe	107	116
North America	82	76
Asia	29	11
Scandinavia	18	17
Australia & New Zealand	8	11
South America	6	6
Other countries	42*	-
Total	292	237

LTH students studying abroad



*From the autumn semester of 2005 information on Master's dissertations completed abroad is recorded, but not for each country separately.

LTH students studying abroad according to undergraduate programme



Statistics based on LADOK (the National Student Records Database) and not full-time equivalents

Postgraduate Studies

A large number of doctorates, in fact the largest ever, were awarded at LTH during 2005. However, the difficult financial situation in which many departments find themselves, often requiring various measures of economy, has led to a significant decrease in the recruitment of postgraduate students and an increase in industrial postgraduates, as was the case in 2004. Although the reduction in postgraduate admissions at LTH (down by 30%) follows the general national trend, this is a serious problem and will have to be addressed in the coming years.

The number of postgraduates with correct, updated study plans has increased during the year, but there are still a number of students for whom this compulsory instrument appears not to be working satisfactorily. Work is in progress to remedy this situation.

During 2005, researchers at LTH had several opportunities to take a course in postgraduate student supervision, qualifying them as supervisors, as an alternative to the central course arranged by Lund University. The course takes two days and has been planned in close consultation with the University. By the end of the year, about 200 researchers had taken the course. More senior supervisors helped the younger ones, while at the same time refreshing and revising their knowledge on new regulations associated with postgraduate studies.

The lack of an adequate introduction to postgraduate studies, previously identified, has been remedied by continued, regular, short introductory meetings with newly admitted students. The aim of these meetings is to help postgraduate students get off to a good start, and meetings in English are planned for next year, for students not yet able to speak or understand Swedish.

During 2005 the National Agency for Higher Education conducted a national evaluation of postgraduate studies in engineering through self-evaluation and a visit in the autumn, during which the evaluation group met members of the faculty management and representatives from various research areas at LTH. The results of the evaluation are expected to be published during the spring of 2006.

In connection with the annual theme day on postgraduate studies, the merits of such an education, both inside and outside academia, were discussed. Postgraduate students and supervisors, as well as external representatives from research institutes and industry, took part, and contributed to an interesting discussion on the various aspects of postgraduate education and employability.

Professor Klas Malmqvist
Deputy Dean

Postgraduate students 2005–2000

	2005	2004	2003	2002	2001	2000
Total number enrolled	86	107	167	139	167	171
Women (%)	34	33	30	27	35	32
PhDs awarded	135	127	114	95	81	69
Women (%)	24	28	29	33	26	33
Licentiates awarded	73	63	91	77	56	67
Women (%)	27	30	24	22	21	19

Research

Research at LTH has continued to develop in a positive direction during 2005. Lund University has a leading position in research in Sweden, and LTH plays a very important part in this. It is of great advantage to LTH to belong to the University with its broad spectrum of teaching and research, offering excellent opportunities for interdisciplinary and multi-disciplinary research; a necessity bearing in mind the current structure of research funding. This advantage is further strengthened by the fruitful collaboration with neighbouring universities on both sides of the Öresund. Many research groups and centres have enjoyed success, and research at LTH has attracted a great deal of interest.

As examples of LTH's success in research, a number of projects can be mentioned that have been declared excellent research environments, and are therefore assured of long-term financing. In December 2005, for example, The Foundation for Strategic Research decided on long-term support for 18 excellent research environments in Sweden. Five of these were at Lund University, four of which at LTH. This clearly illustrates the high scientific level of research at LTH. Vinnova (The Swedish Agency for Innovation Systems) has approved a centre of competence to be coordinated by LTH, "Next Generation Innovative Logistics" (NGIL), which means long-term financing of research in logistics in collaboration with industry.

The decision in 2005 to revoke the planned cut-backs in the financing of energy research, in which LTH has a strong tradition, was gratifying. The Swedish Energy Agency thus has roughly the same amount of funds as previously. This means that researchers behind the initiative for the new Energy Research Portal at LTH have reason to be optimistic about the future.

A number of projects are ongoing at LTH within the EU Framework Programme, some of which are coordinated by LTH. Despite a number of problems regarding contributions to overheads from EU-funded projects, EU funding constitutes a very important and increasing part of LTH's external financing for research. Apart from these projects, LTH has two large-scale facilities and several training sites for postgraduate students.

During the year, more teachers and researchers have been promoted to professors, which bears witness to the high academic level at LTH.

