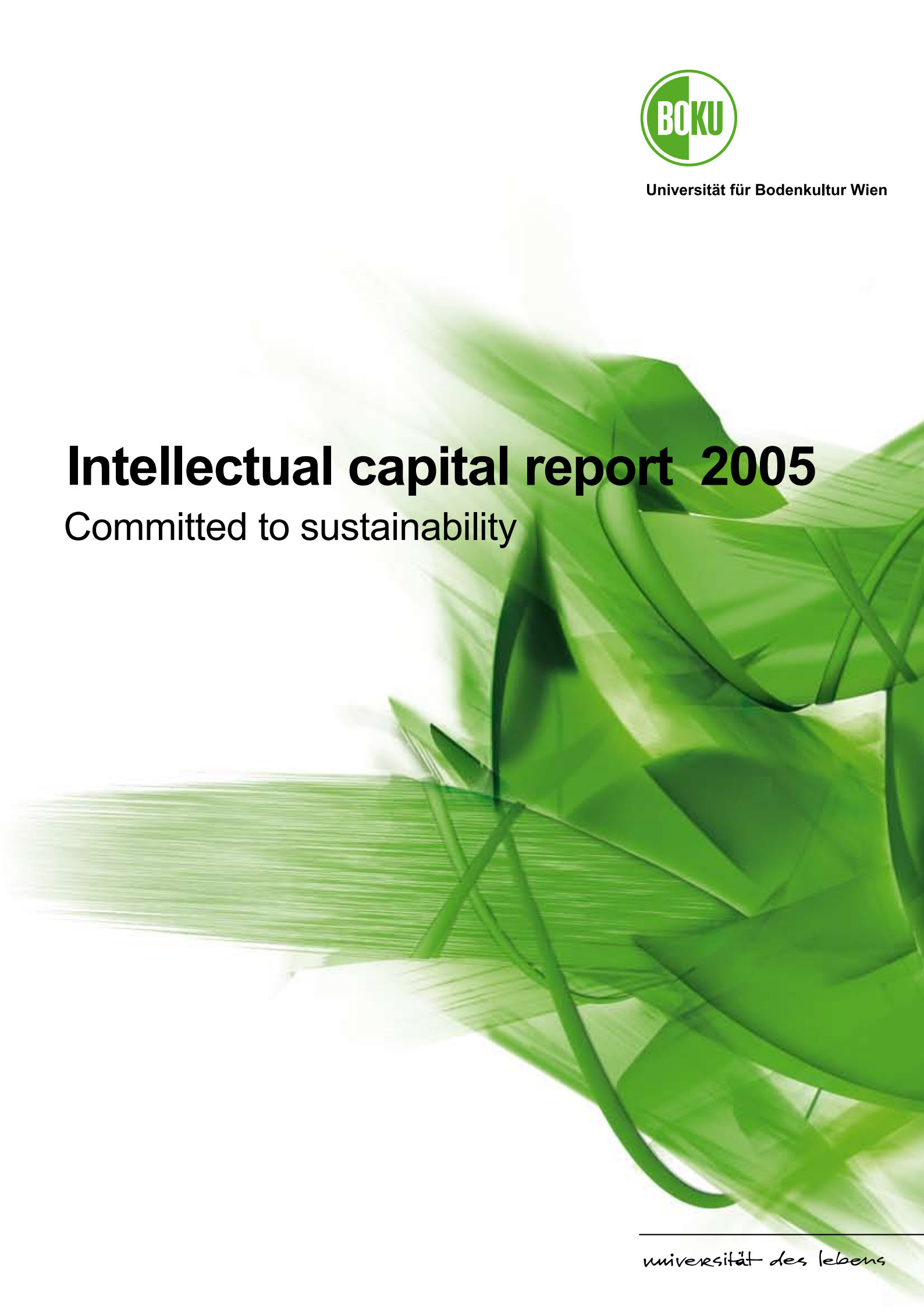
Universität für Bodenkultur Wien

Intellectual capital report 2005

Committed to sustainability



universität des lebens

EMAS
Geprüftes
Umweltmanagement
REG.NO. AT-500

An overview of sustainability indicators

Table 2

Staff on due date October 15 2005

Staff equivalent to full time positions	Females	Males	Total
Total number of academic and art staff[1]	77.0	269.3	346.3
Professors[2]	8.0	52.8	60.8
Assistants and other academic and art staff[3]	69.0	216.5	285.5
including assistant professors[4]	21.3	100.5	121.8
Total number of general staff[5]	227.9	195.6	423.5
Total[6]	304.9	464.9	769.8

1 functions 11, 14, 16, 21 according to subsection 2.6 of Appendix 1BidokVUni.
2 functions 11 according to subsection 2.6 of Appendix 1BidokVUni.
3 functions 14, 16, 21 according to subsection 2.6 of Appendix 1BidokVUni.
4 functions 14 according to subsection 2.6 of Appendix 1BidokVUni.
5 functions 23, 40 to 70 according to subsection 2.6 of Appendix 1BidokVUni.
6 functions 11, 14, 16, 21, 23, 40 to 70 according to subsection 2.6 of Appendix 1BidokVUni.

Table 35

BOKU environmental indicators 2005

	comparatively
Energy	
Electricity consumption[1]	10.4 MWh/MA
	142.9 kWh/m²
Heat generation	8.2 MWh/MA
	113 kWh/m²
Water	
Water usage[2]	168.3 l/MA/d
Material and product consumption	
Paper/ copy paper consumption	3,663 Blatt/MA
Waste	
Total waste (minus biological waste)[3]	255 kg/MA
Recycled waste (percentage of processed waste)[4]	51 %
CO_2 emissions (total)	
CO_2 emissions (operation, automobile fleet minus business trips)[5]	4.3 t/MA

1/2 The high consumption of electricity and water is caused by the research centers at Muthgasse.
3 For waste data the total amount of waste was included minus the amount of biological waste composted on site.
4 The percentage of recycled waste is based on the percentage of potential recyclables of the total waste.
5 CO_2 emissions are caused by energy consumption on site and the operation of the automobile fleet, business trips are excluded from the calculations.

Table 1

An example of budget indicators as reported on December 31 2005 (in €)

Revenue from global budget funded by the government	72,567,216.09
Tuition income	3,339,216.54
Research income	18,241,522.98
Expenses for tangible means	2,041,565.91
Salaries	45,952,276.37
including refunds paid to the government for public servants assigned to the university	16,620,914.00

Table 36 *(An example of indicators)*

Number of degrees awarded in the academic year of 2004/05

Type of degree	Females	Males	Total
Total	215	250	465
including diploma degrees	161	181	342
including bachelor's degrees	8	7	15
including doctoral degrees	44	53	97

Table 42

Number of scientific publications of the staff in 2005

Articles published for the first time in SCI journals (source: SCI exp./SSCI: articles in listed journals)[1]	288
Articles published for the first time in other scientific journals	324
Articles published for the first time in collected editions	121
Articles published for scientific congresses (proceedings)	900

1 see above; SSCI: articles according to Journal Citation Report

Profile and structure of the report

The present report is composed of two different parts. The first part, the intellectual capital report 2005, follows the reporting structure of the Intellectual Capital Report Act published in February 2006. The second part includes an overview of the sustainability report according to the Global Reporting Initiative.

Sections pertaining to the sustainability report are integrated into the intellectual capital reporting model used by the University of Natural Resources and Applied Life Sciences, Vienna, hereafter "BOKU". Furthermore, the GRI guidelines have been enclosed in the appendix, following the actual report, and are supposed to provide an overview of the chapters of the sustainability report, including cross references, also to chapters of the intellectual capital report, with exact page numbers.

BOKU has adhered to the EMAS system ever since 2006, which has yielded a separate declaration on the environment. Parts of this declaration have been published as chapters of the intellectual capital report and have been validated by Llyods Register Quality Assurance as environmental specific information. The environmental management system includes all premises pertaining to the Türkenschanze and Muthgasse locations.

Indicators for education for the academic years of 2004/05 and 2003/04 were evaluated by the Federal Ministry for Education, Science and Culture based on raw data submitted by BOKU and made accessible to BOKU for generation of the present report.

BOKU indicates for almost all indicators that are to be published in 2006 for the calendar year of 2005 according to the interim provisions of the Intellectual Capital Report Act, figures for two calendar and/or academic years. Additionally, a number of indicators are presented and interpreted that are to be published starting next year according to the Intellectual Capital Report Act, as well as a list of optimal indicators. Educational indicators refer to, unless otherwise specified, the respective academic years of 2004/05 and 2003/04, all other indicators to the calendar years of 2005 and 2004. Indicators regarding staff, premises and mobility are assessed on each due date (such as the specified winter semester due date for mobility) and refer to staff and premises on the respective calendar year. Indicators that are to be published as part of a sustainability report refer exclusively to the calendar year of 2005, unless they overlap with indicators of the intellectual capital report (e.g. staff). Indicators that have been previously published as part of the first intellectual capital report of BOKU will also be included, particularly if the definitions of the indicators have been amended.

For further information regarding BOKU, particularly the areas of education, research, societal objectives, as well as social and ecological responsibility, please consult BOKU's homepage. A detailed overview of current research activities and a publication list of all BOKU researchers and their contribution to the scientific community and to society are available in the research database of BOKU.

Intellectual Capital Report Act: *http://www.bmbwk.gv.at/medienpool/13099/wbv.pdf*
Global Reporting Initiative: *http://www.globalreporting.org/*

BOKU Website: *http://www.boku.ac.at*
BOKU declaration on the environment: *http://www.boku.ac.at/7529.html*
BOKU Intellectual Capital Report 2004: *http://www.boku.ac.at/6043.html*
BOKU Research Database: *http://bokudok.boku.ac.at/bokudok/research_database.search*

universität
des
lebens

index

The framework

The performance

The future

Knowledge with responsibility – Responsibility with knowledge

Universities are responsible for expanding and furthering knowledge by way of research for the application of that knowledge through knowledge transfer along with further development in an academic and practical context, as well as for utilizing knowledge for the respective benefit of all humans and their habitat.

Each university should be required to report on how adequately and effectively its tasks are fulfilled; a responsibility to itself, but above all to the bodies of the state and society that contribute to positive development and actions of the university by giving support and in turn receiving cultural and economic impulses.

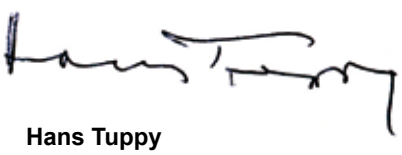
We expect from academic science not only a general expansion of our knowledge and scope of action, but also specific contributions to understanding and resolving major problems that we are currently facing or that we will be confronted with in the future. One of the most relevant and challenging problems is certainly the preservation, development and improvement of vital resources – a field that BOKU is particularly active in within research, education and consultation.

Gaining and applying knowledge relevant to both people and society involves much responsibility. In this sense, BOKU presents itself as a “Responsible University”. Employees, researchers and teaching staff, as well as students and graduates of a university have to be aware – even more so than other decision makers – that acting in a responsible way must not be justified by ideals only, but involves the adequate application of optimal topical, methodical and contextual knowledge.

For meeting future and continuously changing challenges in biologically and BOKU relevant fields – such as the protection and development of renewable biotic resources, spatial planning, nutrition, health, energy supply and climate – scientific, engineering, social and economic knowledge and technologies available today will not suffice, but rather innovative and active research is called for. The objective of sustainability requires forward thinking; future oriented knowledge and measures will become necessary. BOKU’s development plan was designed to comply with said future-oriented perspective.

It is impressive and encouraging that and how the present performance report of BOKU encompasses achievements in research and education (the actual “intellectual capital report”), its responsibility towards people and society, the protection of the environment, as well as sustainable development. In this context, particularly BOKU’s recent certification according to the Eco-Management and Audit Scheme (EMAS) merits mention; for it provides evidence that the university does not only externally require protection of the environment, but it also complies with such requirements within its own operational setting.

I would particularly like to thank the authors of the intellectual capital report and furthermore all those who have contributed to successful and sustainable achievements of BOKU.



Hans Tuppy
Head of the University Council

Knowledge, balance and sustainability

Sustainability has become a buzzword in recent years. As a BOKU graduate, I am however aware of the fact that the “Universität des Lebens” has adhered to that motto ever since the early days of its foundation in the 19th century.

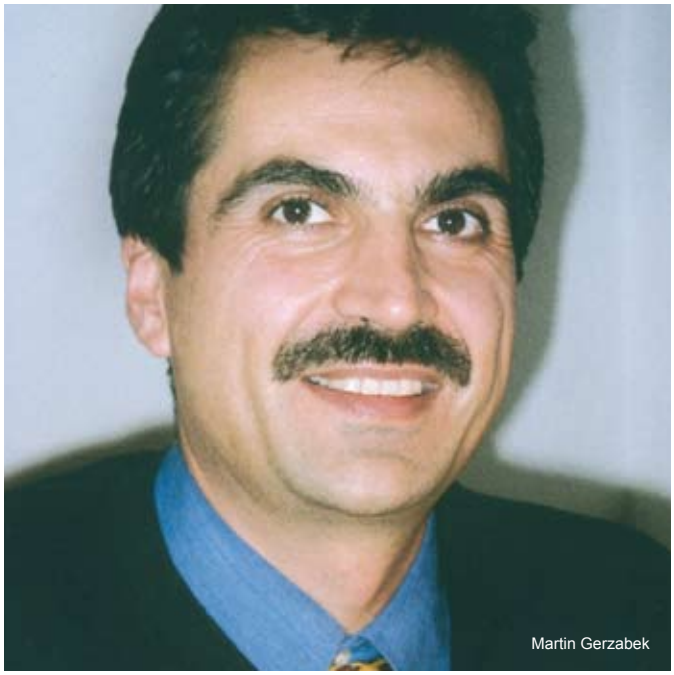
Generation-oriented thinking, which is characteristic for BOKU unlike for any other university, was born as a result of the growing awareness that the forest is only able to provide as much lumber as it continues to regrow, thus guaranteeing future generations access to the same resources in sufficient amounts.

As Minister for Agriculture, Forestry, Environment and Water Management, I not only support sustainability in theory but also in practice. Sustainability in terms of protecting natural resources involves also social, economic and ecological aspects. Furthermore, transparent and verifiable presentation of achieved results is important, and consequently open internal and external communication, particularly in terms of a dialogue with the economy, politics and the general public.

BOKU shows in its current report that an educational and research institution does not have to limit sustainability to classic areas of research and education only, but may rather apply its principles as “a responsible and sustainability practicing university” for the benefit of the economy and society. This commitment to adopting social responsibility in ecological and social terms and communicating and making the said responsibility also externally verifiable are further relevant steps BOKU has undertaken in a series of developments witnessed in recent years. EMAS (Eco-Management and Audit Scheme) certification and thus monitoring of internal processes and the publication of its first sustainability report are evidence for BOKU’s involvement in ecological and social matters.

I would like to congratulate BOKU on its outstanding achievement, having combined an intellectual capital report with a sustainability report as the first university in Europe. Consequently, it succeeded in expanding its concept as a “Responsible University” beyond research and education to the areas of “ecological responsibility” and “social responsibility”, thus generating new impulses for non-university educational and research institutions in Austria and Europe, and ultimately contributing to the sustainable development of Austria.

Federal Minister Josef Pröll


Martin Gerzabek


Hubert Dürrstein

BOKU, a “sustainable university”

Approximately one year ago, BOKU presented its first comprehensive intellectual report, providing an overview of detailed internal strategy processes since the beginning of the millennium and the vision of becoming a nationally and internationally renowned “Responsible University”.
In this context, we would like to thank for much positive and encouraging feedback.

Although only one year has passed ever since, we are able to report of relevant milestones that have been achieved in the meantime. The development plan was widely approved and passed by the University Council and the Senate, thus establishing guidelines for the immediate and medium-term future. Following a comprehensive internal planning and voting process the draft of a first performance agreement was presented, which was generated based on the development plan and the first intellectual capital report.


Erika Staudacher

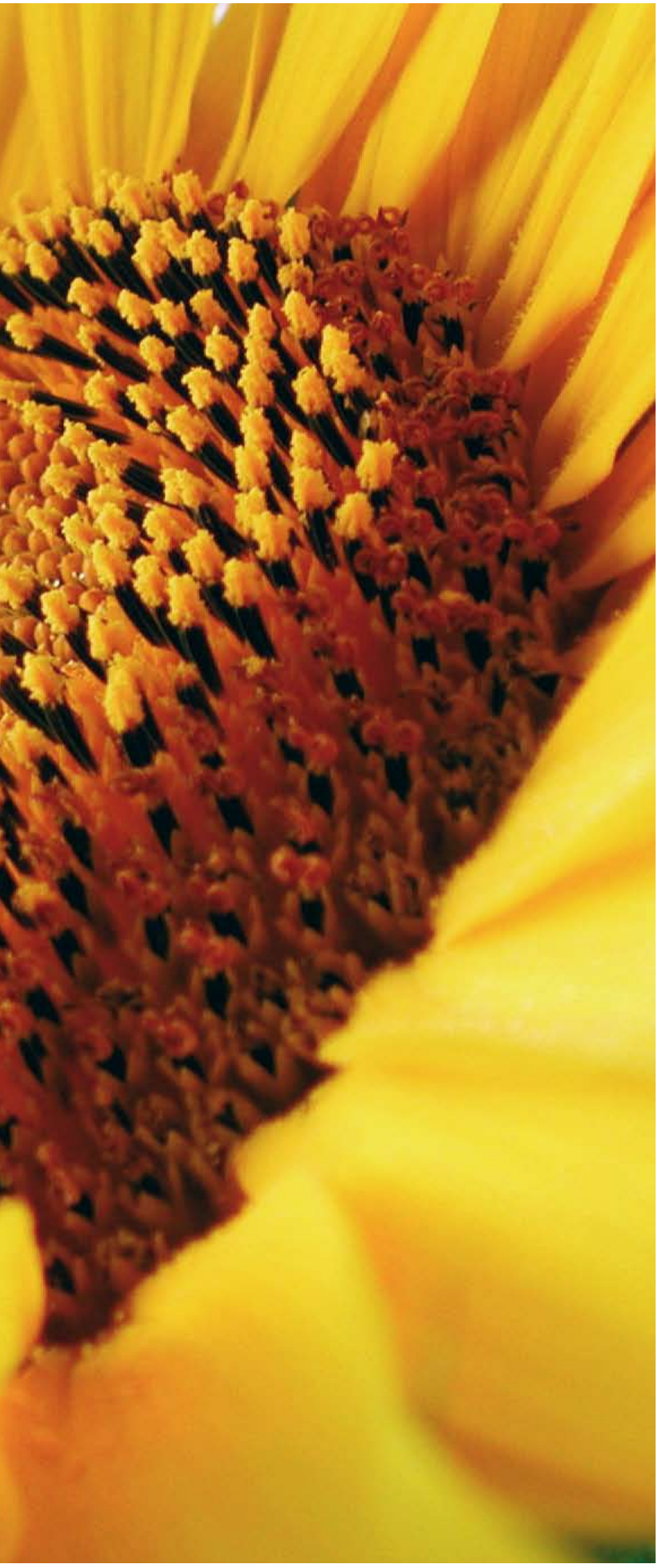
As for the year prior, the present intellectual capital report 2005 is also an experiment. This time the focus is placed on actively promoting further development of BOKU towards sustainability and the implementation of pursuant goals. After signing the Copernicus University Charter for Sustainable Development in 2001, in 2002, BOKU was awarded the ECOPROFIT enterprise title by the city of Vienna in the context of the ECOPROFIT initiative, and in 2005, the Eco-Management and Audit Scheme certification was pursued together with the generation of a sustainability report according to Global Reporting Initiative guidelines. BOKU successfully completed an environmental management system according to EMAS in the first quarter of 2006 – as the first university worldwide. Thus, in the future BOKU will be able to practice sustainability as an institution even better. The present intellectual capital report includes the sustainability report, integrated into the reporting structure of the intellectual capital report, and furthermore expanded by indicators of the sustainability report. The results for 2005 – also compared to those of 2004 – show that BOKU is on the right track. Relevant indicators for the output within education and research have continued to improve.