Professor Klas Malmqvist
Deputy Dean

EU-funded Research

During 2005, research groups at LTH participated in a total of 68 projects within the EU's Sixth Framework Programme, and is thus the most active faculty of Lund University within this programme. Contracts regarding a further 12 projects were negotiated at the end of 2005, and these projects are expected to start during the first half of 2006. The first table describes the distribution of projects within the programme, while the second presents the distribution according to type of project.

Four of the projects are coordinated by LTH. A good example is the recently started project, "Nanowire-based One-Dimensional Electronics" (NODE), an Integrated Project in the programme "Nanotechnology and nanosciences, knowledge-based multifunctional materials and new production processes and devices". NODE is coordinated by the Division of Solid State Physics at LTH. This is a four-year project, awarded €9.5 million by the EU Commission, in which several prominent international actors are participating, such as Philips, IBM Research, The Max Planck Society and The Delft University of Technology.

LTH has also participated in several European research projects outside the Framework Programme, such as the Asia Link and Asia Pro Eco programmes.

Distribution of projects within the programme

Programme	Number of projects	Coordinated by LTH
Aeronautics and space	4	-
Co-operative Research (CRAFT)	1	-
Food quality and safety	4	1
International co-operation (INCO)	1	-
Information society technologies	22	-
Life sciences, genomics and biotechnology for health	5	-
Marie Curie Actions	5	2
New and emerging science and technologies	3	-
Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices	11	1
Sustainable Development, Global Change and Ecosystems	12	-
Total	68	4

Distribution according to type of project

Type of project	Number of projects	Coordinated by LTH
Integrated Project	26	1
Network of Excellence	11	1
Specific Targeted Research Project	18	-
Coordination Action	5	-
Specific Support Action	2	-
Marie Curie Actions (Early Stage Training Site, Research Training Network, Individual Fellows)	5	2
CRAFT (SME dedicated)	1	-
Total	68	4

Contacts with Industry

Our collaboration with industry is influenced by the distinctive commercial structure in the vicinity of LTH, namely few but large companies, and few trade research institutes. We have very good contact with a number of sectors, and many companies understand that LTH's greatest contribution lies in knowledge transfer through Master's projects and employing students after graduation. Apart from this, some departments at LTH have fruitful R&D collaboration directly with several companies. The contribution to external revenue by private financing has increased somewhat in recent years, and this has largely had a positive effect on LTH, helping it to create a distinct image. It is important, however, to point out that a high degree of integrity is required on the part of researchers so that consultancy does not encroach upon research so as to change the direction of this research. We have also entered into discussions with a number of trade research institutes, for example, The National Testing and Research Institute in Borås, with a view to closer collaboration.

As part of our efforts to improve collaboration with SMEs in the region, an assistant dean for industrial liaison was appointed at the end of the year.

Another way in which we plan to improve industrial collaboration is by meeting important actors in Swedish commerce and industry in order to synchronize undergraduate programmes to the needs of industry. The ultimate aim of this is to improve the quality of our programmes and to make our graduates in engineering, architecture and industrial design more attractive to industry.

Professor Klas Malmqvist
Deputy Dean

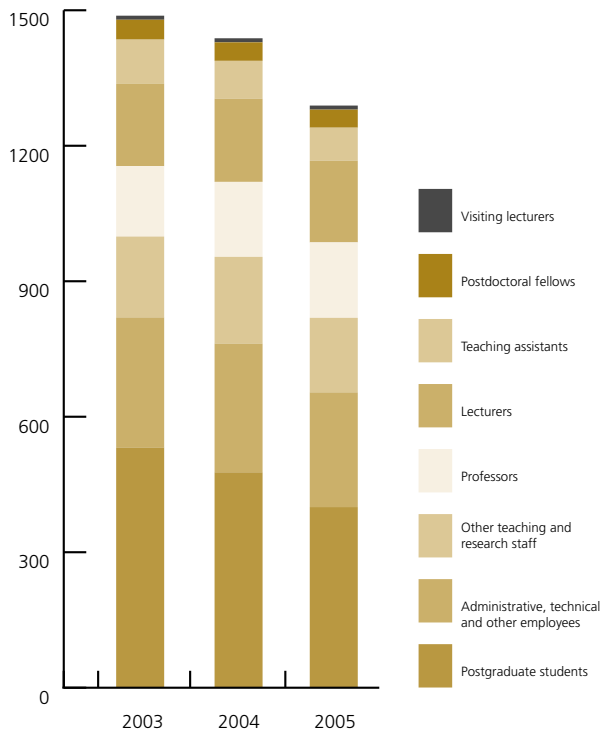
Income from private Swedish companies (SEK million)

	2005	2004	2003
Income	80	88	85
Change	-9%	4%	-12%

6% of LTH's total income for 2005 is derived from private Swedish companies.

Staff

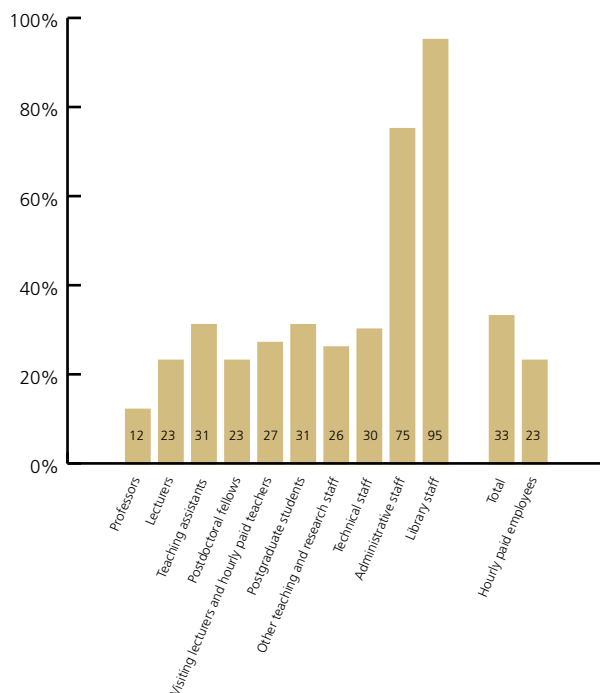
Personnel – Full-time equivalents



Personnel – Full-time equivalents

	2005	2004	2003
Postgraduate students	400	477	532
Administrative, technical and other employees	254	285	288
Other teaching and research staff	165	192	179
Professors	167	166	156
Lecturers	181	184	182
Teaching assistants	73	84	98
Postdoctoral fellows	40	41	44
Visiting lecturers	9	9	9
Total	1 289	1 438	1 488

Full-time equivalents showing proportion of women



Honorary Doctors

Professor Malin Falkenmark

Professor Malin Falkenmark was awarded an honorary doctorate for her tireless efforts to bridge the divide between hydrology and other areas of science, between theory and application, and between scientists and politicians. She has shown how the effects of water, or the lack of it, influence famine, the environment and international conflicts throughout the world. Through her meetings with politicians, environmentalists, engineers and scientists she has had considerable influence on policies affecting water. For several years, she was the executive secretary of the Swedish Committee for Unesco's International Hydrology Programme. During this period she made significant contributions to the establishment of hydrology as a scientific subject in Sweden, and helped water resources engineering at LTH to direct their studies towards hydrology. Together with Professor emeritus Gunnar Lindh, LTH, she wrote the first comprehensive textbook in Swedish on the subject of hydrology. She has given several lectures in the international courses arranged by the Division of Water Resources Engineering at LTH, and has been directly engaged in the supervision of PhD students. She holds a professorship at Uppsala University, and has received a number of prestigious awards.

Harald Skogman

Harald Skogman (Licentiate in Engineering), former MD of Novozymes Biopharma AB in Lund, is a well-known figure in Swedish biotechnology, and he has survived the ups and downs of the sector for several decades. In his scientific work and the management of various companies he has been part of the exciting development from basic fermentation technology to genetic engineering, which has caused much debate, and today's broad spectrum of applications. He started his career at SSA and Sorigona, and then went on to lead the companies AB Biotechnics, ABP, Multiferm and BioGaia Fermentation by heading a number of R&D projects. Apart from his achievements in industry, Harald Skogman has made important contributions to strengthening collaboration between biotech companies and the academic world, not least between his own companies and LTH. He is a much appreciated speaker, chairperson and motivator in many forums the aim of which is to develop biotechnology in Sweden and the Öresund Region. Thanks to his considerable experience, openness and optimism, he has played an important role in this development.