In this context the Rectorate would like to thank: first of all, its staff for their outstanding achievements within the past year that are reflected by excellent indicators, a large number of our cooperating partners in Austria and worldwide, external staff that has contributed to discussions in the context of generating the intellectual capital report, as well as all BOKU employees that have assisted in the development of the intellectual capital report, in particular the intellectual capital report project team.

Hubert Dürrstein
Rector

Martin Gerzabek
Vice-Rector for Research

Erika Staudacher
Vice-Rector for Education and Internationalization



1

The Framework

Vision, mission and competency profile –
BOKU's strategic direction
The concept "Responsible University" /
About the Universität des Lebens /
Balance with system – BOKU's value creation model

Vision, mission and competency profile – BOKU's strategic direction

In recent years BOKU has been looking in depth at its own direction and structure. From this extensive bottom-up led process, a new department structure for BOKU has emerged in addition to a set of global objectives which were published in a comprehensive form in the intellectual capital report 2004. These principles are summarized in short form in the following extract.

The "Responsible University" – a vision materialises

As an education and research institution, BOKU aims to be the key advisor to political decision-makers as well as a popular contact point for citizens and businesses with key questions about using and safeguarding vital natural resources. Within the socio-political discourse, which in the coming decades will see an increase in tension between man, nature and economic development, a key requirement is funded scientific analysis to determine the background and context. However, analysis alone is insufficient.

A university that sees itself as a responsible and formative power within society is faced with the challenge of finding answers and devising workable solutions which stand up under practical application. BOKU would therefore like to make an active contribution to the responsible creation and management of our habitats. Pioneering new technologies and processes to make use of natural resources will be developed to this end. What is more, successful strategies and methods will have to be developed to deliver quality in the production of plant and animal foodstuffs and thus also a healthy diet for people in industrialised and developing countries.

BOKU's vision and principle of action is to pursue such in accordance with societal and economic interests, as well as ecosystemic possibilities.

Within the discourse of societal groups, it is necessary to increase awareness of the general public and of decision-makers for complex interactions. BOKU considers such a dialogue with various participants outside of the scientific system a major challenge. The aim is to transport fundamental results, problems and approaches in an understandable manner to a broad public. Here, BOKU aims at finding new means of preparing, conveying and transferring knowledge. Within its scope, BOKU promotes together with its staff opinion formation – based on well-founded scientific findings – and appropriation of knowledge. The vision of contributing to develop and safeguard a democratic civil society in all countries is a vision that should always be prioritized.

Knowledge creates responsibility – BOKU's self-concept and mission

The historical roots of BOKU can be found ever since its foundation in 1872 within agriculture, forestry and water management (resource orientation). Due to increasingly complex requirements and problems that required expertise beyond the actual field of interest the spectrum of topics and the areas of expertise have broadened in the course of its progress. The Zentrum für Umwelt- und Naturschutz (Center for Environment and Environmental Protection) was founded in 1980 in response to the increasing societal significance of the topics ecology, environment and environmental protection (ecolization), along with the academic programme "landscape ecology and landscape planning". The foundation of the Zentrum für Angewandte Genetik (Center for Applied Genetics) and renaming of the topic "foodstuff and biotechnology" marked the beginning of the high-tech-era of research for BOKU (Life Sciences) for BOKU. This trend was furthermore supported by opening of the Inter-university Research Institute for Agrobiotechnology (IFA-Tulln).
More than ten years later, in 1998, the foundation of the first

Christian-Doppler laboratory marked the beginning of an intensified approach to industrial utilization (bridge to application). As a result of this development, BOKU researchers are able to operate autonomously without external assistance, performing everything from agricultural to nanobiotechnological research, to the generation of socioeconomic models, for the benefit of economy and society, and by only using resources pertaining to the university (“Scientific One-Stop-Shop”).

At the beginning of the 21st century, BOKU became a “brain port” for talented individuals who dedicate their careers to an overall objective: the sustainable development of society.

In a democratic-pluralistic society, the guiding principle of “sustainability” is certainly impacted by different ideas and conflicting interests. BOKU’s aim cannot be an exact and binding definition of a sustainable future. Sustainable development is to be seen as a dynamic search, learning and development process within society. Science and thus BOKU’s research activities contribute to substantiating different ideas of sustainability: through models and scenarios, their analysis in terms of ecological, economic and societal-social consequences, and through providing and critically reflecting upon assessment concepts and indicator systems. On the one hand, activities are to be directed towards opportunities and requirements of a globalized society, while still considering national and regional needs.

Thus, research and education at BOKU adhere to a holistic model and integrate principles of inter- and transdisciplinarity in a systematic manner, alongside the three types of knowledge, systemic knowledge, orientation knowledge and conceptional knowledge. Based on these types of knowledge BOKU is able to complete its key mission: researching and conveying scientific, technical, socio-economic, political and socio-cultural alternatives of sustainable, future-oriented utilization and preservation of vital natural resources.

Previous successes, particularly those within science and technology are primarily based on the analysis and structuring of mostly small and clearly defined units. BOKU’s research topics may however only rarely be reduced to isolated individual phenomena. Rather interlinked processes in complex systems are investigated by several academic disciplines. BOKU researchers aim to understand these processes and in particular interactions between natural and human systems.

However, developing systemic perspectives is a long process for an individual researcher. In order to include the diversity of a problem and to still work in a scientifically professional manner, successful methods in a specialised discipline have to be integrated alongside the ability to remain open to other scientific approaches. Proximity of the institutions, as well as personality traits and social skills of the researcher influence the degree and quality of the integration.

Aside from established working groups, informal contacts can be just as beneficial.

One of the central tasks is to train young scientists that are able to participate in a qualified and critical manner in social and economic topics and thus impact the future. Topics pursued in research are paralleled in education too: BOKU has established itself as a leading force within experimenting and applying new types of teaching and learning sustainability. Not only this combination of recent socially relevant topics and the strong integration of the context make BOKU so appealing to students, but also resulting career opportunities for our graduates. BOKU graduates also hold leading positions in many countries outside of Austria.

Beyond its achievements in research, education and services, BOKU sees its social role as actively promoting equal opportunities and democratic principles and rule of law. This implies

an attitude that prioritizes openness towards new phenomena, allowing for diversity of opinion and supporting external and internal interactions with other cultures without prejudice. BOKU also participates in a responsible manner in the public discussion regarding societal problems and their sustainable resolution, while considering gender sensitive perspectives. To fulfil said tasks BOKU cooperates with key entities in science, business, politics and society in and outside of Austria.
BOKU-relevant social challenges require a comprehensive understanding for innovation. The democratic-constitutional society with its economy and structures of a civil society are regarded a learning innovation system. In research and education, BOKU's aim is an integrative perspective of different social levels and their interaction:
businesses, value creation chains, consumerism (micro level), communes, regions, networks and clusters (meso level), as well as politics, frameworks, institutions and norms (macro level).

On European level, with its mission BOKU fulfils the new role stipulated for universities in a "Europe of knowledge".
It covers the entirety of knowledge appropriation, transfer and dissemination, as well as knowledge application. BOKU's objective is to develop and strengthen the innovative and creative context in Vienna and Austria through increasingly integrating its own approaches and opportunities in research and teaching networks. This establishes its position as a recognised, equal partner within the international university and research landscape. On the other hand, with its intensive application orientation BOKU also contributes to implementing scientific results on a local, regional and national level, thus promoting Austria as a business location. Furthermore, with its expertise BOKU supports decision-makers in business, administration and politics, as well as representatives of Austrian interests on European level and as members of international panels.

Our environmental guidelines

As Universität des Lebens, BOKU stands for research and education of the sustainable utilization of natural resources. Thus, it aims to contribute to safeguarding of vital natural resources for future generations. As a responsible university, BOKU is particularly interested in actively participating in protection of the environment, to thus become a sustainable organisation.

BOKU aims at reducing environmental pollution in its operations by:

- using energy efficiently and advancing the application of renewable forms of energy,
- saving water,
- developing and implementing an environmental-friendly supply system for products, materials and services,
- separating unavoidable waste in a consistent manner and recycling it if possible and
- by planning buildings according to energy efficient standards, and building and remodelling them in accordance with ecological criteria.

BOKU develops organisational requirements for implementing said guidelines in actual projects at the university and continuously evaluates their success. It adheres to all relevant legal requirements and internal guidelines.
BOKU actively integrates its staff and student body, informs them periodically and promotes exemplary environmental-friendly behaviour.

Overall BOKU aims to apply the multitude of results within environment centred research conducted at the university for its own organisation. Through the close interaction of research and application, BOKU has thus established itself according to its byname Alma Mater Viridis as a sustainable institution.

The concept "Responsible University"

BOKU has already presented the concept "Responsible University" in its first intellectual capital report (see intellectual capital report 2004), which is the basis for the present report and will be outlined briefly in the following. The same goes for the present and future reporting structure, which according to the Intellectual Capital Report Act contains structural elements of an intellectual capital report and relevant elements of a sustainability report based on GRI guidelines. The latter requires an increased focus on the socio-ethical and (entrepreneurial) ecological responsibility of a university beyond the focus of the intellectual capital report.

Economic responsibility

The concept "entrepreneurial university" that was developed in recent years includes important approaches, while it appears to be rather limited considering the global challenges that also science is facing. However, basic research without doubt aims to bridge gaps to the actual practice. The approach roots in the quest for new findings, prompting decided "basic research with application alternatives" (Max-Planck Society) and yielding results that seek application. In this process, entrepreneurial elements and corresponding personality structures are relevant.

Thus, science and entrepreneurship have much in common in terms of an entrepreneurial and explorative mindset and inherent patterns of actions.

Political responsibility

While previously the development of a mechanistically dominated worldview was emphasized during the 20th century, a systemic and more complex perspective of nature, society and economy has started to emerge. Consequently, a deeper understanding of cause and effect and loop circuits has developed.

The requirement for objectivity is not the only criterion for science anymore. At the same time, consequences for society, nature and economy have become relevant. Scientists are not necessarily required to take sides but to couple their scientific talent with societal responsibility and dedication. Both, research and education are required to contribute in this sense.

Systemic approach and perspectives beyond one's field of activity

New insights often require a recombination of pre-existing knowledge. Here, different research approaches that reach beyond one's field of activity are the motivating force. In this context, interdisciplinarity refers to working jointly on the same topic in different academic disciplines. In multidisciplinary research projects, many experts collaborate on different aspects of a common topic (e.g. climate change). Transdisciplinary research projects are characterised by actively integrating (by way of dialogue) all protagonists. BOKU has increasingly offered and adopted interdisciplinary programs.

In practice, new languages and perspectives have to be understood and integrated in one's own research approach and knowledge transfer processes. Aside from a continuously developing specialization in disciplines, individual scientists may risk less recognition by the scientific community. Nonetheless, society expects the scientific community to network with other disciplines, to use a language generally understood by the public and to anticipate the consequences of its actions for society.

Social responsibility

As educational institutions, universities are required to find a clear response to occurring demographic changes. Externally, for BOKU this implies the gradual expansion of its continuing

education repertoire, while internally new teaching and learning forms and the corresponding context have to be developed congruent with newly emerging needs. Employee satisfaction, advancing females .e.g. female researchers at the workplace and in society, childcare opportunities for young parents, a balanced range of blended learning opportunities and responsible interactions with partners, particularly those from developing countries, are only a few examples in this context.

Ecological responsibility

Sustainability has become a frequently cited and somewhat improperly used buzzword. The underlying principle is however still relevant for the future of our society. Natural resources and habitats are not limitless. This scarcity has particularly been reflected by the first images transmitted from space. Scarce resources have already become the source of distribution conflicts that will become more intensified and pronounced if public opinion will not shift. Therefore, it is our responsibility to carefully use available resources and to establish a sound balance between the North and South.

In an increasingly complex world with an information overflow and specialized knowledge, it becomes the responsibility of a modern university to enable orientation and to present alternative modes of action for actual problems.

For BOKU ecological responsibility implies to focus topics of research and teaching on ecological challenges of society. Furthermore, it is our aim to reduce environmental pollution caused by the operations of our university. In 2006, BOKU has generated and evaluated an EMAS congruent environmental management system for this purpose.

Core processes of the “Responsible University”

Against this background, universities have to expand their range of services. In addition to traditional core processes of research, education and continuing education, another aspect gains significance: societal and economic development.

Thus, a complete unit of value creation develops from generating new knowledge, to transferring and applying it in practice. In the context of national innovation systems, universities will also be mainly responsible for basic research in the future. Even if in the context of short term planning and perspectives basic research may appear tedious and expensive fundamental knowledge proves essential for innovation and problem solving in practice. Basic research is a requirement for developing a sustainable society.

About the “Universität des Lebens”

The organisation

BOKU has recently reorganised its scientific and service departments, thus creating a new organisational structure *(Figure 1)*. According to the organisational plan of the University of Natural Resources and Applied Life Sciences, Vienna, aside from the three service boards mentioned in the Universities Act 2002 (University Council, Rectorate and Senate) BOKU consists of 14 scientific departments and a range of service units.

Its departmental structure and research topics can be seen as a systematic response to the challenges of “research and education for life”: By the integration of engineering and natural sciences on the one hand, and social, legal and economic studies on the other, a circumstance which is unique in Austria, BOKU is able to provide comprehensive knowledge about the system human being – society – environment. This information can be used for knowledge-based decision-making processes in politics and administration, as well as for resolving social and economic problems. Regional and international requirements are considered in this context.

Rectorate
The Rectorate of BOKU includes:
Rector Prof. Dr. Hubert Dürrstein, Prof. DI Dr. Martin Gerzabek, Vice-Rector for Research, and Prof. DI Dr. Erika Staudacher, Vice-Rector for Education and Internationalization.
On 1 October, 2003 the by-laws pertaining to the Universities Act 2002 were enacted *(http://www.boku.ac.at/7955.html)*.

The by-laws stipulate two associated panels that are responsible for decision-making: i) an advisory board that includes the Rectorate, the head of the Senate, a coordination office and other informative staff if necessary and ii) a conference of department heads that include all heads of scientific departments and service units.

University Council
The University Council of BOKU that forms the management board is composed of seven members, three of which are female. Em. Prof. Dr. Hans Tuppy is head of the University Council. The University Council is entitled to obtain information about all university related matters, university departments are required to provide information requested or to perform surveys ordered by the University Council. A complete overview of rights and obligations of the University Council according to § 21 paragraph 1 of the Universities Act 2002 can be found at:
http://www.boku.ac.at/1179.html

The Senate
The Senate is one of the service bodies of the university and is directly elected by members of the university. The Senate of BOKU includes nine representatives of university professors, two representatives of non-professorial teaching staff, a representative of the general university staff and four student representatives.

The structure and competencies of the Senate conform to the regulations of the Universities Act 2002, the statutes and resolutions of the University Council. The Senate remains in office for three years, as well as bodies appointed by the Senate whose term of office may respectively be subject to their functions (e.g. appointment and habilitation boards, ad hoc affiliated bodies). The by-laws of the Senate and the preliminary statutes of BOKU can be found at:
http://www.boku.ac.at/senat.html

Scientific departments
The departments are the central education and research units of the university. They form the basic structure that guarantees necessary continuity. Ideally, they are supposed to represent different fields of competency and their typical identity. Planning and managing instruments are target agreements with the

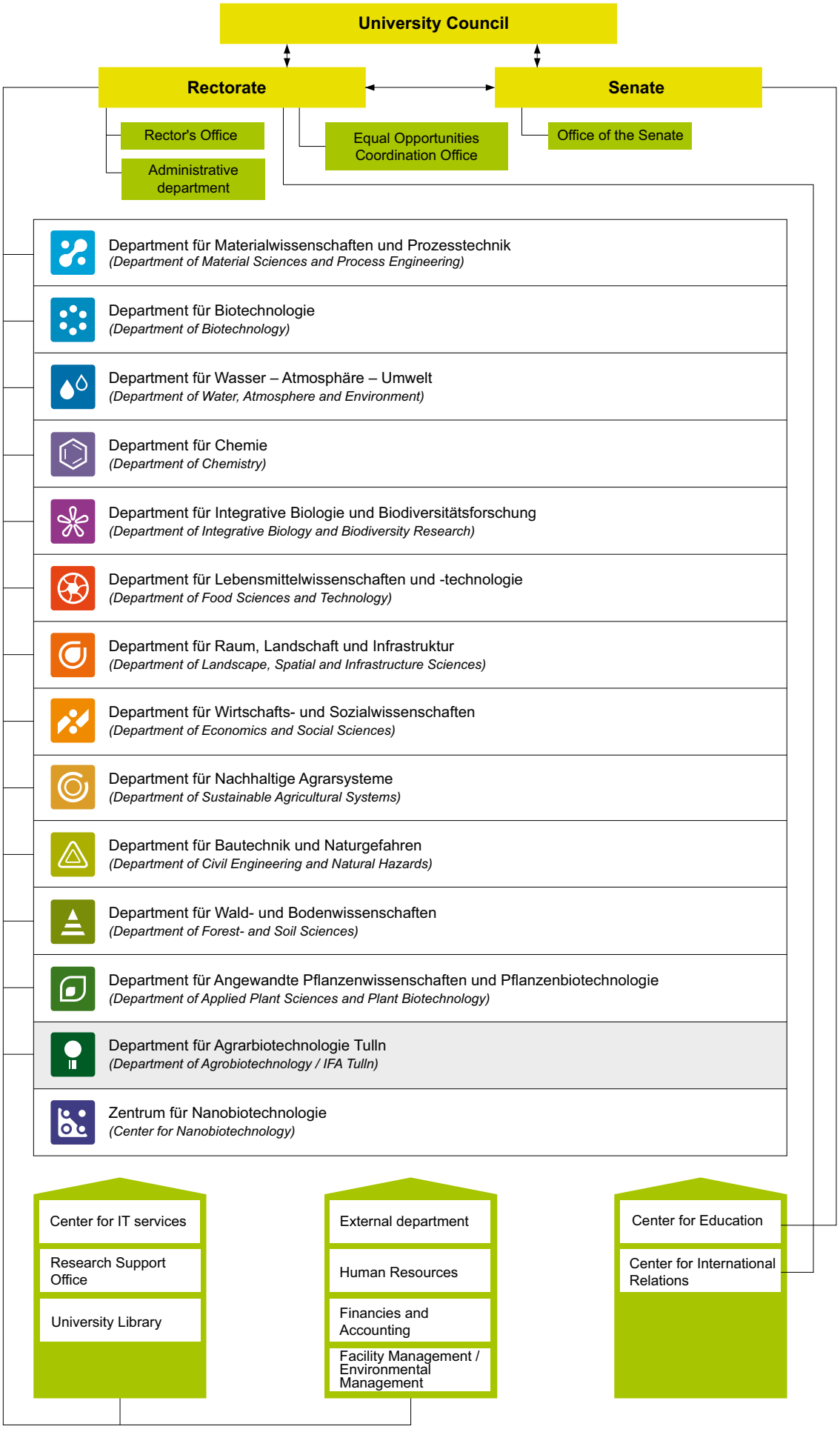


Figure 1

Organisational structure of BOKU

Rectorate. For this purpose, the departments are integrated in BOKU's overall strategy with independent competitive research, they guarantee attractive study programmes and are active within their competencies in the service sector.

Research is conducted in small units that are integrated into the department strategy, while maintaining their specific identity. In order to allow the internal structure to react to changing requirements and newly emerging data the institutes, departments and working groups are not included in the organisational structure and may be adapted on a need basis (merging, resource distribution). Such changes in the internal structure are to be performed by the department within its own competency; approval is subject to the Rectorate, who may introduce respective proposals. Other service boards are to be informed.

Each of the following departments is managed by a department head and generally consists of several subunits (institutes, departments). Further links on subunits and key information regarding education and research, as well as staff, special departments etc. for all departments can be found at:
www.boku.ac.at/departments.html?&L=1

The following departments and centres are currently established at BOKU:

- Department of Chemistry
- Department for Biotechnology
- Center for Nanobiotechnology
- Department of Water, Atmosphere and Environment
- Department of Integrative Biology and Biodiversity Research
- Department of Landscape, Spatial and Infrastructural Sciences
- Department of Civil Engineering and Natural Hazards
- Department of Material Sciences and Process Engineering
- Department of Forest and Soil Sciences
- Department of Sustainable Agricultural Systems
- Department of Applied Plant Sciences and Plant Biotechnology
- Department of Agrobiotechnology (IFA-Tulln)

Service units

The university management and scientific departments of BOKU are assisted by various service units that were founded either in response to the implementation of the University Organization Act 93 such as the Research Support Office and the Center for International Relations, or emerged from the former "Central Administration" as autonomous service units that have developed following the restructuring process. The requirement was to create streamlined, service-oriented structures with clear tasks and responsibilities. Relevant changes include elimination of the university management and strengthening of departments, as well as merging all computing systems within the Center for IT services (BOKU-IT). An overview of all BOKU service units can be found at:
www.boku.ac.at/nicht-wiss.html?&L=1

Between March 2005 and March 2006 the project "BOKU service units. New challenges and organisation" took place. Changes induced as a result of the Universities Act 2002 involved particularly for university service units new tasks. The goal of the project was to effectively develop further service for departments and students, to support education and research more intensely through clearly structured task delegation and transparent processes, and to furthermore strengthen the self-image as an internal service provider.

The following central service units have collaborated in the project: Research Support Office, Library, Central IT services, Center for Education and Vice-Rector for Education, Facility Management, Financial Department and Human Re-

sources, Rector's Office and Controlling. During the first project phase, the status-quo was assessed. The department heads were asked to list tasks of their organisational unit and need for action according to their point of view.

Subsequently, the project team, consisting of the heads of the service units, planned and implemented necessary changes. Meetings were held on a regular basis, where aside from internal voting, a common perspective of service culture, as well as team and project management were discussed.
As of October 2005, a new structure was implemented. Additional project results include the spatial integration of service units, institutionalisation of regular department meetings, concentration of IT services within the Central IT services, establishing of external funding processes at the Research Support Office, redefinition of the structure of the Center for Education and introduction of "BOKU Insight", a magazine for internal communication.

The project helped to achieve many goals, but many objectives are still to be accomplished. Internal service units can only optimally assist if they are continuously developed further. For this purpose, dialogue and co-operation have to be established with all parties.

Locations

BOKU has currently premises in three locations:

– Türkenschanze, Vienna
– Muthgasse, Vienna
– IFA-Tulln, Tulln

In the coming years, BOKU shall be developed further, also in terms of spatial development of its individual locations. The objective of this profile development is to identify strengths and develop them further, in order to safeguard and improve BOKU's performance within research, education and services. For this development, adequate resources are indispensable.

For BOKU in the coming years two projects within infrastructure will be relevant: establishing the Technology Center for Biopharmaceutical Technology Muthgasse and the University Research Center (UFT) in Tulln. The Center at the Muthgasse location shall contribute to successfully develop further the BOKU key competencies of biotechnology, nanotechnology and food stuff- nutrition – health – which is also supposed to strengthen Austria as a biotechnology location.

As a result of the responsibility towards its staff, BOKU does not want to give premature statements regarding the expansion of the location in Tulln. The BOKU Rectorate has established different working groups focusing on the topic of Tulln. Currently, there are no corresponding results yet available. However, BOKU intends on reporting on said decisions in terms and orientation in its next sustainability report.

The tasks of the university

BOKU is recognised as a legal entity in public law in accordance with §4 of the Universities Act 2002. §3 of the Universities Act 2002 determines the tasks of the university, whilst §5 of the same Act states that the Act applies to BOKU. In accordance with §3, BOKU must fulfil the following tasks:

- Development of the sciences (research and education)
- Education through science
- Scientific professional development, qualification for professional activities involving scientific knowledge and methods, and scientific education to the highest levels
- Development of and support for the next generation of scientists
- Continuing education, in particular catering to university graduates
- Coordination of scientific research and education within the University
- Support of national and international cooperation within the fields of scientific research and teaching
- Support the use and implementation of the fruits of research and the integration of these into society
- Promote equal opportunities for men and women and affirmative actions for women
- Maintain contact with graduates of the university
- Promote public awareness of the university's role and achievements

Research and education are the central pillars of the university. The Intellectual Capital Report Act stipulates a reporting structure for universities which results in comprehensive analysis and presentation of their human, structural and relational capitals, their core processes, as well as their output and impact.

BOKU has defined, in addition to these legal requirements, a third core process of "societal and economic development", under which heading the above named tasks (e.g. transfer of results into practical effects, public information) are described. Full details will be given in the next chapter, in keeping as far as possible with the model adopted for the intellectual capital report.

Accounts

BOKU's accounts are produced by the finance and controlling department and audited by the firm BdO Auxilla Treuhand. Implementation of the Universities Act 2002 means that the financial records of BOKU, as of other Austrian universities, are, from 1 January 2004, subject to the provisions of commercial law. The accounts for the University of Natural Resources and Applied Life Sciences, Vienna as reported on 31 December 2005 can be seen on the internet at *www.boku.ac.at/948.html (selected figures are given in Table 1).*

Table 1

An example of budget indicators as reported on December 31 2005

(in €)

	2005
Revenue from global budget funded by the government	72,567,216.09
Tuition income	3,339,216.54
Research income	18,241,522.98
Expenses for tangible means	2,041,565.91
Salaries	45,952,276.37
including refunds paid to the government for public servants assigned to the university	16,620,914.00

BOKU had a balance sheet total of approx. 57.30 million euro on 31 December 2005. Of this, approx 23.96 million euro were fixed capital and some 25.16 million euro liquid assets. The uni-

versity's equity amounted to 20.00 million euro (2004: 21.71 million euro); accruals amounted to 13.66 million euro. Liabilities amounted to approx. 23.64 million euro; some 5.01 million euro can be deducted from this as payments received for research projects and a further 5.21 million euro as being liabilities arising from deliveries and services rendered.

BOKU's operating costs in 2005 amounted to approx. 99.70 million euro (2004: 95.86 million euro). Major outgoings were those for staff (57.42 million euro) and materials (38.30 million euro, of which more than 60% was spent on the rental and operation of buildings). Depreciation amounted to 7.04 million euro in 2005. The result from ordinary activities was negative at -1.58 million euro; 2004 saw a profit of 0.61 million euro. The negative financial result arises from the use of state funding; it should be noted, however, that capital assets rose by 0.30 million euro in comparison to 2004. Profitability in accordance with §27 is positive with a yearly profit of 0.185 million euro, as it was in 2004 (0.716 million euro).

Staff

As of 15 October 2005, BOKU had 1,804 full and part time employees. It should be noted that when comparing this figure with that given in the intellectual capital report 2004 that in 2005, in accordance with the Intellectual Capital Report Act, tutors and assistant lecturers have also been included *(Table 2, page 53)*. This explains why the 2005 figure is so high in comparison to that from 2004 (1,297): this latter does not include tutors, assistant lecturers and those employed under §26 of the Universities Act 2002. In 2005, 42.9% of all employees were women. Further details regarding the staff of BOKU can be found in the chapital entitled "Intellectual capital".

Milestones on the road to creating the "Responsible University"

The University of Natural Resources and Applied Life Sciences, Vienna is an institution with a national and international reputation and is one of the top educational institutions of its kind in Europe. As a "Universität des Lebens", BOKU sees itself as having the task of ensuring vital resources for future generations, making sustainable use of natural resources by respecting the connections between nature and technology and caring for the aesthetics of the landscape.

From its first years in the 19th century, BOKU has focused on sustainability. The principle that "only so much wood should be taken from the forest as grows there" has been a cornerstone of the development academic programmes and of our research activities. We will now discuss some of the measures we have taken towards this end in the past ten years *(see Figure 2)*.

1994 saw the birth of the Copernicus University Charter for Sustainable Development, "to support European universities on their way to a sustainable development". The Austrian universities – including BOKU – became signatories to the charter in August 2002. It covers issues including voluntary commitments, environmental ethics, continuing education for employees, interdisciplinary work, knowledge transfer, network building, partnerships, continuing education and technology transfer.

In 2002, BOKU was awarded recognition for the first time of its participation in the Vienna Ökubusinessplan's ECOPROFIT scheme. This initiative saw many ecological improvements being targeted at BOKU. The efforts of BOKU were recognised again each year from 2003 to 2005.

2005 saw the first publication of BOKU's intellectual capital re-

port (for the year 2004), an instrument to allow the targeted presentation and development of the intellectual capital of an organisation. This was the first such report to be written by an Austrian university (in accordance with the Universities Act in 2002) and also the first worldwide to be written to a regulatory standard. In connection with this, BOKU has also developed the "Responsible University" concept, based on the university's three core processes. To the two traditional tasks of education and research is added a third: the structured contribution to societal and economic development. The first BOKU intellectual capital report is a first step in this direction and a way of taking stock of the situation as regards intellectual capital.

In 2005, the "Platform for Sustainability" was founded, with all key departments of BOKU being represented. The main task of the platform is to support the efforts being made in the univer-

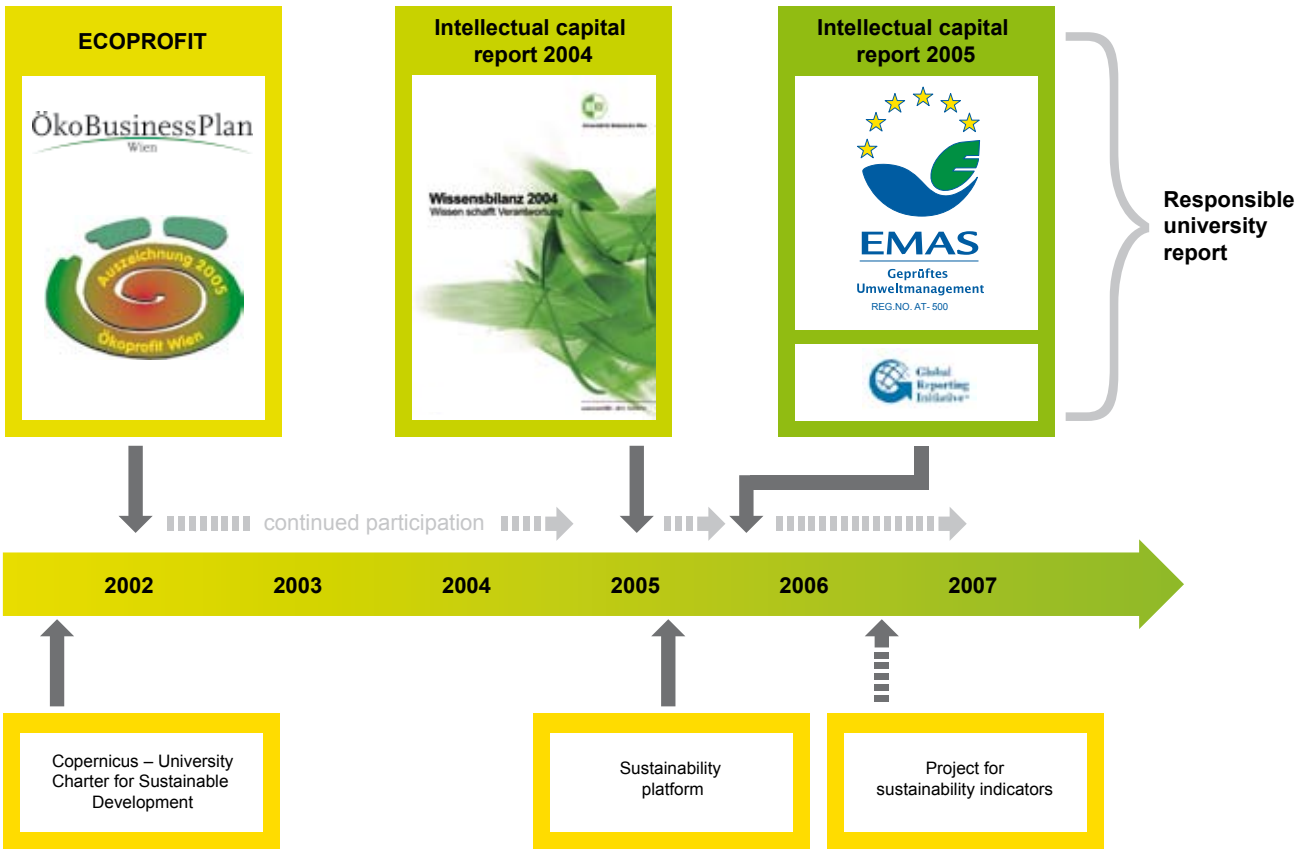


Figure 2

Milestones achieved on the way to becoming a "Responsible University"

sity towards sustainability in all areas.

In mid 2005, an environmental management system began to be put in place as a part of the EMAS project. This is an important step building on the environmental measures taken in the course of the ECOPROFIT scheme and is a way of embedding environmental protection firmly within BOKU's processes. BOKU was the first Austrian university to take part voluntarily in the EMAS scheme.

In 2006, a research project was started which aims at the development of sustainability indicators for universities and is intended to help present the sustainable development of BOKU is a more transparent way, by means of key indicators.

In June 2006, the Rector of the University of Natural Resources and Applied Life Sciences, Vienna signed the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers, published by the European Commission the previous year. The full document can be seen on the web page of the European Commission *(http://ec.europa.eu/eracareers/pdf/am509774CEE_EN_E4.pdf)*. BOKU will in the medium term implement those aspects of the guidelines which remain to be dealt with, integrating these step by step into the internal processes of BOKU.

In summer 2006, the "Responsible University" BOKU published for the first time the present sustainability report, "Committed to Sustainability", which combines the intellectual capital report 2005 and the validated environmental information of the present document. This report meets the requirements of the Global Reporting Initiative (GRI).

What is EMAS?

The acronym EMAS stands for Eco-Management and Audit Scheme. EMAS is a voluntary instrument based on the European EMAS regulations and the national environmental management regulations. It has been open to all organisation and public institutions since 1995.

The aim of EMAS is continual improvement organisations' environmental protection, by means of:

- design and implementation of environmental management systems;
- a systematic, objective and regular evaluation of the performance of these systems;
- informing the public and promoting a dialogue with other interested groups concerning environmental protection; and
- the active engagement of staff in the organisation and adequate educational measures to enable them to contribute to these tasks.

EMAS helps to deal with ecological and economic weak points, to reduce material and energy consumption and through tha to save costs. EMAS is thus an efficient instrument for the implementation of environmental protection measures.

The organisation issues an environmental statement which is aimed at the public. If the organisation fulfils all the EMAS criteria (this is approved by an independent officially accredited verifierer), the organisation will be listed in the official register of the Federal Environmental Agency and has the right to use the EMAS logo, which is recognised across Europe.

In order to take part in EMAS, an organisation must:

- carry out an environmental review;
- implement an environmental management system covering all requirements specified in the regulation;
- carry out an internal environmental audit:
- provide an environmental declaration;
- have the environmental review, EMS, audit procedure and the environmental declaration approved by an accredited EMAS verifier; and
- send the validated statement to the EMAS Competent Body for registration and make it publicly available.

In order to remain registered with EMAS, an organisation must continue to carry out environmental audits, update the data in the environmental declaration annually and, at the latest 36 months later, have all the components required for the EMAS registration re-approved by an accredited environmental verifier.

Management systems

Autonomy, new structures and competition require not just strategy and profile building efforts. Their implementation also requires a series of new planning and management instruments. These instruments are what make up the BOKU management system. The aim is to promote the principle of subsidiarity, support management personnel in their decision-making and free researchers and university teachers from administrative tasks.

The most important of BOKU's internal management instruments are the target agreements, which were reached with all departments and the Centre for Nanobiotechnology for the first time in 2005, on the basis of the development plan. The most important of BOKU's external management instruments are the performance agreements reached with the Ministry, performance reports, the intellectual capital report and the accounts.

Intellectual capital report

The intellectual capital report, first published by BOKU in 2004 *(http://www.boku.ac.at/6044.html)*, plays a double role in the performance and target agreement process. On the one hand, it serves as a monitoring instrument for the performance agreements in accordance with the Universities Act 2002 (between the Ministry for Education, Science and Culture and the university) whilst, on the other hand, indicators defined in the intellectual capital report contribute, together with the aims given in the "strategic goals", to BOKU's internal target agreement process (between the Rectorate and the departments).

Planning and management

In order to efficiently carry out these new planning and management tasks, BOKU has begun to put in place a coherent management system, based on the "balanced scorecard" system. The task now is to implement this new system. The new reporting mechanism disseminates the information required for success and good management to the right people, in a form which allows comparisons to be made. Comparisons between targets and achievements allow answers to be given to questions regarding the progress that is being made towards these targets.