Boris Smeds

Boris Smeds (Licentiate in Engineering), who is head of division at the European Space Agency (ESA) in Darmstadt, was on the brink of gaining his PhD in ink-jet printing at the Department of Electrical Measurements at LTH twenty-nine years ago. His thesis defence was postponed as the examiner was prevented from coming. At the same time, Boris Smeds became involved with ESA and never got around to defending his thesis. Now he has been awarded an honorary doctorate instead, in the same year that the Cassini-Huygens mission was successful in landing on Saturn's moon Titan, the most distant landing in space history. It would probably not have been possible to obtain images of the landing if Boris Smeds had not intervened. He found a serious error which meant that the mother ship, Cassini, could not communicate with the lander, Huygens, due to the difference in the relative velocity of the two spacecraft. Huygen's receiver was unable to compensate for the frequency shift between the signal emitted by the probe and the one received by the orbiter, due to the Doppler shift. The problem was solved by changing Cassini's orbit around Saturn to a much higher altitude. Boris Smeds has also been involved in teaching at LTH, and has given seminars on space research. He sets a fine example for today's engineering students.

Grants and Prizes

The Foundation for Strategic Research, SSF, has located four of its 18 strategic research centres at LTH. They are: Professor Marcus Aldén and CECOST, The Centre for Combustion Science and Technology, who have also received financing from the Swedish Energy Agency, STEM; Professor Lars Samuelson and the Nanometer Consortium; Professor Carl Borrebaeck and CREATE Health – Clinical Cancer Research using Emerging Advanced Technology in Health; and Professor John B Anderson, Information Technology.

The Agrigas project at the Department of Biotechnology won Skåne's first Climate Prize.

EU's Leonardo da Vinci Prize was awarded to an educational programme for hospital physicists in which the Department of Electrical Measurements was involved.

The Foundation for Strategic Research granted Ingvar Scholarships, as "future directors of research", to three researchers at LTH: Dr Tomas Akenine-Möller, Professor Fredrik Höök and Dr Lars-Erik Wernersson.

"Nanowires for Fundamental Material Science and Quantum Physics and for Applications in Electronics, Photonics and in Life-sciences", headed by Professor Lars Samuelson, was declared an "excellent research environment" by the Swedish Research Council.

FORMAS – The Swedish Research Council for the Environment, Agricultural Sciences and Spatial Planning – granted stipends to a number of LTH researchers: Kerstin Barup, Inger Björck, Mats Bohgard, Jonas Brunskog, Helena Bülow-Hübe, Elisabeth Hornyánsky Dalholm, Per J Gustafsson, Kent Persson, Björn Johannesson, Björn Karlsson, Mattias Kärrholm, Bengt Martinsson, Annika Mårtensson, Katarina Nylund, Peter Rådström, Sven Thelandersson and Maria Wall.

The Foundation for Strategic Research granted funds to a "Bio-X" project in which Professor Gunnar Sparr, from the Department of Mathematics, is collaborating with Professor Dan E Nilsson, from the Department of Cell and Organism Biology.

The Swedish State Inheritance Fund granted SEK 4.5 million to Björn Breidegard, CERTEC, for the development of Minimetern, a technique that will help people with brain damage to communicate.

SAREC, the research department of SIDA (The Swedish International Development Cooperation Agency), is providing support for foreign projects being carried out by the Divisions of Water Resources Engineering, Architecture and Development studies, and Biotechnology.

Replisaurus Technologies, a company founded by LTH students Patrick Möller and Mikael Fredenberg, won the title of "Spin-Off Company of the Year in Sweden".

Dr Fredrik Sebelius, who is one of the founders of the company NovoSense, shared first prize for their product CardioSense, awarded by Venture Cup Syd.

Dr Karin Brunell-Freij, Traffic Planning and Engineering, won Sigge Thernwall's Prize of SEK 10,000.

Dr Jing Liu, Biotechnology, was awarded a stipend by the foundation set up to commemorate King Karl XVI Gustaf's 50th birthday.

Professor Carl Borrebaeck, Immunotechnology, was awarded a sizeable grant by the Leukemia & Lymphoma Society of the USA.

Dr Henrik Sandberg, Automatic Control, was awarded a prize by Hans Wertén's Foundation.

Professor Fredrik Höök, Solid State Physics, was awarded a Senior Research Position by the Swedish Research Council, a prestigious appointment guaranteeing funding of his research for the next 6 years.

Professors Bärbel Hahn-Hägerdal, Guido Zacchi and Gunnar Lidén have been granted EU financing for a project on the mass production of ethanol.

Dr Björn Regnell, Department of Communication Systems, won Lund University's pedagogical prize.