To allow the data required for management to be continuously gathered, a central, dynamic data warehouse (DWH) has been put in place. This is linked to BOKU's data systems such as the research databank, the BOKU educational information system (BLIS), SAP etc. Exchange of data between the systems, as well as strategic analysis, will be strengthened in the medium term by the DWH at the level of both the university management and of the departments.

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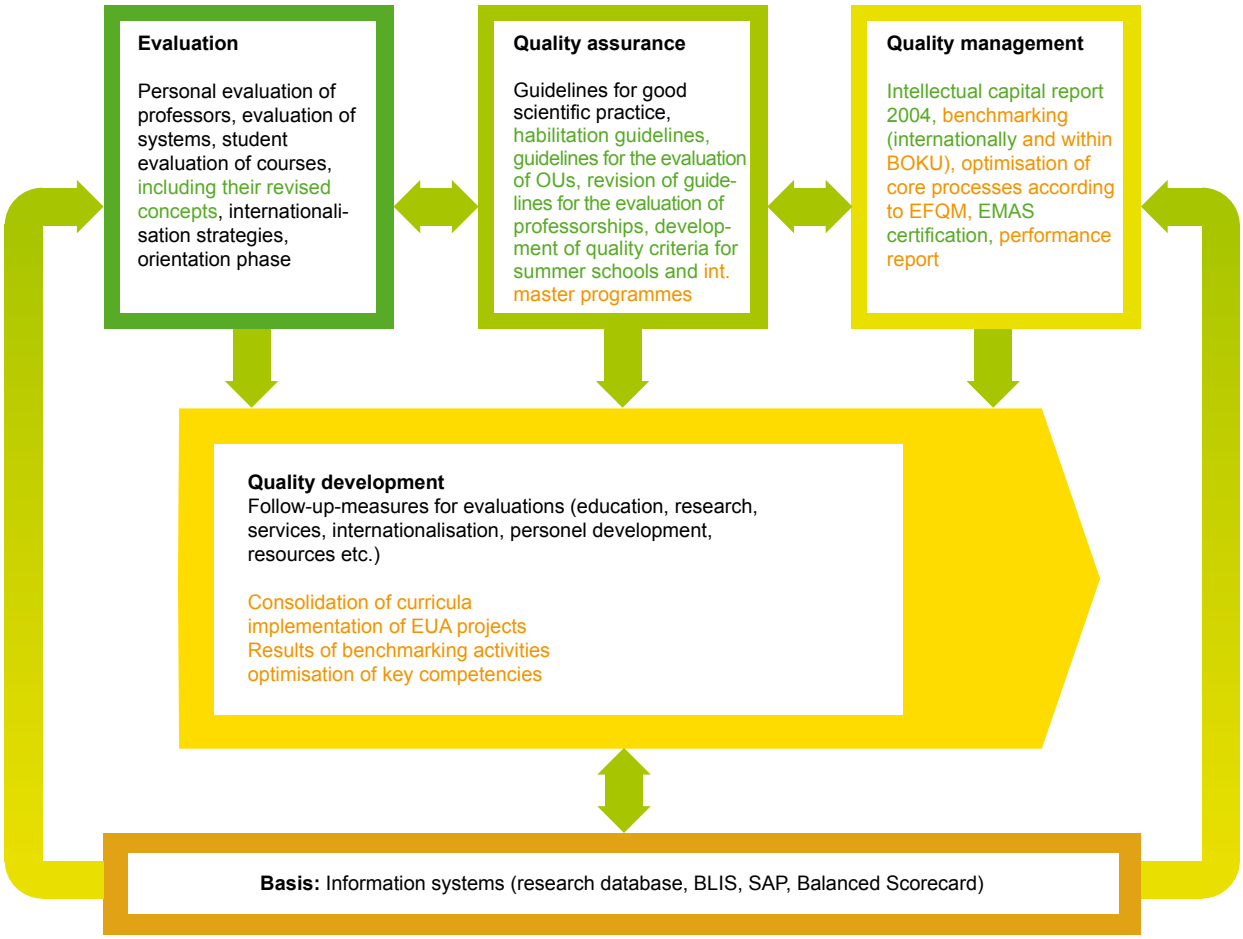
Audits and project support

BOKU continues to meet its obligation to make proper use of the funding provided by the European Commission for targeted projects. To this end, BOKU invited bids in 2004/5 and then appointed the accountants Moore & Stephens as external auditors. All research projects in the Sixth Framework Programme will be checked to ensure that funding is being made proper use of. BOKU chose this firm with a view to optimising the external funding acquisition process at EU level. BOKU has succeeded *(see chapters entitled "Core Processes" and "Output and Impact")* in acquiring a relatively large number of EU projects and thus EU funding, relative to both its level of third-party funding and to other Austrian universities

In addition, all projects proposed by BOKU researchers must, since 2004, be reported to the BOKU Research Support Office. This latter verifies all new projects for formal correctness, so that researchers' efforts are not at risk of being wasted as a result of errors in their application. Furthermore, BOKU's Research Support Office is involved with working with other service providing departments in order to optimise the external funding process.



Black: was performed before 2005 or is continuously performed
Green: Performed for the first time in 2005
Orange: planned

Figure 3

BOKU's quality management system model

Quality assurance and quality management

The aim of BOKU's quality management system *(see figure 3)* is to develop a quality culture which encompasses all areas of activity, to ensure the continuing development and optimisation of evaluation procedures and quality assurance mechanisms, and to optimise the internal organisational and decision-making structures, so that a contribution can be made to increasing autonomy. The BOKU quality management system can be presented in the following way:

When the intellectual capital report 2004 was produced, it had already been determined that the intellectual capital report was to be an important part of BOKU's quality assurance process, allowing results from the evaluation process to be made use of in the intellectual capital report, the performance agreements and the target agreements *(see Figure 4).* The targets formulated in the course of considering the intellectual capital report as well as the requirements arising from the target and performance agreements feedback in turn into the evaluation process. This allows continuous, multistage evaluation processes (Multistage Evaluation Procedure as internal quality assurance system) and the intellectual capital report to be integrated and thus create an annual monitoring and strategic communication system which, in a transdisciplinary way, extends beyond the boundaries of the scientific community towards all stakeholders.

Measures were taken in 2005 above all in the following areas:

Course evaluation

The system of student evaluation of courses, which BOKU was the first Austrian university to introduce, was thoroughly overhauled in 2005. Alongside questions which apply to all types of university courses, specific questions were introduced which deal with features particular to each type of course. Furthermore, students are now asked twice for their opinions (e.g., after one third of the course is completed and then again after the final examination). Finally, the system is being made electronic.

Evaluation of organisational units

In 2005, guidelines were developed for the evaluation of organisational units or departments, taking into account the standards set out by the DeGEval – Evaluation Society and the guidelines of the ENQA. After approval by the Senate, a first step is planned for 2006 with the evaluation of the Department of Biotechnology. All departments are to be evaluated within two performance agreement periods.

Person-based evaluation

The guidelines agreed on by the Rectorate of the University in the 2004 calendar year for personal evaluation of professors were first applied in 2005. The Professor of Resource-orientated Construction and the Professor of Animal Breeding and Population Genetics were evaluated internally and externally. Both professorships were then able to be extended. These evaluations also allowed the procedure itself to be further developed and refined.

Euro League for Life Sciences

The Quality Assurance Support Group, coordinated by BOKU, carried out in 2005 a successful pilot project in the field of "Environmental Sciences". This involved the development of quality assurance measures within the framework of a summer school, whose transferability to international master's programmes is to be considered in a further step. The provision of an overview of personnel development programmes in the fields of education and learning to all ELLS partner institutions represents the basis for the development of minimum standards in this field.

Ensuring good scientific practice

The honesty of scientists is an essential condition for scien-

tific activity's maintaining a high ethical position within society. Despite the often-held opinion to the contrary, dishonesty in research runs contrary to the spirit of scientific endeavour and to the scientist's responsibility to society. There are no rules which can substitute for honesty. The University of Natural Resources and Applied Life Sciences, Vienna has attempted, however, to set in place the conditions to allow good scientific practice to flourish by means of the guidelines entitled "Ensuring good scientific practice". These are intended to prevent, as far as is possible, dishonest behaviour and to ensure an appropriate response when such behaviour does arise.

The Senate of the University of Natural Resources and Applied Life Sciences, Vienna agreed on the guidelines at the beginning of 2004 as a provisional part of the university's statutes. The start of 2004 also saw the setting up of the regulatory office (Ombudsstelle) to endure good scientific practice at BOKU. Its purpose is to ensure a minimum standard of behaviour, prohibiting scientific malpractice. The regulatory office is made up of three BOKU professors, one head and two deputies. They are available for consultation to all staff at BOKU who wish to draw attention to possible scientific misconduct. The guiding aim is to protect the dignity and good reputation of all involved. The

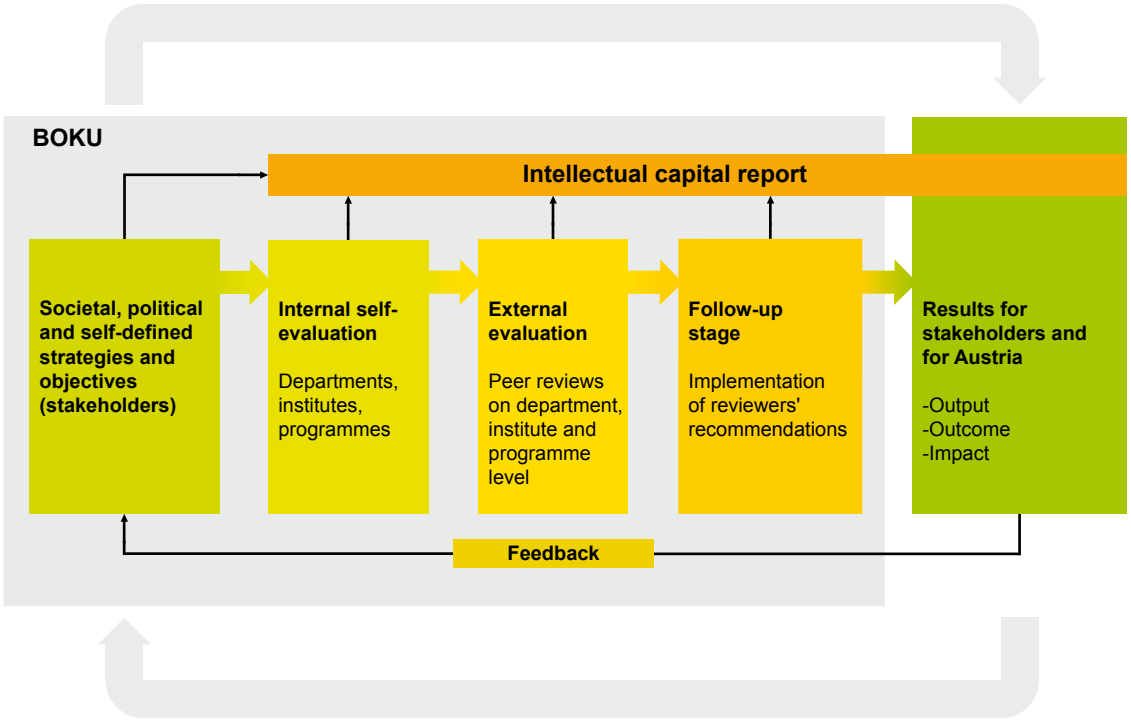


Figure 4

Integrated university performance and quality assurance system

guidelines can be seen on the BOKU website at *http://www.boku.ac.at/uploads/media/Guidelines_ombudsstelle_01.pdf*

Establishing the Office of Quality Management

In the course of the restructuring of the internal service units, it was decided to establish the Office of Quality Management, which reports directly to the Rector and which is responsible for evaluation, quality assurance, quality management and quality development. This office will in future coordinate a platform within BOKU.

Intellectual Capacity within a system – the BOKU value creation model

Through the intellectual capital report, knowledge inventories and flows within BOKU are made transparent. Within a set of reference points, the non-material assets are represented using indicators. The interconnections between these indicators, particularly achievements and developments, are interpreted and described. With its intellectual capital report, first presented in 2005, BOKU was the first Austrian university to create year-on-year comparisons of a majority of these indices and to interpret them.

Presenting all the individual knowledge and all BOKU's experience carried over from many years, would exceed the scope provided by the intellectual capital report 2005. This report attempts to create an overview of BOKU's key achievement profile.

The process model *(see Figure 5)*, first published in the 2004 intellectual capital report, forms the basis of the 2005 intellectual capital report. This model depicts the cycle of knowledge-based value creation over time. In the following chapters, all aspects of the process model are represented in detail using a range of intellectual capital indicators.

The following example may serve to shed light on the model of the BOKU "Responsible University": A working group from BOKU is engaged in a research project. The employees (human capital) involved need to undertake the project the necessary infrastructure of the organisation (structural capital), cooperate with strategic partners (relational capital), are involved in developing new knowledge (core process of research and development) and this research-led knowledge is passed directly on to students (core process of education and continuing education). In this way new knowledge comes to fruition in the form of publications (output and impact of the core process of research and development), theses and degrees are in this way completed (output and impact of the core process of education and continuing education). Finally, this creates the preconditions for new solutions to problems or new products or contributes to the transfer of knowledge to society or citizens (core process of societal and scientific development and output and impact). As well as these results, there are also the financial means, which appear in BOKU's financial reports.

Knowledge goals and intellectual capital

The processes involved in acquiring, using and assessing knowledge start with a definition of the goals of knowledge, which are derived from BOKU's business' strategy. These form the basis for using BOKU's intellectual capital which itself consists of human, structural and relational capital. People occupy a central position in this. For and with people BOKU is developing a creative and innovative environment (structural and relational capital) which aims to attract the best minds in scientific research within BOKU's fields from around the world. Using these non-material assets, which themselves need constant further development and attention, operational work is carried out on these projects to create value. In this respect, there are many "switching effects" and knowledge transfer effects, which are part of the unique character of BOKU's "Responsible University". Therefore, these knowledge goals in the intellectual capital report 2005 are extended to include BOKU's environmental responsibility (business ecology).

Core processes

The three core processes – education and continuing education, research and development as well as societal and scientific development – are presented in the BOKU competence spectrum which includes the following areas of competence: Land and land eco-system management: water – atmosphere – environment; living space and countryside; plants, renewable natural resources and resource-orientated technologies; foodstuffs, nu-

trition, health; biotechnology and nano-biotechnology.

With regard to education and continuing education, BOKU is offering a comprehensive, inter-disciplinary based study programme to develop further generations of scientists, as well as provide leaders for the private and public sectors. Orientated to high standards of quality, which are constantly being developed further, knowledge is passed from the teaching staff to students in a positive manner when compared to the whole of Austria. BOKU is the first Austrian university to implement completely the three elements of the Bologna system in its list of academic programmes offered. BOKU maintains intensive contacts with universities and research institutions across the globe with regard to the mobility of its teaching staff and students. It is increasingly focussed on countries in South and Eastern Europe as well as developing countries in Asia, Africa and Latin America.

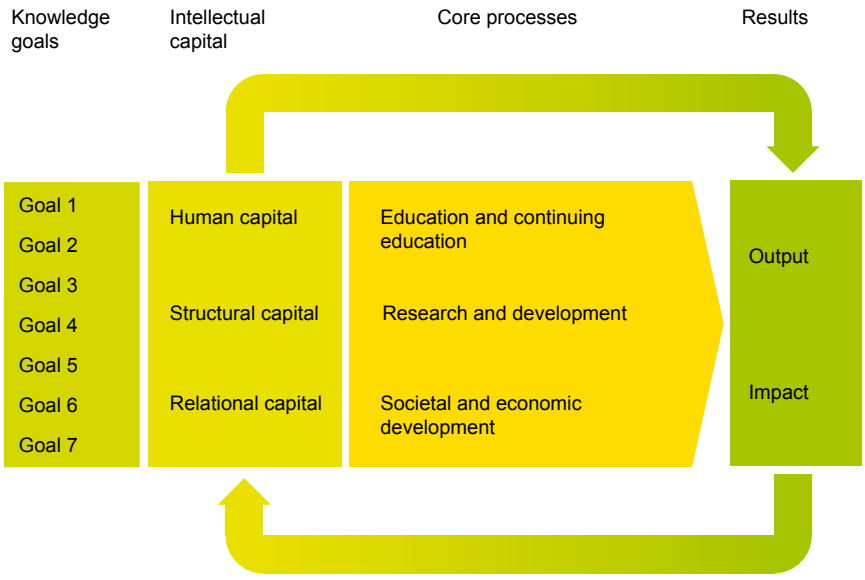


Figure 5

BOKU's intellectual capital model

In respect of research and development, BOKU is carrying out results-orientated research across the medium to long term, which is for practical use. In addition, research is being carried out as pat of a long-term co-operation with businesses in the form of competence centres, Christian-Doppler laboratories and other firms. This research is focussed on practical application and prior to it becoming competitive in order to develop new competencies and solutions to be applied in the economy. Research is highly inter-disciplinary in nature and is focussed on the daily activities of highlighting the interrelationships and interferences of entire process chains. Research platforms and centres are temporarily created according to requirements in order to institutionalise subject-related work across spanning different specialist areas. There is a greater focus on dialogue in order to meet the need of politicians and citizens to enter into a discourse on the meaning and application of research results in society.

The third core process of the BOKU "Responsible University" – the societal and economic development – includes all those activities, which BOKU contributes to creating societal and economic added-value for Austria and Europe. Well trained and highly motivated scientists form the key assets of an innovative and scientific place. A solidly scientific and professional qualification creates the pre-condition for a further career in research as well as employability in the local employment market and elsewhere. BOKU's external relationships are increasingly about playing an active roll, providing targeted communication and offering bespoke services to any interested public, potential customers and other stakeholders. In this service area, services are offered not only to the scientific community but also to other sectors e.g. political advice and scientific transfer activities (knowledge assessment, establishment of commercial entities). Professional PR and communication concepts are developed and deployed in order to communicate and increase the "public understanding of science".

Output and impact

Profit as a financial unit is unsuited for assessing the success of a university's services. Therefore, in BOKU's intellectual capital model, the non-material results and effects were defined which could become relevant initially in the medium-term within BOKU as well as the wider Austrian economy. Usage is achieved from externalities, for example, in the form of knowledge from third parties or ideas put into effect from publications and presentations. A multiplier effect ensues also from the R & D networking between universities and businesses.

The model represents the Status Quo of the development of non-material assets from the previous year. The details found in classic reports are lost with this aggregated representation and the complexity of the BOKU process, created from reciprocal relationships, can only be suggested. The BOKU intellectual capital report is a significant step in showing these interrelationships, which are masked in the normal financial reports, produced annually. On the following pages of the report, all aspects of the model are described, interpreted and explained in detail with the help of indicators.

Additions according the sustainability report

To justify its claims as being the "Universität des Lebens" and the "Responsible University", the model in the intellectual capital report 2005 was consistently developed further. BOKU has therefore extended the intellectual capital report with the key parts of the sustainability report, which were themselves put together on the basis of the international Global Reporting Initiative (GRI). In this intellectual capital report, BOKU reports for the first time on its ecological and social responsibility as the first university, at least in Europe together with an intellectual capital report. Both areas are a part of its responsibility to society as well as generations to come.

If BOKU wishes to report faithfully on its employees, it must account for its social responsibility towards its own employees and formulate a set of goals (human capital, prospects). In response to the question of where BOKU researches derive their research questions, apart from the classic “freedom to research”, one of the many possible answers is that new areas of research result from economic requirements or the state. Communication is required to recognise these needs. Consequently, from BOKU’s perspective, it is not enough to pay for co-operation agreements and to comment on these but dialogues with the various partners are also required. The who and the how are parts of this report (relational capital, core processes and output and impact).

All new parts of the report which come from these requirements are treated as separate parts of the report but are integral parts of the intellectual capital report, in particular of the core processes of societal and economic development. To provide the interested reader and readers devoting energy and commitment to the subject, with special access, there is an appendix to the GRI BOKU guidelines which contains sections on the GRI subjects with parts from the intellectual capital report and references to the respective chapters and their page numbers. Ecological responsibility for BOKU means being accountable to society for the financing awarded to it and using them in a resource-conserving manner as well as finally ensuring a minimal burden on the “BOKU” environment and, for example, carrying out acquired research projects. To this end, BOKU has in 2006 become EMAS certified.

This means that ecological responsibility, which is primarily aimed as business ecology, is represented in environmental indicators. The use of paper, water and energy use, cleansing vehicle emissions, waste management etc. Interviews, discussions with stakeholders and testimonials also form part of this claim. Social responsibility for BOKU means not only in its dealings with all employees on all levels of the university but also in dealing with various groups in society, in particular during co-operation with partners from developing countries to find solutions to problems in these countries. Social and ecological responsibility is also discussed in this intellectual capital report with various stakeholders but also documented using indicators ■

2

The Performance

BOKU's strategic knowledge goals /
Communication with stakeholders /
The resources of the "Responsible University" /
The core processes of the "Responsible University" /
Sustainable results of the "Responsible University"

Goals with responsibility – BOKU's strategic knowledge goals

Knowledge goals serve to determine the areas in which specific competencies, structures and relationships are to be developed or strengthened in order to further the implementation of the university's strategy. Knowledge goals correspond to the long-term "organisational goals" and, together with the financial goals, make up the framework for the development of BOKU.

Systematic connections shape societal and economic reality and developments. Linear prognoses are thus increasingly seen to be impossible and futile. The knowledge goals are therefore confined, in the medium- and long-term, to setting broad parameters for the university's development. This in turn creates the space in which the organisation can evolve.

The function of knowledge goals is to put in place the framework in which innovation and creativity can thrive. This encourages new discoveries and the passing on of these through teaching. The goals are transmitted through the BOKU management system in the form of selected performance indicators, allowing them to influence the internal target agreements reached between the departments and the Rectorate. This provides the clarity, which allows the steady progress being made towards the targets to be measured over the course of the year.

The commitment to sustainability in BOKU's mission statement means that sustainability must be integrated into all of its central functions. That means that the conditions must be put in place to allow sustainability to be institutionally imbedded (sustainability made possible), to be integrated into research, education and external service provision (sustainability made visible) and to be allowed to become a self-evident part of all daily activities (sustainability as a way of life).
In keeping with its mission statement, BOKU is committed to participate actively in the protection of the environment. This is evidenced in our environmental management system and our participation in EMAS. It is thus a logical step forward to define a new knowledge goal: ecological responsibility.

Knowledge goals 2005

Knowledge goal 1: Knowledge for sustainability
BOKU wants to use a systematic approach to research, research-led teaching and problem solving to make a key contribution to the understanding and responsible shaping of the interactions between ecology, economy and society.

Knowledge goal 2: Education as motor
As a motor of societal development, BOKU wants to create professionals with excellent educational backgrounds, thus making a substantial contribution to Austria's development and position as regards regional competitors. The knowledge of the staff and graduates of BOKU should enable it to lead the way in anticipating future scenarios and to take a leading role in controversial areas of the economy, politics and society.

Knowledge goal 3: Connectedness as a foundation
International competition and connectedness create the conditions in which the creation, replication and evaluation of knowledge can be carried out at a high level in an international way. BOKU seeks to make use of these possibilities and to play an active role in research, education and societal and economic development.

Knowledge goal 4: Taking advantage of communication and innovation

Accumulated knowledge is made use of in the course of its application to individual, cultural and economic development. BOKU seeks to use enhanced communication with all social actors and innovation systems to make knowledge understandable and available for use in a targeted way.

Knowledge goal 5: Staff as a valuable resource

Career development in a modern academic organisation takes place on three levels: research, education and management. BOKU seeks to create the conditions to allow each member of staff to follow their individual, chosen path in the best possible and most gender-fair way.

Knowledge goal 6: Leaning for the future

The demographic shift occurring in industrialised countries is leading to a fundamental process of societal change, which is impacting the availability and instruments of educational opportunity. BOKU seeks to be an essential provider of made-to-measure educational provision in the Austrian tertiary sector in its fields of competence.

Knowledge goal 7: Ecological responsibility

A university dedicated to the issue of sustainability must seek to make ecological responsibility key to its own processes, making environmental protection a principle which all of its members of staff act upon internally and communicate to the outside world.

As a logical extension of many years of involvement in environmental issues in the fields of research and education, the introduction of the EMAS (Eco-management and Audit Scheme) environmental management system has allowed attention to be focussed on the BOKU's own internal processes. Essential to the continuous improvement of environmental performance is a functional environmental monitoring system. This includes regular collation of input-output and wastage data, the analysis of which allows monitoring of environmental impact and regular supervision of the implementation of the environmental programme.

In this way, BOKU is meeting its social responsibility as the first Austrian university to have an EMAS-certified environmental management system. In the mid- to long-term, BOKU hopes to be able to act as an advisor, catalyst and benchmark partner for other research and public organisations with similar interests. BOKU hopes that in this way it will be able to encourage other organisations to follow its lead.

Communication with stakeholders

BOKU has a long tradition of communication with its stakeholders both in Austria and internationally.

With this present report, the university is taking a step further and seeking to inform its stakeholders *(see Figure 6)* about its resources and its associated performance in all its key fields of activity: research, education and societal and economic development. The information we are providing greatly exceeds what is demanded by the Intellectual Capital Report Act. In particular, we are reporting on how we are meeting our social and environmental responsibilities.

BOKU's researchers select their research topics based not only on the classic principle of academic freedom but also identify numerous research areas and focuses on the basis of a far-reaching dialogue and intensive co-operation with various partners from the worlds of economics and politics and from the wider society. Many topics arise from consideration of needs in society and daily political events. Because the "Universität des Lebens" sees itself as an open university, many of its students come from abroad (see core processes). This means that the strong international connections of researchers enable issues of European or international relevance to be addressed (e.g. the Millennium goals), often in co-operation with international partners. Without communication, none of this would be possible.

BOKU communicates with its partners at all levels, be it through conferences, meetings, excursions or lectures held in co-operation with other academics or with practitioners. Communication occurs, for example, by means of publication of original contributions to scientific journals or academic works, or in practice-orientated publications, the popular scientific media, radio and television, or through participation in public events such as Science Week, the "Lange Nacht der Forschung" (an evening when researchers present their work to the public), the GeNAU summer school and so on, communicating with school children, students and members of the general public (see Output and impact of core processes).

The BOKU teaching staff takes care to maintain personal contact with their students. It is usual that the staff will know the names of their students by the end of the introductory courses at the latest. BOKU does not leave its students to take care of themselves but rather keeps in constant touch with them by means of "boku4you" and the internet. Nor do we neglect our graduates – we put them in touch with interested companies and training schemes through our "BOKU Alumni" service (formerly known as the Büro für Berufsplanung) (see Output and impact of core processes).

As in the intellectual capital report 2004, the present report includes contributions from BOKU staff members, external stakeholders and international experts. New in this 2005 report is that for the first time BOKU is allowing a staff representative, students and a guest researcher to share their views. This gives new stimulus to the development of the university, in particular with regards how it is meeting its social and environmental responsibilities.

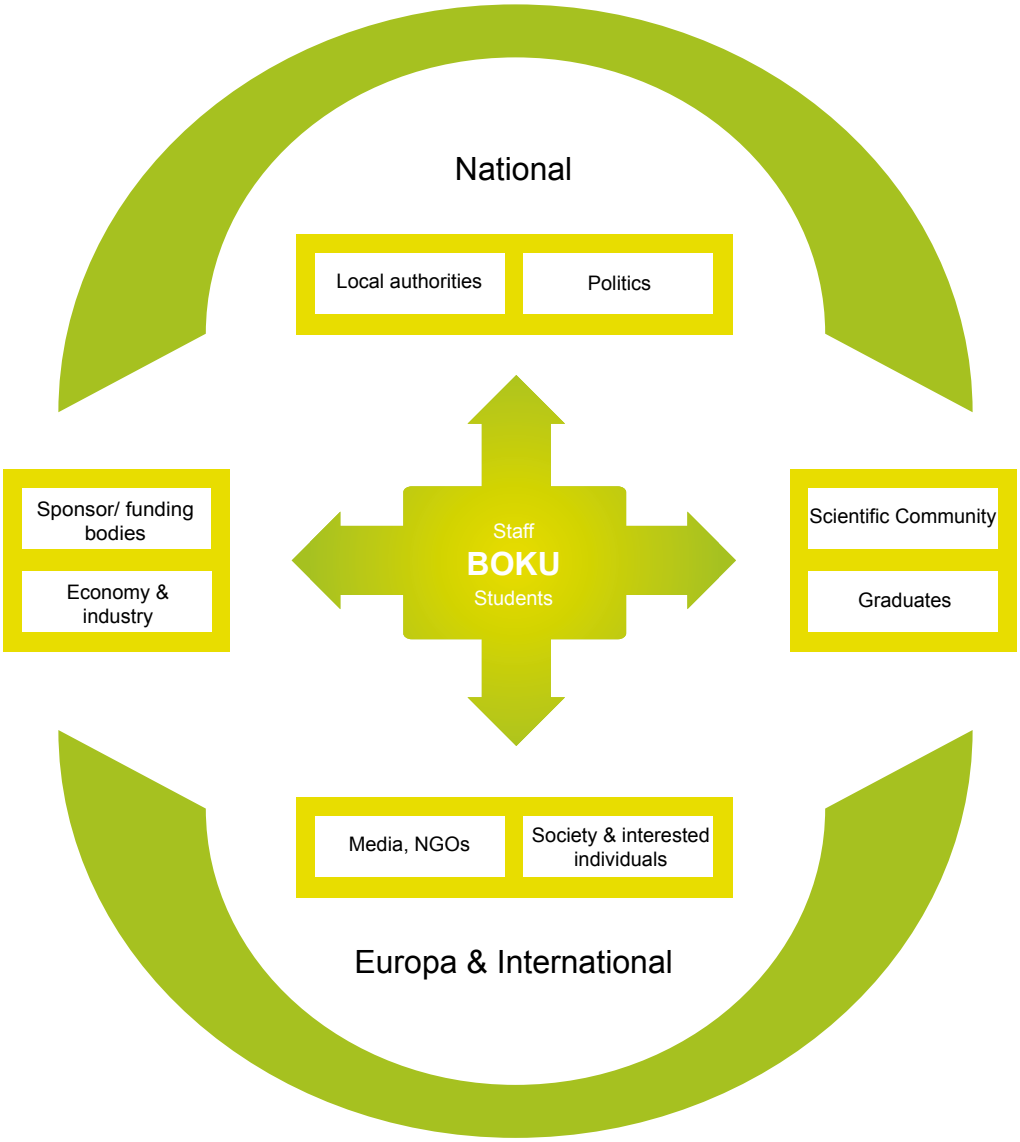


Figure 6

BOKU's stakeholders

Helmut Schüller
University Chaplain
of the Vienna Catholic High School Community, Vienna

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"Knowledge and Conscience must go hand in hand"

The University Chaplain of the Vienna Catholic High School Community, also responsible for BOKU, one-time Director of Caritas and General Vicar has high hopes for the universities. Here, he discusses responsibility, development work and common values.

Key word development co-operation: BOKU staff and students often travel to developing and industrialising countries. What responsibility do they have from the perspective of an ethical thinker?

Schüller: Knowledge and conscience must go hand in hand. The mission of a university must be reflected in what it does. Pure technical exporting delivers nothing if we simply transfer old technologies which are of no use to us. Energy generation is a good example of this. Students need the sensitivity and a view of the big picture so that they know themselves and their place in society.

Are the students equipped for this?

Schüller: If someone is involved in cross-cultural work, then early on they should get an understanding of international law. They should have knowledge of human rights, sustainability and international communication standards as early as possible. Students often come across international agreements or organisations such as WHO, UNESCO or international law very late on. The World Ethos Project could be an important catalyst for this. Students need to understand that the basic ethnic needs of diverse cultures are in fact not very different.

So that this understanding is embedded early on, I can imagine a general introductory lecture for several universities which would give young people a good grounding before they then specialise in different areas. An admirable pluralism of values where everyone is equal is not possible as in this case there would be no need for human rights. The universities would be tasked with finding a minimum consensus and for this, they carry considerable responsibility. Where else should this happen?

I believe that a series of inter-university lectures for international application could also be very valuable.

As the former Director of Caritas, you have yourself gained considerable experience of other cultural traditions …

Schüller: Much of what began in Caritas as catastrophe aid

turned into development work. One pre-condition for development work is to deal with the resources which are available in that country. All projects aim to help people to manage their own lives. Micro-projects such as communal co-operatives and societies are normally the most successful. It is a question of strengthening the democratic forces in each country. To this end, it is also necessary to get involved in one's own democratic society and to participate in one's own politics. For example, it is clear that the EU agricultural export policy destroys markets in Africa. The actual interests of economy are often different from the goals of democracy.

Now we must ask ourselves the question: how can one set the world citizen and world democracy against the sub-system of economy which is no longer under the control of politics? UN General Secretary Kofi Annan has agreed a key set of standards with the large corporations of the world. The corporations have indeed signed these but do not want to cede control. However, it is inconceivable that the economy should be the only global system which exercises control. It must be set against world democracy.

The report contains numerous, partially detailed qualitative interviews with BOKU staff in which they provide information on problems in their research, partnerships and also their hopes for society. So that readers of BOKU's intellectual capital report 2005 wouldn't see as just a "celebratory brochure", BOKU felt it was important that external experts also gave their views on the key tasks of a university at the beginning of the 21st century and their relevance for society. A series of recommendations, also on socio-ethnical responsibility, round off these testimonials.

A round table is being convened as part of the period on this report on the theme "Responsible University – responsibility for a new discourse culture at BOKU" with researchers from BOKU and external stakeholders. It will examine the question of how a university with its staff deals with tricky issues and can enable an open discourse on them. BOKU will continue this form of round table discussion in the future and in doing so, set in motion new impulses, both internally and externally, in particular, to further develop itself as a "Responsible University".

Of course, BOKU wants to further develop its dialogue with its stakeholders. They are welcome to continue an open dialogue with BOKU and to further develop this report, including the issues and recommendations contained within it by giving feedback, especially questions and challenges *(see appendix)*.

Christian Vogl

It was all grandma's fault: Christian was fascinated by the way she grew such beautiful plants from lemon, orange and dates seeds and so he wanted to become a gardener and at one time wanted to do "something in the tropics with plants". For several years Christian was able to spend the summer months before he finished school with a gardener in Mödling helping to take care of vegetables and flowers for retail markets.

This gardener also advised him to study at BOKU. "In those days", if you wanted to study gardening, you first had to complete your studies in agriculture. Christian was so enthused by this intensive study of agriculture e.g. from the practicals, excursions and especially the lectures by Gerhard Plakolm, Wolfgang Holzner and Ralph Gretzmacher that he stayed with agriculture and specialised in tropical farming and biological agriculture.

In the meantime, Vogl has been conducting research for various projects, including some financed by the Austrian Science Fund (FWF), together with undergraduates, PhD candidates and colleagues, on the subject of "practical knowledge from farmers". Knowledge gained from farmers is an important cultural heritage, as well as a potential source of innovations in the area of biological agriculture and resilience: "We are fascinated by IT and everything high-tech. That is understandable. However, we should not forget about academic documents, processes and analysis which come from people who have experience in their daily lives of working with natural resources and their management and have come up with many different innovations. Bio-agriculture was not invented at a university or by politicians but was developed over the course of decades by farmers".

It is up to Vogl and his colleagues to research local knowledge systems. He keeps emphasizing that this is not about romanticizing or idealizing "old knowledge", neither is it about the omnipresent economic exploitation but about fundamental economic knowledge with consideration of the development of resilient agricultural systems.

The subjects he has researched includes the organisation of knowledge e.g. transferring and changing practical knowledge into subjects such as sustained forms of agriculture, local land indicators, the local perception of climate change, the exploitation of types of plants in home gardens or from collections of wild plants, the results and methods of farming experiments or traditional forms of husbandry. Vogl's primary areas of research are in Latin America, Austria and Southern Europe.

Vogl cites an example of one project which was carried out in the local areas of traditional types of culture in Tyrol: "With good reason we are concerned about the reduction in biological diversity. Biological diversity is closely associated with cultural diversity. Hot spots of bio-diversity are also hot-spots of cultural diversity. If we want to protect bio-diversity, we must put energy into protecting cultural diversity and cultural heritage". To this end, one EU-project is underway which uses not only local places but also intensively researches farmers' practical knowledge in the areas of crop growth, progeny, harvesting and usage. In the words of Vogl: "We don't speak about plant cultures and land cultures for nothing!". The interdisciplinary subject means that Vogl has been working for many years closely with the Institute for Ethnology and Cultural Anthropology within the University of Vienna and has been tutoring undergraduates and PhD students.

As Vogl emphasizes: practical knowledge is not only what is stored within the mind, it is also about practical skills, language and social forms of organisation. In his research work in Bolivia, Peru and Mexico, Christian Vogl has discovered the importance of working with and nurturing good relationships with the farmers: "Much of what they know you won't learn from them telling you. It is an unconscious cultural heritage. You will only find it

out if you are actually there on the ground, you see or feel it or you must get involved yourself".

Vogl welcomes BOKU's work on internationalisation, he himself has worked overseas for several years. However, he points out that the conditions and the provision of resources for this must be improved: "Why do guest lecturers and professors from overseas get packs of information and contracts in German? Why is there no pot of funding so that BOKU graduates can send a poster or lecture to an academic conference overseas? We should support what we promote".

For Vogl, the key criteria for teaching staff is above all authenticity followed by the willingness to devote time during and after lectures and seminars to dealing with the students' questions and requests". He is convinced that "this is respected by the students". For Vogl, it is above all important for the teaching staff to have good relations with the students. "Students are neither economic human resources, nor are they distractions. I coach 20 graduates and to a very intensive level because I take time to work with them".