Professor emeritus Kåre Larsson, formerly from the Division of Food Technology, was awarded the Engeström Gold Medal by the Royal Physiographical Society.

The Axis Prize was awarded to Johan Windmark for his Master's project.

Albihn's Stipend was awarded to Ola Palm for his Master's project.

LTH student Marta Ahlqvist was awarded a Lions stipend for her Master's project on water purification in Bolivia.

A group of architecture students, Tanjung Satrio Buntaram, Carl Bonde, Yu Yuen Leow, Christopher Nolan and their teacher John Cramer, won a German architecture competition in the use of textiles.

(This list is not exhaustive.)

Finance

LTH's revenue for 2005 amounted to SEK 1,302 million. The revenue for 2004 was SEK 1,290 million after considerable adjustments of booked revenue. Excluding extraordinary items, LTH's revenue diminished between 2004 and 2005.

Of the revenue for 2005, about 32% originated from the government allocation for undergraduate teaching, while 20% was made up of the faculty appropriation for research and postgraduate teaching. Direct government grants thus account for just over half of the total revenue, the rest being derived from other sources of finance, also mainly government organisations.

About 34% of our total revenue arises from external research grants, while roughly 12% originates from commissions. Among the largest financial contributors to research are the Swedish Research Council (SEK 90 million), the EU (SEK 79 million) and Vinnova (SEK 54 million).

About a third (31%) of LTH's research and postgraduate teaching is financed by direct government grants, while 69% is financed by other sources. This places high demands on our ability to adapt research according to the priorities of these financiers.

LTH's expenses for 2005 were SEK 1,290 million. The greatest costs being those for personnel (59%), goods and services (19%), buildings (16%), and equipment (5%). The net interest earnings were SEK -1.3 million.

The net profit for 2005 was about SEK +10.5 million. The variation in profits and losses between various areas of LTH is, however, considerable. A number of departments have accumulated deficits over a number of years. This is associated with difficulties in adapting their research, on a short timescale, to changes in priority by financing bodies.

LTH's assets amount to SEK 522 million. The cash balance increased to SEK 269 million, while other assets, including the value of equipment, decreased. Among debts, loans and prepaid revenue from sources of research financing increased, while other items of debt decreased.

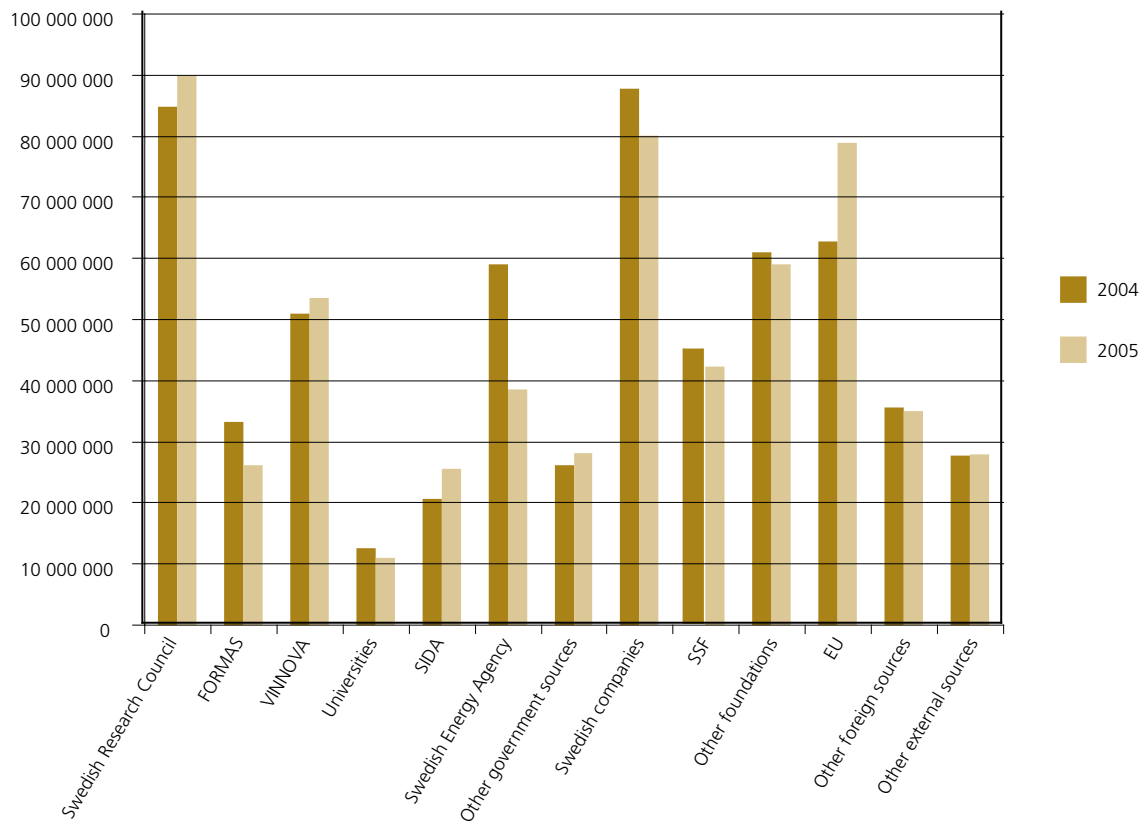
LTH's agency capital for 2005 amounted to approximately SEK 10 million (about SEK 0 million for 2004). The long-term aim is to attain an agency capital equivalent to about 10% of our total annual turn-over, i.e. about SEK 130 million.