Vogl also has some misgivings: If economic and time pressures continue to increase, then the quality of work that BOKU is renowned and respected for will suffer. That would be a source of regret because "the teaching staff and academics are only good if they enjoy their work. Doing academic work as an exercise in carrying out duties has no value". This father of two divides his time between his family, hobby and his work: his wife is an internationally recognised ethno-botanist who researches the layout and function of farmers' home gardens. They both look after several gardens.

As well as his research, Vogl has also studied music for many years at the music high school (trumpet), speaks Spanish and Portuguese because of his research in Latin America, teaches as a guest lecturer at universities in South America, is a co-publisher of academic journals and has a long list of academic publications to his name. But Vogl prefers simply not to mention these.

Pamela Pali

Pamela Pali comes from Uganda and is working on her dissertation at the Institute for ecological Agriculture. In Uganda, bio-farmers work for export, local markets are supplied with products from traditional farms. “The bio-farmers”, explains Pali “earn more money”. They export vegetables and tropical fruit such as pineapples, mangoes, also sesame and ginger. Twelve thousand farmers produce ecologically grown cotton which is particularly important for this type of plant because elsewhere cotton is produced using high quantities of herbicides. Pali is interested in the extent to which this improved income can bring about social change.

Does this better income in turn contribute to a more careful use of the land and thus to greater sustainability? If the land is to be used in this way by a Ugandan, its success depends on who has advised and taught him. It is of great importance that there is sufficiently well trained specialist manpower.

Pali will shortly return to Uganda for a few months to collect data there, which she will then process back at BOKU. She enjoys the atmosphere at BOKU “I especially like that you can ask a professor for advice whenever you need it”. And “it is so easy to get hold of information here. The internet is much slower at home and the books are older”. In private, she find it more difficult to be accepted “because people are mistrustful just because I have black skin. But that is perhaps because my knowledge of German isn’t so good”.

At BOKU, Pali has chosen subjects which she can use back in her homeland. “It would make less sense for her to study the marketing strategy of the EU”. In Uganda she works with groups comprising only men and groups comprising only women as well as mixed groups. Is the hypothesis correct that in development work it is best to support just women? Pali agrees without reservation. “Women work best”, she explains, “If women earn money, they invest it in their children, in food, health care and school. Men invest the money in alcohol and in a mistress”. As the saying goes, “Educate a woman and you educate a nation”.

Pali’s grandparents were farmers, her father studied agronomy. She saw as a child his attempts at cultivating the land and so the beetroot in the BOKU garden is very familiar to her.

“Research for Development” – social responsibility for a sustainable development in the South

Five years ago, the University of Natural Resources and Applied Life Sciences, Vienna (BOKU) founded the Research for Development Forum (DEV-FORUM). As a result, new research co-operations have been formed for a more just and united world. Today, the DEV-FORUM is a cornerstone of the responsible university academic landscape.

What is “research for development”?

The term “research for development” is enjoying much success in the current knowledge and development discourse. At the same time, “research for development” is used and defined in a very different way. BOKU associates no academic discipline with the concept in the original meaning of the word but defines “research for development” as a cross-disciplinary research strategy which uses innovative methods to deal with the academic questions associated with reducing poverty and promoting development. A central feature of the self-definition of “research for development” is the attempt to contribute to ecologically adapted, socially responsible and economically viable sustainable development in the poorest countries of the world.

Task of “research for development”

The meaning of “research for development” comes from the ever more complex problems of poverty, hunger and environmental destruction. The annual Human Development Report of the United Nations for 2005 gave only modest reason for optimism. In the last decades of development, around 130 million people have been pulled out of extreme poverty whilst one fifth of humanity lives off two US dollars per day. Another fifth survive on one US dollar per day, too little to ensure the basic human needs. The task of “research for development” is to react in a constructive way to these challenges and not in a paternalistic or romantic way but to develop partnership and solution-based strategies which support an endogenous development worthy of humans. “Research for Development” is thus more than just re-labelling old academic products and processes.

What is the DEV-FORUM?

By founding the DEV-FORUM, an academic platform was created to provide an interface between university research, the educating of students and development-political practice. The task of the DEV-FORUM is to gather together the specialist competencies and knowledge across the traditional disciplines and the organisational system boundaries. Academic subject areas which form the profile of the DV-FORUM are focussed on the meta-level of reducing poverty. This profile is consistently based on the relevant areas of competency within BOKU. The concrete implementation of “research for development” is carried out in direct co-operation with institutions in the South such as partner universities, state research institutions and non-governmental organisations.

"Research for development": technology and process

The implementation of a research strategy aiming to meet the normative requirements of "research for development" by contributing to poverty reduction requires a combination of expertise in both technology and processes. This is why the DEV-FORUM is pursuing a dual strategy, looking closely at both of these areas.

Technical expertise

Working in partnership to formulate development strategies which contribute to poverty reduction and food security in the South requires interdisciplinary (technical and methodological) expertise. Central to current research cooperation are the development of sustainable ways of dealing with resources (soil, livestock, water, forests), ways of optimising agricultural irrigation systems and ways of ensuring food security by identifying new sources of income for rural households (e.g. the production and sale of agricultural and forest produce). Such research projects are being carried out in Africa, Asia and Central America. The DEV-FORUM's technical expertise is expressed through the scientific work of its members.

Process expertise

The successful implementation of development-related strategies at a local and regional level requires social innovations, which in turn involve a range of groups with widely varying interests. A second focus of the DEV-FORUM is therefore on the integration of technical with social innovation, realised at various levels by means of actor-orientated learning and development processes. The DEV-FORUM's process expertise is displayed in its critical analysis and evaluation of social developments and processes, all focusing on the various development pathways out of poverty. These include the development of the financial and institutional conditions which allow technical innovation to occur, along with active political dialogue.

Vision and strategy

The goal of the BOKU's "research for development" community over the coming years is to systematically develop the DEV-FORUM into an inter- and transdisciplinary centre of expertise focusing on development-related research, capacity building and scientific training in the South, technical consultancy development coaching, as well as institutional learning through dialogue and communication. This organisational and technical development of the DEV-FORUM will strengthen the BOKU's commitment to a just and fair world and is an active contribution to global sustainable development. The DEV-FORUM aims to be Austria's main centre of "research for development" by the year 2015.

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Intellectual capital – the resources of the "Responsible University"

Intellectual capital – human capital

Staffing levels and composition

The staffing figures for both years relate to the situation as of October 15 of each year. The small difference between the figures for the numbers of professors given here and the figures given in the intellectual capital report 2004 is due to the fact that in 2004 one professorship was, for a short period, suspended and also due to the fact that at the time of the compilation of the 2004 report the method of calculating the figures had not yet been finalised. The use of the employment definitions given in Z 2.6 of Appendix 1 of the BidoVUni (government regulations governing universities' documentation) as the basis for the calculation of the various personnel statistics had not yet been considered in 2005 when the first intellectual capital report was published. A comparison of the figures (equivalent to full-time positions) for the calendar year 2005 with those for the previous year shows that the number of full-time academic personnel has in fact altered only slightly.

On 15 October 2005, the date taken for statistical purposes, BOKU employed 1,809 full- and part-time staff. When comparing this with the 2004 figure, it should be noted that in 2005, in keeping with the Intellectual Capital Report Act, teaching staff and tutors have also been included *(see Table 2)*. This explains the difference with the previous year's figure, which did not include teaching staff, tutors or those employed under § 26 (Universities Act, 2002) (1,297). In 2005, 42.8% of all staff were women.

Of the academic staff, 38.6% were female, whilst among non-academic staff the figure was considerably higher at 55.7%. Among academic staff, the proportion of women whose posts are financed by third-party funding (in accordance with § 26 and § 27, Universities Act, 2002) is, at 47.7%, considerably higher than among those holding university lectureships (18.5%) or professorships (12.7%). It should be further noted that in the case of professorships this figure includes guest professors, which was not the case in the intellectual capital report 2004 *(Group 12, Table 2)*.

When expressed in full-time equivalents (i.e. as the equivalent number of full-time positions), not including third-party funded posts (§ 26 and § 27) or teaching staff and tutors, BOKU has the equivalent of 769.8 full time staff, of whom 304.9 are women and 464.9 are men *(see Table 2)*. The women thus make up 39.6%. Considered by staff group, the figures are as follows: 346.3 full-time academic posts and 423.5 full-time non-academic posts. The proportion of female academic staff rises from 14.3% among professors to 24.2% among assistant lecturers and other academic staff.

Training

There has been a considerable increase in the number of third-party funded personnel (as the number of individuals employed) of over 20%, which can be related to the increased level of procurement activity. The number of standard staff has, however, fallen slightly.

The range of academic backgrounds of the staff of BOKU is, in accordance with BOKU's departmental organisation, broad and ranges from scientific and technical to socio-economic specialisations. The majority of posts are filled from BOKU's own ranks; BOKU remains, however, an attractive employer for graduates of other institutions thanks to its interdisciplinary set-up.

Table 2

Staff on due date October 15th 2005 (II.1.1)

	2005			2004		
Staff equivalent to full-time positions	Females	Males	Total	Females	Males	Total
Total number of academic and art staff[1]	77.0	269.3	346.3	69.8	261.5	331.2
Professors[2]	8.0	52.8	60.8	7.0	51.7	58.7
Assistant lecturers and other academic and art staff[3]	69.0	216.5	285.5	62.8	209.8	272.5
including lecturers[4]	21.3	100.5	121.8	21.3	97.0	118.3
Total number of general staff[5]	227.9	195.6	423.5	240.0	206.2	446.2
Total[6]	304.9	464.9	769.8	309.7	467.6	777.4

1 functions 11, 14, 16, 21 according to subsection 2.6 of Appendix 1BidokVUni.
2 functions 11 according to subsection 2.6 of Appendix 1BidokVUni.
3 functions 14, 16, 21 according to subsection 2.6 of Appendix 1BidokVUni.
4 functions 14 according to subsection 2.6 of Appendix 1BidokVUni.
5 functions 23, 40 to 70 according to subsection 2.6 of Appendix 1BidokVUni.
6 functions 11, 14, 16, 21, 23, 40 to 70 according to subsection 2.6 of Appendix 1BidokVUni.

	2005			2004		
Headcount excluding staff on temporary leave)	Females	Males	Total	Females	Males	Total
Total number of academic and art staff[1]	529	840	1,369	440	787	1,227
Professors[2]	8	55	63	9	54	63
Assistants and other academic and art staff[3]	521	785	1,306	431	733	1,164
including assistant professors[4]	23	101	124	22	98	120
including staff financed by third-party funding[5]	241	264	505	200	239	439
Total number of general staff[6]	261	208	469	274	221	495
Total[7]	774	1,035	1,809	698	990	1,688

1 functions 11, 12, 14, 16, 17, 21, 24, 25, 30 according to subsection 2.6 of Appendix 1BidokVUni.
2 functions 11, 12 according to subsection 2.6 of Appendix 1BidokVUni.
3 functions 14, 16, 17, 21, 24, 25, 30 according to subsection 2.6 of Appendix 1BidokVUni.
4 functions 14 according to subsection 2.6 of Appendix 1BidokVUni.
5 functions 24, 25 according to subsection 2.6 of Appendix 1BidokVUni.
6 functions 23, 40 to 70 according to subsection 2.6 of Appendix 1BidokVUni.
7 functions 11, 12, 14, 16, 17, 21, 23, 24, 25, 30, 40 to 70 according to subsection 2.6 of Appendix 1BidokVUni. Individuals in more than one function are included only once.

Staff turnover

New staff are of enormous importance for an educational and research organisation like BOKU. The number of publicly-funded academic staff (professors, lecturers and assistant lecturers) joining and leaving in 2004 and 2005 was relatively low; the figure for 2005 was even lower, with eleven researchers leaving. Taking into account the total numbers of full- and part-time research staff, this corresponds to a leaving rate of approx. 1.3% of publicly funded academic staff *(see Table 3: researchers financed without third-party funding, number of individuals).* The number of staff joining in both 2004 and 2005 more than compensated for the numbers leaving; in 2004, twice as many, and in 2005, three times as many, academic staff joined as left. The numbers of non-academic staff joining and leaving were roughly equal.

Table 3

Newly employed staff at BOKU in the years of 2004 and 2005 (head-count)

	2005			2004[1]		
	Females	Males	Total	Females	Males	Total
Total number of academic staff	84	82	166	7	24	31
including staff financed by third-party funding	72	61	133	–	–	–
Total number of general staff	51	49	100	31	16	47
Total	135	131	266	38	40	78

1 2004: Data excluding staff financed by third-party funding. Accoding to the Universities Act 2002 all staff financed by third-party funding were included in the staff numbers of the university as of January 1 2004

Staff leaving BOKU in the years of 2004 and 2005 (head-count)

	2005			2004[1]		
	Females	Males	Total	Females	Males	Total
Total number of academic staff	59	63	122	5	11	16
including staff financed by third-party funding	57	54	111	–	–	–
Total number of general staff	41	56	97	19	18	37
Total	100	119	219	24	29	53

1 2004: Data excluding staff financed by third-party funding. Accoding to the Universities Act 2002 all staff financed by third-party funding were included in the staff numbers of the university as of January 1 2004

Because the third-party funded posts were first included in the university staffing figures from 1 January 2004, an analysis was undertaken of the fluctuations in the numbers of these staff for the first time in 2005.

Although the majority of research institutions have made efforts to employ their third-party funded staff not just in the short-term but rather to engage them in a long-term way, a relatively high fluctuation of these full- and part-time staff is still noticeable. A comparison of the numbers leaving and joining with the total number of third-party funded staff shows that the fluctuation rate is some 13%, which includes more staff joining than leaving as a result of the increasing levels of third-party funding.

Academic staff by nationality

An analysis of the academic staff by country of origin (level of internationalism) shows that more than three quarters of the academic staff are of Austrian origin (*see Figure 7*). A further 12% come from countries within the European Union, the larg-

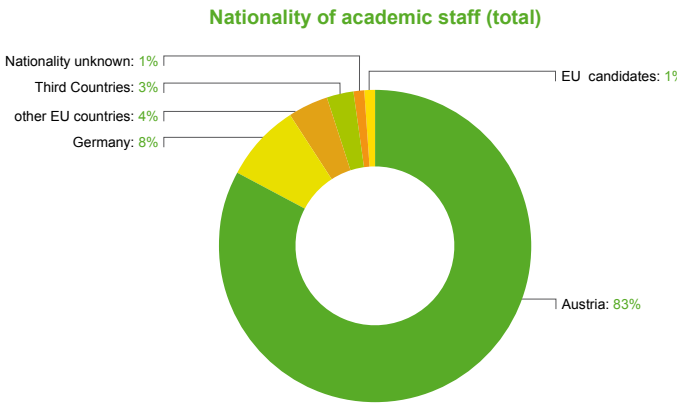


Figure 7

Nationality of academic staff financed by federal and third-party funding

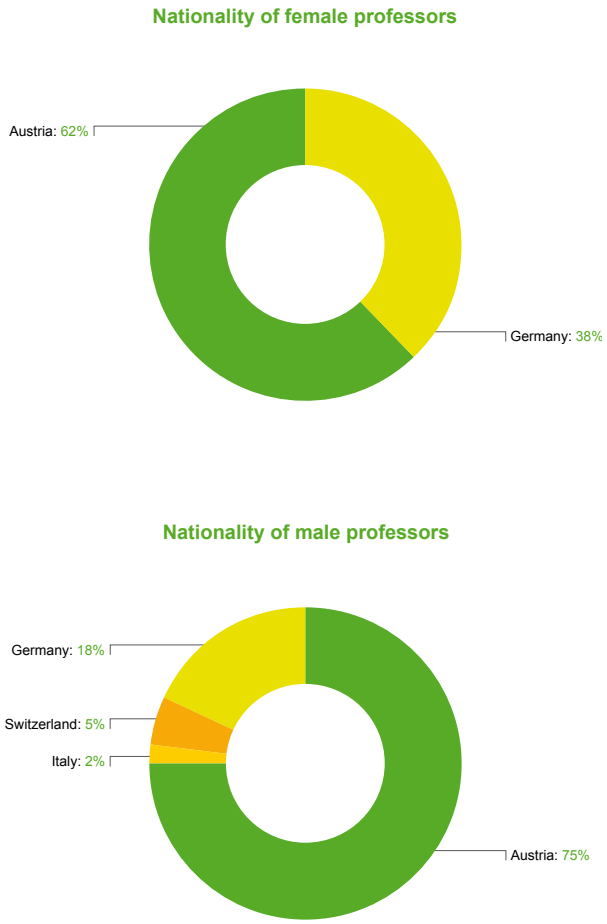
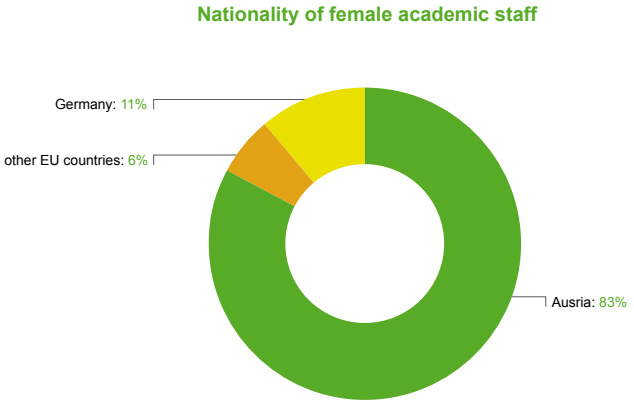


Figure 8

Nationality of male and female professors in 2005



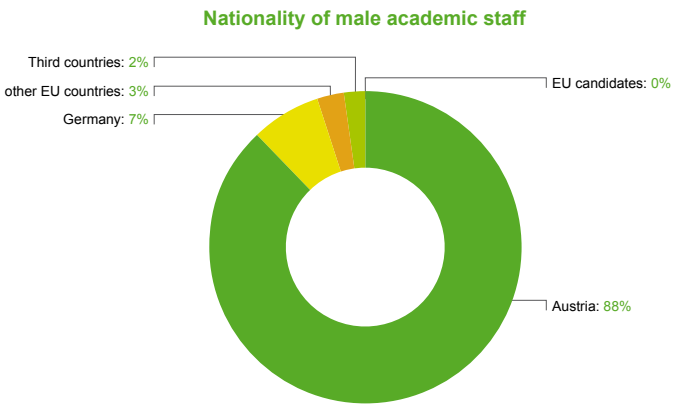
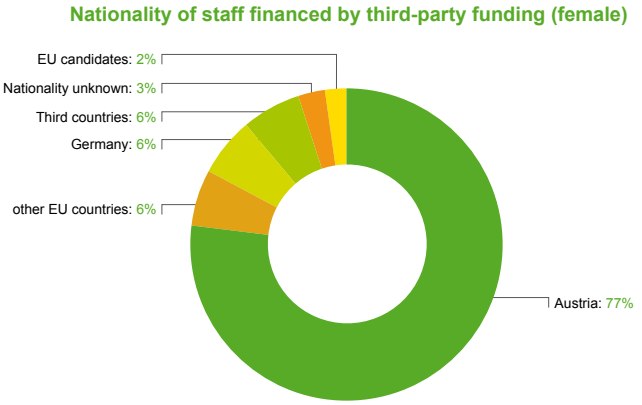


Figure 9

Nationality of male and female academic staff (lecturers, assistant lecturers) in 2005



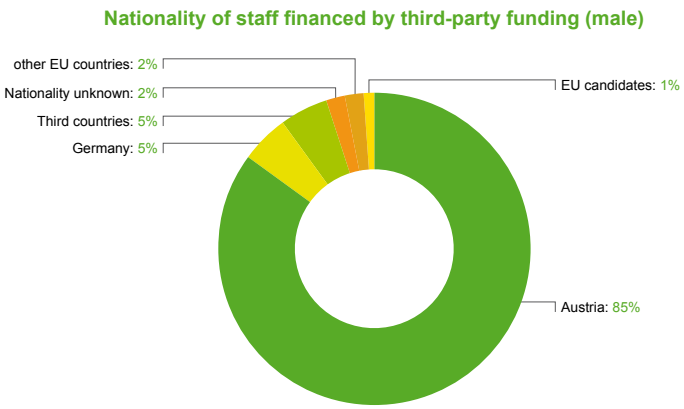


Figure 10

Nationality of male and female academic staff financed by third-party funding in 2005

est group of whom are German. The remaining staff members come from EU candidate countries and other countries.

The largest proportion of non-Austrian academic staff members is to be found among professors *(see Figure 8)*. On average, 25% of professors come from other EU countries or Switzerland.

Among other groups of staff, a lower proportion of research staff are of non-Austrian origin *(see Figures 9 and 10)*.). The proportion of foreign federally funded and foreign third-party funded academics is similar. It should, however, be noted that the group of third-party funded academics is becoming more international and also including an increasing number of individuals from developing countries.

The degree of internationalism is at its lowest, at around 7%, among university lecturers, as was already to be seen in the intellectual capital report 2004. BOKU will make efforts in the coming years to increase the internationalism of its research staff.

Personnel planning and appointments

The selection procedures take into account the existing personnel structures and aim at achieving flexibility. BOKU believes that these problems will be solved by a combination of external renewal and internal career development. As a result of the large number of scientific assistants on permanent contracts, flexibility must be driven from within. When professorships become free, the option is considered of appointing a qualified lecturer already working at BOKU to lead the institute, using the resources which this move would make available for bottom-up renewal.

In 2005, personnel categories were defined to allow comparisons to be made across the university. These categories were

Andrea Handsteiner

Given her job as personel manager, one might assume that Andrea Handsteiner holds a doctorate in law. But no – she's lively and communicative and has a much more colourful background than that – she studied culture and communication, in other words European ethnology, at the University of Vienna. Before joining BOKU, she worked for Ericsson Austria as a Human Resources and Staff Development professional.
Andrea Handsteiner is someone who loves to work with people, and is not afraid of a challenge.

"It's essential to know the goals of your organisation and to focus on the people. Universities obey different rules to companies", as she soon found out. "The range of approaches possible in the private sector is far greater", she adds. In her office hang a number of incomprehensible documents, testifying to the red tape of times gone by and a sign of how much has changed. She says that BOKU was extremely bureaucratic – "I've never come across anywhere else where rules are quoted so often, despite – or perhaps because – the rules are so often unclear". There are, for example, still no collective agreements. But BOKU is small and perfectly formed – people are happy to work here. We often don't see all the good aspects that exist here", says Handsteiner on a more positive note. "The personnel management must work to ensure that people can work as effectively as possible." Staff development benefits all employees, in particular those with leadership and management roles: "Management skills can be learnt – it's a craft", she says. She sees staff development as an important task for the organisation – but the individual responsibility of staff members is just as vital: "It is essential that one takes care not to burn out and especially that one doesn't lose one's sense of humour."

used to create a quantitative personnel structural plan for each organisational unit. The university averages were taken for purposes of comparison. This assessment of the status quo was made available to the heads of departments for the purposes of strategic personnel planning.

The next stage of planning took place in combination with the setting of the university focuses. The occupancy of key positions (professorships) was set down in 2005 in the development plan as a key issue.

The selection and appointment of personnel is carried out by the departments themselves in conjunction with the human resource department. The human resource department is responsible for the administration of applications and for advertising the posts in a range of print and online media. The selection of applicants is carried out by departments; the personnel department provides advice and support when needed. When required, selection tools are used: personality tests, assessment centres, strategic and aptitude tests.

The selection procedure for professorships is carried out in close co-operation with the Senate and Rectorate. Quality assurance measures taken include the use of working groups to define the required academic specialisation and to write clear texts for use in the job advertisements. The media in which the post is to be advertised is determined by the working group. The media chosen always include the German-language national or international press. The selection procedure is managed by a selected, well-known recruitment firm. As well as candidates' professional achievements, their social and leadership skills are tested by means of custom-designed personality tests.

In 2005, three professors were appointed to posts at BOKU, including one woman. This was one less appointment than in 2004 *(see Table 4)*. Unlike in 2004, all were in-house appoint-

Helga Pülzl

Why did she study political science at the University of Vienna? "Because I wanted to become president and thought I'd learn how to be a politician", she laughs. She soon lost interest in this, but still went on to complete her studies with distinction. She comes originally from Upper Austria and has seen a lot of the world. Her travels started when her sister married an Italian – she learnt the language and spent a year as a student at the University of Messina in Italy. The offer of a job working on a research project then brought her to BOKU. Here, Helga Pülzl deals with, among other things, issues of communication, coordination and co-operation in European forestry politics. There is no common legal framework dealing with forests in the EU, just a huge jumble of European directives and guidelines. Working on the European EFORWOOD project, she deals with the question of the influence of European law and politics on the forest/wood chain. Subjects she teaches at BOKU include international forestry politics, which she finds interesting because "every course is different". Her experience was very different at Ramkamhaeng University in Bangkok. There, the students refused to contradict the teachers and no real discussion was possible. She has attended courses in Great Britain, Germany, Honolulu, New York, Cairo and Brussels, giving her ample opportunity to draw comparisons, and she now says that "BOKU is one of the best places one could hope to work". She is particularly impressed by the collegiate atmosphere that prevails among the members of the departments. As a scientist, she saw herself at an advantage when it came to starting a family: "I can think and work wherever I am, even at home". Pülzl hopes to increase the co-operation with other departments, so that she can become more familiar with other scientific perspectives. What she is less keen on is the university's strategy for dealing with project workers: "At the moment, it's impossible to offer a colleague a long-term opportunity; when they leave, it often means a big loss for us in their field".

Table 4

Number of appointments to the university (II.1.3)

	2005			2004		
	Females	Males	Total	Females	Males	Total
In-house appointments	–	–	–	–	2	2
Other Austrian appointments	–	1	1	–	1	1
EU	1	–	1	–	1	1
Third countries	–	1	1	–	–	–
Total	1	2	3	–	4	4

ments. All were given only temporary contracts. The successful completion of a personal evaluation, carried out by external, international assessors, is an absolute requirement for a permanent contract.

In 2004, BOKU developed its own procedure for the appointment of professors on temporary contracts. This was first used in 2005, for the appointment of the Professors of Resource-orientated Construction (Prof. Treberspurg) and Animal Breeding and Population Genetics (Prof. Sölkner). The procedure was set in motion by the selection by the Vice-Rectors for Research and Education and by the departmental research representatives and teaching staff of the members of the evaluation committee, consisting of equal numbers of professors and of non-professorial teaching staff, and a student representative. The process is based on an internal evaluation report and on external peer assessors, and results in a recommendation being made by the evaluation committee to the Rectorate.

Staff development

An internal progression model has been tentatively sketched out (doctoral students, postdocs, habilitated academics, professors, heads of academic working group, staff scientists). The concrete arrangements are being developing with the aim of maintaining international competitiveness.

A key challenge for BOKU in the future will be to attract, develop and retain the brightest minds. BOKU seeks to provide the best academic and professional qualifications for its staff. A key criterion of quality is the ability to encourage and support young academics through their habilitation. In 2005, discussion continued between the Rectorate and the Senate over the guidelines entitled “Requirements for habilitation at the University of Natural Resources and Applied Sciences Vienna”, in order to ensure a well qualified new generation of academics.

In 2005, a total of five researchers were habilitated at BOKU *(see Table 5)*. This is 75% less than in the calendar year 2004 and thus represents a considerable fall. The fall can, however, be accounted for by the lapse of the old assistants’ contracts. In 2003/4, the last permanent appointments in keeping with the old employment regulations were made. Accordingly, a large number of staff made use of this opportunity during these two years.

Table 5

Number of teaching qualifications (habilitations) awarded in 2004 and 2005 (II.1.2)

2005			2004		
Females	Males	Total	Females	Males	Total
–	5	5	4	15	19

Despite this, BOKU is seeking to increase the number of habilitations in the medium term, and to offer staff optimal opportunities with the new habilitation guidelines which are expected to be approved in 2006.

The focus of training for non-academic staff is on language and IT courses, and on profession-related training (e.g. accountancy). For academic staff, the focus is on offering courses on teaching skills and e-learning. A survey is to be carried out to ascertain the needs of various target groups as regards training to determine the future courses to be offered. This survey will be used as the basis for a personnel development portfolio for 2006.

The entire process of target and staff consultation is to be redesigned and training given to aid the setting of targets and holding of staff discussions. In addition, since the start of 2005 new appointees to key academic positions (professors and heads of strategically important working groups) are paid in part on performance-related terms, linked to their success in meeting individual targets.

Occupational safety and healthcare

BOKU seeks to help its staff to maintain the best possible state of health.

To this end, BOKU staff have been taken care of since September 2001 by Health Consult, an occupational health centre with ISO 9001:2000 certification. In addition to the occupational health consultations held at BOKU locations, staff have access to a healthcare centre, located in district 1. A team of experts including emergency and occupational psychologists can be called upon when needed for emergency intervention.

In addition to dealing with work-related accidents and emergencies and medical checks *(see Table 6)*, individual advice was given in 2005 on issues including nutrition, ergonomics in the workplace and dealing with bullying. Medical inspections and advice sessions were also carried out, including the issuing of documents dealing with occupational health issues (see “Activities”). Of particular benefit to BOKU staff is the opportunity to be collect minor prescriptions from the workplace doctor, whether private or state-issued, thus avoiding time-consuming trips to their usual doctors.

Activities of the workplace doctors

- Vaccinations and advice for those exposed to risks at work
- Travel advice for those making work-related trips abroad
- Nutritional advice
- Analysis of accidents in the workplace
- Ergonomics in the workplace
- Setting of aptitude and follow-up settings in accordance with §49 of the Arbeitnehmerinnenschutzgesetz (employee protection law)
- Participation in risk assessment (evaluation)
- Workplace inspections to meet maternity regulations
- Inspections of external workplaces

Wei Wu

"People have always", says Prof. Wu, "concerned themselves with building on, in and with the Earth. Whether it was great walls or pyramids, man learnt primarily through trial and error." Prof. Wu's specialisation, geotechnical engineering, is a young and interdisciplinary field of engineering which incorporates disciplines such as soil and rock mechanics, earth and foundation works, dam design, underground construction, transportation construction and environmental earth sciences. Today, alongside the traditional building materials, research is being carried out on new artificial materials, which can be used, for example, to seal landfill sites or maintain banks. Research and practice are closely entwined in this field. The research is influenced by the local geology, which is highly varied in the Vienna area. Recently, Prof. Wu and his colleagues have been increasingly involved in issues of natural dangers and risk management. They have been looking at the stability of dams and flood control reservoirs in connection with the recent floods in Austria.

Wu and his team are highly international: he has recruited his colleagues from Iran, Germany, Russia, China and New Zealand, and they are equally as internationally involved when it comes to their work. Wu has just been appointed co-ordinator of an EU project called NISMIST, whose full title is "Management of environmental risks associated with landfills in seismically active regions in the New Independent States of Central Asia". Over the next three years, Wu will work together with scientists from Germany, France, Russia, Kyrgyzstan, Uzbekistan, Kazakhstan, Turkmenistan and Tajikistan to investigate the risks associated with major landfill sites in seismically active zones. It requires a great deal of experience to enable all the different nationalities to communicate effectively. "Except for the older Russians, all of us speak English", says Wu, and it seems clear that he will deal with all the problems arising with his stiff resolve and competence. He's had plenty of opportunity to practise these skills. Prof. Wu graduated from Wuhan University in southern China in construction engineering. He then studied geotechnical engineering at Xian University, took a year-long course in German in Shanghai and started work on his dissertation at Karlsruhe University's Institute of Soil and Rock Mechanics. The list of projects he has worked on is impressive, ranging from metro stations in Athens and designing tunnels for the new Köln-Rhein/Main rail link to making detailed plans for the Gotthard Base Tunnel. Germany, Kuwait, Greece, Switzerland – Prof. Wu moves between cultures seemingly effortlessly. His zeal is almost uncanny – because there was no major international journal of geotechnical engineering, he founded one. The well-known Springer publishing house showed an interest and Prof. Wu is now Editor in Chief of the new "Acta Geotechnica", which appears quarterly with around eighty pages. He has attracted well-respected colleagues from all over the world to contribute to the new publication.

For Prof. Wu, independent research is essential. He is very grateful that the Otto Pregl Foundation for Fundamental Geotechnical Research allows posts to be funded. It is very important to Wu that his team members are happy in their work. "Sometimes", he laughs, taking a sip of green tea, "having too few challenges can be almost worse than having too many!"

– Eye-test clinic with testing of existing sight aids and information about computer screen protection
– Participation in the monthly meetings of the preventative healthcare committee

Table 6

Overview of service hours and services of BOKU workplace doctors in 2005

Services	2005
Service hours	636.66
Vaccinations	480
Medical check-ups	150
Eye tests	60
Evaluations/workplaces for staff with disabilities	4

Courses offered

- Defibrillation training (defibrillation for non-professionals)
- Spinal column exercises
- First aid courses

On average, BOKU staff took 3.1 days off sick in 2004. In addition, a total of 107 days were taken off as a result of work-related accidents and 311 days for rest cures. For 2005, the figures can only be given as yet for those employed as civil servants, as all other staff are currently being entered into a new personnel system (SAP-HR). Figures such as the average number of sick days taken cannot yet be obtained. It is anticipated that this will be possible in the intellectual capital report 2006.

The university's civil servants took on average 3.8 sick days in 2005. A total of 117 days were taken off work for the purpose of taking treatments.

Intellectual capital – structural capital

Structural capital, alongside human capital and relational capital, makes an essential contribution to the university's core processes. Measures taken to move closer to equal opportunities for women, gender specific measures in general, research databases and research infrastructure, the built environment, special service providing departments working to improve and promote contacts and co-operation beyond the university and the development of our educational and research activities – these are some of the aspects of structural capital, as defined in the Intellectual Capital Report Act. These also provide, from BOKU's point of view, the essential components of an optimal environment for working, researching and learning in. Only under the best conditions can BOKU's research staff, supported by the service units, achieve their very best in education and research.

Advancements for women

BOKU takes very seriously the tasks of promoting women's academic achievement, promoting the next generation of female scientists, increasing the proportion of female researchers working on projects and completing dissertations and habilitation and supporting female BOKU students. How seriously BOKU takes these issues, is shown by the developments of the past decade, which have seen an increasing proportion of female researchers. In particular, in the case of third-party funded staff the proportion of women is already nearly equal to that of men *(see Table 27, p.98)*. This gives hope that in the medium term it will be possible for this important group of staff to lead to a rise in the proportion of women among the federally funded staff.

In comparison with the figures in the intellectual capital report 2004, the amount of women-related expenditure in 2005 was considerably higher *(see Table 7)*. This money was spent primarily on personnel, material and spatial costs.

Table 7

Funding for measures promoting equal opportunities and affirmative action for women in Euro (II.2.1)

	2005	2004
Funding for measures promoting equal opportunities and affirmative action for women in Euro	45,500	27,963

Equal opportunities working group

This was set up provisionally (in anticipation of the passing of the relevant statutes) in 2005 in accordance with §19, Universities Act 2002. It acts as an interdisiplinary organisational unit of BOKU. The head of the coordinating office is also head of the working group on equal opportunities. This organisational structure allows easy and direct co-operation between the Coordinating office and the working group, as well as with the university management, because the head of the coordinating office takes part in the university's regular management meetings.

The focus for the coordinating office in 2005 was on improving the current situation regarding women, offering advice and developing strategies to implement measures aimed at promoting women and equal opportunities (e.g. having an input into the setting of societal goals in the target agreements) in future, the gathering of information in relation to the advancement of women, gender mainstreaming and gender research (such as through events, advancement programmes and the use of gender-neutral language), as well as on the transmission of these on to the members of the university.

Prof. Ilan Chet

www.weizmann.ac.il/

Sustainability has many aspects

The microbiologist Prof. Ilan Chet is President of the Weizmann Institute of Science in Rehovot, Israel. The Weizmann Institute, one of the world's most respected research facilities, serves as a model for the AIAST, currently under construction in Gugging, Austria.

Ingeborg Sperl spoke to Ilan Chet in Israel.

Prof. Chet, you are a specialist in biological crop protection, including its biotechnological aspects. What does sustainability mean in practice for the Weizmann Institute and its research?

Ian Chet: Water will be of key importance in the future, especially for Israel, as will agriculture and research into alternative energies such as solar energy.

Sustainability, for the university system, means, for example, holding patents. We receive some 100 million dollars annually from our patents – just 36% of our budget comes from the state. We want to avoid being dependent on the government at all costs.

A second issue is education. Schoolchildren need to be given an interest in research. An Institute for Science Education has been set up, which is a non-profit organisation funded by sponsorship. It deals with around 500 teachers a week, who are given inspiration for their teaching. We are working here on new educational methods. Whole classes are also being taught – last year it was 7,000 children. They go into the laboratories and carry out their own experiments. The centre has a lecture hall for 200 children as well as a library. We are making special efforts to interest girls in science.

We organise such events as summer camps for those interested in maths and extra curricular activities for gifted children from schools all over Israel. There is a project for street children where they are taught physics for one afternoon a week. Courses are also offered for adults. The Weizmann Institute's scientists are also authors of Israeli schoolbooks – only the best are given this important task.

Interaction with the public is very important. Our large Garden of Science is open to the general public, where they can come to experience physical phenomena at first hand.

The Weizmann Institute offers a special system for children from deprived backgrounds, doesn't it?

Ian Chet: This initiative, which has had amazing success, was developed by Haim Harari, the ex-President (Haim Hariri has been for the past few months Chair of the Committee of the ISTA – Ed.). The tuition fee for each of the around 800 postdocs at the Weizmann Institute is $2,000. There is, however, the opportunity to earn back a part of this by spending four hours a week with a child from a socially deprived family. What they do with the child is up to them – reading, visiting the theatre or just playing games.