Investments (SEK thousand)

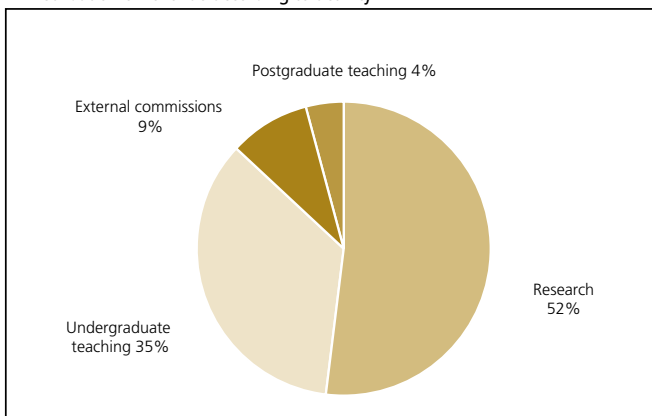
	2005	2004	2003
Undergraduate teaching			
Investments	5 563	5 475	11 585
Revenue*	458 718	451 808	442 188
Investment/revenue	1%	1%	3%
Research & postgraduate teaching			
Investments	38 909	32 063	48 363
Revenue*	724 102	735 481	788 341
Investment/revenue	5%	4%	6%
Commissions			
Investments	1 732	3 191	1 724
Revenue*	118 299	105 099	103 769
Investment/revenue	1%	3%	2%

*Revenue excluding transfers.

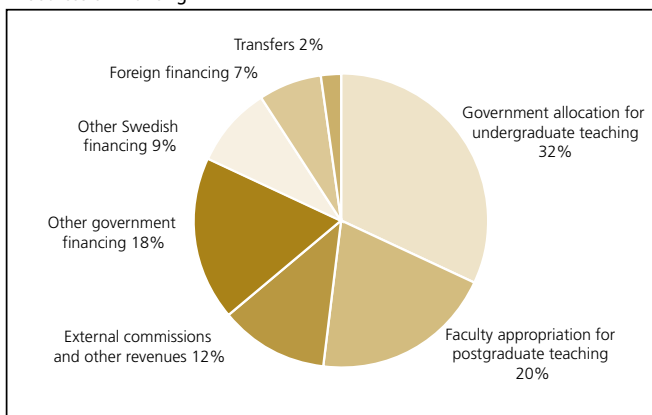
Income from external sources of financing



Distribution of revenue according to activity



Sources of financing



Profit and loss statement (SEK thousand)

	2005	2004	2003
Operating revenues			
Central government grant	677 144	659 108	645 252
Revenues from commissions, fees and other remuneration	181 215	189 701	164 528
Revenues from grants	443 656	441 127	516 277
Total	1 302 015	1 289 936	1 326 057
Operating costs			
Rent	199 991	182 363	195 566
Running costs	271 861	323 758	302 230
Personnel costs	759 482	788 350	781 348
Total	1 231 334	1 294 471	1 279 144
Total before depreciation	70 681	-4 535	46 913
Depreciation	58 910	64 262	67 695
Total after depreciation	11 771	-68 797	-20 782
Financial income and costs			
Net financial income/costs	-1 281	2 016	5 842
Net transfers	0	-536	-28 448
Change in capital before adjustment for externally financed equipment	10 490	-67 317	-43 388
Adjustment for externally financed equipment	0	678	3 741
Change in capital after adjustment for externally financed equipment	10 490	-66 639	-39 647

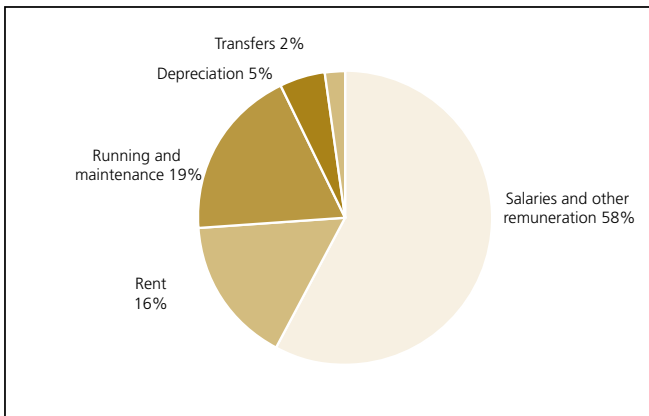
Balance sheet (SEK thousand)

	2005	2004	2003
Assets			
Inventory	140 186	149 838	170 516
Accounts receivable, advances and other accounts owing	22 799	37 214	28 011
Accrued revenue	82 962	104 441	314 852
Other current receivables	6 582	7 346	
Cash	269 322	213 320	231 974
Total assests	521 851	512 159	745 353
Liabilities and agency capital			
Agency capital			
Change in capital brought forward	-312	67 635	111 533
Change in capital for the year	10 490	-67 317	-43 388
Liabilities			
Other current liabilities	12 750	21 811	28 809
Loans	21 776	12 956	10 665
Accounts payable	8 359	9 639	8 698
Prepaid revenue	425 872	422 453	581 923
Accrued salaries	42 916	44 982	47 113
Total liabilities and agency capital	521 851	512 159	745 353

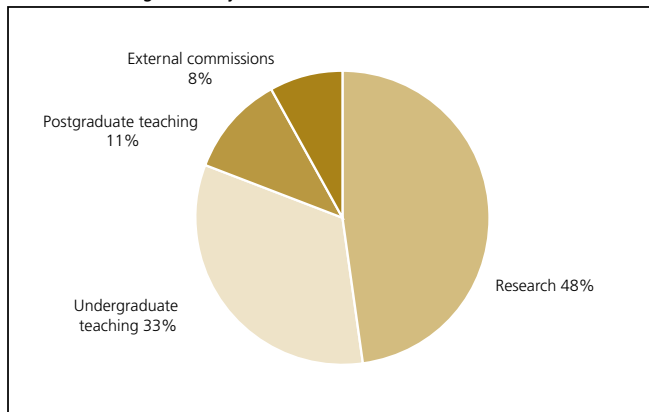
Revenue and costs for each activity (SEK milllion)

	2005	2004	2003
Total LTH			
Revenue	1 328	1 334	1 360
Costs	1 318	1 401	1 403
Profit/Loss	10	-67	-43
Undergraduate teaching			
Revenue	459	452	442
Costs	432	448	457
Profit/Loss	27	4	-15
Research & postgraduate teaching			
Revenue	751	780	812
Costs	765	841	845
Profit/Loss	-14	-61	-33
Commissions			
Revenue	118	103	106
Costs	121	113	102
Profit/Loss	-3	-10	4

Distribution of costs



Costs according to activity



The Board

1 January 2003–31 December 2005



Anders Narvinger
Chairman,
Managing Director,
Teknikföretagen



Gunilla Jönson
Dean, Professor



Klas Malmqvist
Deputy Dean, Professor



Monica Almqvist
Postdoctoral Fellow

Student representatives



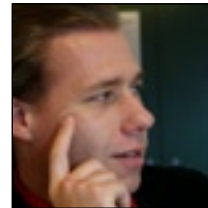
Karin Brundell-Frej
University Lecturer



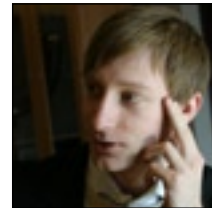
Stina Gestrelus
Deputy Managing Director,
Biora AB



Olof Hågerstedt
Student



Peter Larsson
Student



Nils Mattisson
Student

Representatives for personnel organisations



Hans Hansson
Professor



Tord Wingren
Managing Director,
Samsung Europe



Gustav Ekberg
Senior instrument maker,
The Union of Service and
Communication Employees
(SEKO)



Teresa Hankala-Janiec
Teaching Assistant,
The Swedish Confederation
of Professional Associations
(SACO)



Christer Nilsson
Research Engineer,
The Swedish Confederation of
Professional Employees, (TCO)



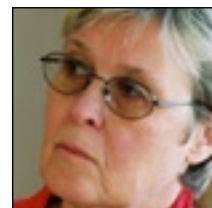
Guido Zacchi
Professor



Karl Åström
Professor



Per Göran Nilsson
Administrative Director



Christina Holm
Secretary

Key Facts and Figures

Revenue & Achievements

	Unit	2005	2004	2003
Government grants (UT)	SEK million	422	409	399
Full-time equivalents achieved	FTE	5 498	5 761	5 642
Annual performance equivalents achieved	APE	4 978	5 009	4 673
APE/FTE	%	91%	87%	83%
Government grants/FTE	SEK thousand/FTE	77	71	71
MScs and architecture degrees required by govt. 01-04	Number		2 510	2 510
MScs and architecture degrees awarded 01-04	Number		2 595	1 862
Success rate	%		103%	74%
MScs and architecture degrees required by govt. 05-08	Number	2 800		
MScs and architecture degrees awarded 05-08	Number	828		
Success rate	%	30%		
Other external revenue (UT)	SEK million	13	18	12
Other external revenue/government grant (UT)	%	3	4	3
Other external revenue/FTE	SEK thousand/FTE	2	3	2
Total external revenue (UT) excluding commissions	SEK million	435	427	411
Total external revenue (UT)/FTE	SEK thousand	79	74	73
Lecturers	Number	207	208	198
FTE/lecturers	FTE/lecturer	27	28	28
Teaching assistants	Number	86	100	109
FTE/teaching assistants	FTE/teaching ass.	64	58	52

Revenue excluding interest and transfers. FTE based on data from LTH's departments.
UT – Undergraduate teaching

Commissions

	Unit	2005	2004	2003
Teaching	SEK million	11	8	13
Commissioned courses/grant-financed teaching	%	3	2	3
Research and postgraduate education (R&PG)	SEK million	107	97	89
Commissioned R&PG/grant-financed R&PG	%	42	39	37

Research and postgraduate education

	Unit	2005	2004	2003
Government appropriation (R&PG)	SEK million	252	248	239
Govt. appropriation (R&PG)/govt. grant (UT)	%	60	61	60
Science Research Council	SEK million	85	78	86
FORMAS	SEK million	28	25	28
Foundation for Strategic Research	SEK million	39	46	41
EU	SEK million	66	58	41
Swedish Energy Agency	SEK million	54	69	71
Vinnova	SEK million	45	50	77
Total	SEK million	317	326	344
Total/government appropriation (R&PG)	%	126	131	144
Other external revenues	SEK million	122	112	178
Other external revenues/govt. appropriation (R&PG)	%	48	45	74
Total external revenues, R&PG (excl. commissions)	SEK million	691	686	761
Total external revenues, R&PG per doctorate	SEK million	5.1	5.4	6.7
Postgraduate FTE	Number	436	503	510
Licentiate degrees	Number	73	63	91
Govt. appropriation (R&PG) per Licentiate degree	SEK million	3.5	3.9	2.6
Degrees/postgraduate students	%	17	13	18
Doctorates	Number	135	127	114
Govt. appropriation (R&PG) per Doctorate	SEK million	1.9	2.0	2.1
Degrees/postgraduate students	%	31	25	22
Professors	Number	178	180	171
Govt. appropriation (R&PG)/professors	SEK million	1.4	1.4	1.4
Grants (R&PG)/professors	SEK million	2.5	2.4	3.0

Academic staff

	Unit	2005	2004	2003
Teachers with doctorates	Number	425	434	466
External revenue (UT) per teacher	SEK million	1.0	1.0	0.9
External revenue (R&PG) per teacher	SEK million	1.6	1.6	1.6
External revenue (UT+R&PG) per teacher (excl. commissions)	SEK million	2.6	2.6	2.5
FTE per teacher	Number	13	13	12
Licentiate degrees per teacher	Number	0.17	0.15	0.20
Doctorates per teacher	Number	0.32	0.29	0.24

The figures given above are based on revenues and costs in research and postgraduate teaching, in contrast to the figures for external income in the financial report.



LUND UNIVERSITY

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