This idea has been taken up by other Israeli universities, coordinated by the Weizmann Institute. In the last 30 years, some one million deprived children, mostly from families of immigrants, have gone through the programme. We have to do something to help children to break out of the vicious circle of poverty and poor education. The students can call on their supervisors for help. At present, 30,000 students are involved in the scheme. There is no data regarding how many children have been helped to improve their social status but it is important to note that the students also benefit from the chance to learn social responsibility and learn to be a more integrated part of their society.

Sustainability also involves issues of gender…

Ilan Chet: A country as small as Israel simply cannot afford to waste brainpower. For every female scientist who becomes pregnant, a plan is developed by the management and members of the institute and places organised for crèches and nurseries. These facilities can be found on campus and are open until late in the evening. No woman has to choose between work and family.

The campus also offers everything needed for daily life. Only good infrastructure can allow top people to be attracted and retained.

The coordination office deals with the preparation of official documents dealing with equal opportunities and the advancement of women (legal research into B-GIBG [federal equal opportunities legislation], looking at the commentary on the Universities Act 2002 and the recommendations of the Equal Opportunities Commission), compilation of statistics (especially regarding proportions of women) and the coordination of information about the advancement programmes and projects such as the planned Laura Bassi laboratory.

The equal opportunities working group is in contact with relevant organisations at other Austrian universities with the aim of exchanging experiences. In addition, the working group is introducing procedures relating to the staff appointment process, which range from advising on the text of job advertisements and participation in interviews to looking at the lists of candidates and documentation relating to new appointments. In 2005, they were involved in 70 appointment procedures. In the field of third-party funded posts, 140 appointments were assessed in an abbreviated process. The working group was also represented in habilitation and promotion procedures.

Women's and gender research

Due to the university's research emphases, no special institute for women's and gender research has been set up at BOKU. There are, however, a series of women-specific teaching sessions (e.g. "feminist foundations of landscape planning and development", "women in the history of landscape planning and gardening", "women in the agricultural economy" with a special "women farmers" day being held) are offered and gender-specific research focuses have been set, such as GenderAlp! *(see p. 69).*

BOKU is taking part in the Delta3 e-learning project, together with the the Vienna University of Technology and the Academy of Fine Arts Vienna *(see www.delta3.at).* The aims of the project include the development of the university's e-leaning facilities and the exchange of experiences, so as to improve the opportunities for e-leaning on offer and thus improve students' abilities to combine studying with family life through enhanced flexibility of their study time. The project will integrate gender mainstreaming and aspects of the advancement of women into the e-learning on offer.

BOKU took financial and organisational part in 2005 in the "FIT – Females in die Technik" (Women in Technology) *(www.fitw-ien.at)* project, together with the Vienna University of Technology and several other higher education institutions, which saw the presentation of technology in schools.

Budgetary constraints have meant that only limited measures have been able to be taken to date at the university level to promote gender specific education and research. Based on internal calculations, BOKU will, not taking into account the individual departments, spend around €70,000 on gender-specific teaching, barely more than is recorded in the intellectual capital report 2004.

Gender-specific education and research has been an important part of the activity of the Institute of Landscape Planning, a part of the Department of Landscape, Spatial and Infrastructure Sciences, for around twelve years now.

The Institute of Landscape Planning has made available federally funded personnel as well some of its own resources in order to support gender-specific education and research. In addition, diplomas and dissertations have been supervised (such as "Landscape planning's contribution to the implementation of GM in regional development") which in turn contributed to educational activity.

Barbara Hinterstoisser

Her father, grandfather, great-grandfather and brother all were or are forestry wardens. It would seem inevitable that Barbara Hinterstoisser, who first studied biochemistry at the University of Vienna, should end up dealing with wood at BOKU – albeit in the slightly more abstract form of wood chemistry.

Interdisciplinary work is essential in this field, ranging from biotechnology and chemistry to the fibre and chipboard industries. “The materials that can be extracted from wood are particularly interesting”, says Hinterstoisser. “Resins, tannins and pigments have many applications, such as in food, as wood protection agents and in pharmaceuticals. One needs to co-operate with market researchers and see where the demand is. A great bonus at BOKU is that there are specialists in a wide range of areas. We are particularly well equipped in the field of renewable raw materials.”

It is important to her to present complex issues correctly but in such a way that everyone can understand them – especially when teaching, which is something she takes very seriously. She trained as a teacher of chemistry and physics whilst at the University of Vienna, which facilitated her move to BOKU, where a teacher was needed. She is also concerned with the propagation of scientific knowledge to a wider public – she has worked as a journalist, writing scientific articles for major daily newspapers. Her concern with making science understandable is especially appreciated by students in their first year. Their knowledge of chemistry is initially very varied, and Hinterstoisser makes the material come alive to her students by making references to real projects underway at BOKU.

She hopes that her chairmanship of the equal opportunities working group will allow her to ensure that “the best qualified people receive the best possible support, regardless of their gender. And that it becomes normal for women to be in leadership roles and that having a family need not compete with having a career.” When it comes to will power, Hinterstoisser leaves most men far behind. Some of the highlights of outdoor sporting activities of the qualified ski instructor include taking part in the “first Austrian women’s expedition” to Tibet, where she climbed to 7,000 metres, and crossing the highlands of Iceland by ski.

When a little closer to sea level, Hinterstoisser is to be found with her dog, an Australian Shepherd. Her predilection for cold climates is reflected in her preferred locations for research trips – Sweden and Finland. For someone who has been skiing from the age of two, the bleak ice and snow of the glacial landscape seems like her natural habitat: “There’s no more trees there, so I can take a break from my research.”

Marie-Theres Hauser

Her favourite flowers are old roses whilst her favourite plant, as far as science goes, is called Arabidopsis thaliana vulgo Ackerschmalwand. Marie-Theres Hauser works on fundamental research involving developmental plant biology and genetics. In this field, the delicate flower with the tiny white petals is the model organism. Her heartfelt plea to see the value of basic research is based on the importance that the results of this type of research can have for all other areas of research: “How is the cell wall built, what happens during cell division, which genes are responsible for cell morphogenesis and how do roots grow, and what influences their growth?” These are just some of the issues that are being investigated with the help of the model plant, because the fundamental processes are the same throughout the plant kingdom.

Marie-Theres Hauser’s team is linked with seven further working groups, working on for example the Austrian Genome Project, GENAU, funded by the Ministry of Education, Science and Culture, which was initiated by BOKU. This project is looking at such exciting issues as whether environmental stress can permanently affect genetic variation, which may be of vital practical importance given the threat of climate change. A project being carried out in co-operation with the Institute of Soil Science and Siebersdorf is investigating how certain plants react to soil contaminated with heavy metals. It has shown that willow trees which have been growing on such soil for some time can store up to six times more cadmium in their leaves, thus removing it from the soil, than those which are not used to such contamination.

Marie-Theres Hauser is an enthusiastic teacher. She is involved in looking after the students who take part in the GENAU Summer School and in the training of those studying for their diplomas and doctorates who it is hoped will continue in academia. She is involved in scientific education in many ways, from organising lectures and work experience in areas such as molecular biology and developmental biology to seminars with titles such as “How do genetically modified plants behave in the environment?”. She freely admits that she is a workaholic. She does not herself have any children – “I worked abroad for many years. But I am very supportive of colleagues with children. Two students in my team became mothers whilst working on their dissertations. I think it’s a decision that should be taken early – in the postdoc phase it’s often too late.”

What does she think could be improved at BOKU? “Young working groups should be able to work independently earlier. For someone like me, who’s whole research and eight to ten person working group is entirely financed by third-party funding, it would be nice to be able to support staff beyond the three-year project lifespan.” Marie-Theres Hauser is a keen proponent of flat hierarchies and discusses the current situation regarding how curricula are decided upon: “Before [the implementation of the Universities Act 2002 – Ed.], it was possible to become more actively involved in the Faculty Commission. These now have a purely advisory role and the important decisions are all taken by the Senate. I think this is a great shame. I also wish that BOKU paid more attention to fundamental research, was more bold about supporting risky ideas and continued to provide start-up financing for research ideas coming from within the university.”

Classical music is Marie-Theres Hauser’s way of recharging her batteries. “It’s essential for me – I go to concerts once or twice a week”. Gardening and rambling are other favourite pastimes – all activities which allow her to continuously hatch new ideas.

Education is carried out in close co-operation with external social and political science experts. In addition, the large number of lectures given contributed to raising public awareness. Selected national and international research projects include:

- GenderAlp! (Interreg III B)
- Women and men on the Move (Interreg III B)
- Quality of life of women and men in spatial communities and gender mainstreaming (Pfeil05)
- Quality improvement in gender mainstreaming

Staffing of service providing departments

BOKU has an equal opportunities working group and an office coordinating activities relating to equal opportunities, the advancement of women and gender research, in accordance with §19, section 2, subsection 7 of the Universities Act 2002 *(see Table 8)*. Both organisations are headed by the same female lawyer. The chair of the working group is a female BOKU professor. Twelve further people, including two men, participate in the working group in a voluntary, advisory capacity. The arbitration committee, set up in accordance with §43 of the Universities Act 2002, consists of three BOKU professors, two professors from other Vienna universities and a representative of the Vienna Chamber of Labour. The commission is gender-balanced.

To encourage inter-university contacts and co-operation, BOKU runs a research support office *(see Table 8)*. In 2005 as in 2004, 5.5 staff were employed.

Table 8

Number of staff active at special institutions (head-count) (II.2.3)

	2005			2004		
Type of institution	Females	Males	Total	Females	Males	Total
Equal opportunities working group according to §42 of the Universities Act 2002	11.5	2	13.5	12	2	14
including staff on a voluntary basis	10	2	12	10	2	12
Arbitration commission according to §43 of the Universities Act 2002	3	3	6	3	3	6
Organisational unit for coordinating matters pertaining to equal opportunities, affirmative action programmes for women, and gender studies according to item19(2)7 Universities Act 2002	0.5	–	0.5	–	–	–
Institutions that promote non-university contacts and co-operation outside of the university	13.5	7	20.5	13.5	7	20.5
including the Center for International Relations	6	2	8	6	2	8
including the Center for Education	5	2	7	5	2	7
including Institutions that promote educational development (e-learning)	–	1	1	–	1	1
including the Research Support Office	2.5	3	5.5	2.5	3	5.5

The main task of this service is to support researchers in initiating projects, knowledge and technology transfer and internal procedures such as project reporting, research evaluation and the development and quality control of the BOKU research database. The research support office is headed by the Vice-Rector for Research (not included in table).

A Centre for Education has been set up to support the development of education *(see Table 8)*. Its members include the Dean of Studies and also seven members of staff dealing with special areas. These work on, among other issues, curricula development, continuing education, teaching evaluation and quality management, advising potential students and e-learning. This latter, a relative newcomer to BOKU, was supported in 2005 by three students on a voluntary basis.

In addition, BOKU has set up a Centre for International Relations *(see Table 8)* for the purpose of promoting internationalisation in education and research. At present it employs seven members of staff. Both centres are run by the Vice Rector for Teaching and Internationalism (not included in the above table).

A concrete measure which has been undertaken at BOKU for several years now is child care (crèche and kindergarten). Both facilities, run as self-managed associations, were intended originally for the children of students. They are now also available to the children of BOKU staff. BOKU makes available the necessary infrastructure.

In 2005, the BOKU kindergarten association was provided with €4,500. In addition, BOKU made available around 280 square metres of space free of charge. The value of this space is, according to internal calculations, around €50,000 per annum.

Research databases / scientific journals

The BOKU library endeavours to make available to BOKU researchers as many academic resources in the form of online databases and scientific journals (in both print and online form) as possible, and of the highest quality possible. At present, a trend can be observed by which the costs of such resources are increasing whilst the resources available with which to pay for them are becoming ever more limited. We are working in association with other university libraries to negotiate the best possible deals for the provision of online resources.

It should, however, be noted that the costs are set by the providers in such a way that a higher price is to be paid at the start of each licensing period than in subsequent year(s) of the licensing periods. This means that the costs can only be meaningfully stated after a few years, when the costs and benefits can be compared over several licensing periods.

As a result, costs for available online databases on offer were, at € 127,161 per annum *(see Table 9)*, considerably lower in 2005 than in 2004. Furthermore, the BOKU library is making efforts to make further, smaller databases available to BOKU researchers.

In view of the cost of academic journals, whether online or in printed form, the same issue applies to these as to research databases. Here too, prices for the majority of journals are negotiated by the association of libraries for each licensing period,

Table 9

Costs for available online research databases in euro (II.2.7)

	2005	2004
Costs for available online research databases in euro	127,161	296,043

although the difference in costs between the two years is here not so extreme *(see Table 10)*. In addition, the BOKU library subscribes to a small number of important electronic journals which are of importance for BOKU research staff.

Table 10

Costs for available scientific journals in euro (II.2.8)

Type of publication	2005	2004
Print journals	651,767	683,271
Online journals	63,399	52,323
Total	715,166	735,594

In total, the BOKU library spends just over € 1 million per annum on these services. Researchers exert great pressure on the library to expand provision of e.g. journals, which the library would be very happy to be able to meet but cannot always afford to do so.

Research infrastructure

In 2005, around 2.16 million euro of additional expenditure on research infrastructure was recorded (*see Table 11*). In relation to the figure given in the intellectual capital report 2004 of expenditure of 1.3 million euro on infrastructure, it should be noted that the Intellectual Capital Report Act state that from now on a threshold of 70,000 euro is to be observed for inclusion in the figures. As a result, some of the investments made in the previous year cannot be included in the figures.

Table 11

Total funding for large equipment for research and development in euro (II.2.9)

	2005	2004
Total funding for large equipment for research and development in euro	2,165,600	597,600

Sponsoring

In 2005, € 39,800 of sponsorship money was raised by the university management and the central service units *(see Table 12)*. This was, unfortunately, considerably less than in the previous year. These figures do not include sponsorship raised by the academic departments.

Table 12

Proceeds from sponsoring in euro (II.2.10)

	2005	2004
Proceeds from sponsoring in euro	39,800	165,969

It should be noted that both the central service units and academic departments received in addition sponsorship in the form of various kinds of in-kind support, services rendered and discounts offered by Austrian firms.

Dr. Erhard Busek

www.idm.at/en/home/
www.alpbach.org/English/indexen.htm
www.seerecon.org/

“Assistance, not domination”

The importance of universities in Europe and across the world today lies in the possibilities of forming networks to facilitate not just research but education too. It may well be that small universities which concentrate on specific fields benefit from greater flexibility.

BOKU has special links in Central and Eastern Europe as a result of its historical experiences and connections, which have been astutely reactivated since 1989. Given the many problems that we in Central and Eastern Europe face with regards to the countryside and the ecological situation, these links are of especial importance. Vienna’s role is accepted because it is clear that we seek not to dominate but to assist. When we do this in the right way and with the required sensitivity, we can benefit not just ourselves but the whole of Europe and its universities.

Teachers and students are, in today’s world, an essential component of European and global processes. The universities must win back the strength which they enjoyed in Europe during the Renaissance and in later periods. We need a scientific debate about the future, in which universities must play a leading role.

The key themes that BOKU must deal with are clear when European and global development are considered; these issues deal not just with ecology but also with the entirety of the development process. We cannot simply sit back and accept the wholescale shift from countryside to city – we need equal quality of life as well as social and economic conditions in all areas. Above all, universities have a real chance to contribute not just knowledge but fresh perspectives too. The University of Natural Resources and Applied Life Sciences, Vienna is actually a Universität fürs Leben (University for life).

Dr. Erhard Busek

Premises

When comparing the floor space (Figure II.2.11 in accordance with the Intellectual Capital Report Act) in 2004 and 2005, it should be noted that the differences in the figures are due to the different definitions used in their calculation. According to the Act, “floor space” does not relate to technical areas or those used for transportation/parking. As a result, the total floor space used, 78,575 square metres, appears to be, but is not in fact, lower than in the previous year.

All BOKU buildings provide disabled access to all floors. This is achieved by means of access ramps in entrance areas and lifts.

Disabled access is indicated in all buildings by means of signs. In addition, all lecture halls have places accessible to those with disabilities. All buildings also have toilets for disabled. these technical adaptations were to a large extent introduced in the past year.

Furthermore, all buildings have been equipped in the previous year with defibrillation equipment, which is easily located by means of signs. The installation of places suitable for those with disabilities in the university library is planned for 2006.

Intellectual capital – relational capital

Building networks is of vital importance for a research and educational institution such as BOKU. New knowledge and innovation at BOKU are generated by means of inter- and transdisciplinary, cooperative research and teaching. Building networks means for BOKU, at the university level, setting up and developing partnerships with other research and educational institutions and other organisations, participating in joint projects with business, authorising and promoting spin-off projects etc.

For BOKU researchers, network building takes place through involvement in national and international academic communities for example through being active in societies promoting the advancement of science, academic publishing and committees or through the organisation of events, whether academic or practice-orientated (see also core process: "Societal and economic development" and its impact).

University co-operation in education and research

The number of cooperative interactions which the BOKU takes part in with national and international universities and businesses was again considerably higher in 2005 than in 2004 *(see Table 13)*. At present, 85 cooperative projects are underway, of which more than half involve universities in non-EU countries.

BOKU's newly agreed partnership agreements correspond to the focuses of the Internationalisation strategy (enhancing co-operation with Central and Eastern Europe and with Asia; a stronger role for BOKU in special target areas such as e.g. Mongolia; increasing the joint international study programmes on offer). The number of partnership agreements for the entire university reached by BOKU rose in 2005 by 10 to a total of 74. This means too that in the cases of some universities more than one partnership agreement for the entire university exists. The majority of these agreements concern education; only eight agreements are with research institutions.

In addition, agreements have been reached which will enable simpler administrative development of teaching projects. In the SOCRATES programme, 17 new bilateral agreements were signed; four earlier agreements were not extended. In total, BOKU had, in 2006/6, 126 SOCRATES-ERASMUS partner universities, a considerable increase over the year before (112). The relatively large number of university agreements with eastern and central european universities makes clear the geographic emphases of the internationalisation strategy. BOKU has, as it always has had, close ties to the universities in the neighbouring central and eastern european countries. As these countries have, for the most part, joined the SOCRATES programme, SOCRATES agreements have been signed with them in addition to the existing partnership agreements.

In 2005, new agreements were signed with the following universities as part of the SOCRATES-ERASMUS scheme:

- Université catholique de Louvain – UCL (BE)
- Agricultural University Plovdiv (BE)
- Hochschule Wädenswil Zürich (CH)
- EPFL – Swiss Federal Institute of Technology Lausanne (CH)
- Fachhochschule Neubrandenburg (DE)
- Universität Rostock (DE)
- Universitat Autònoma de Barcelona (ES)
- Ecole Nationale du Génie Rural, des Eaux et des Forêts (FR)
- Ecole Nationale du Génie de l'Eau et de l'Environment Strasbourg (FR)
- Université d'Orléans (FR)
- Institut National Agronomique Paris-Grignon (FR)
- Università degli Studi di Perugia (IT)

Dr. Michael Stampfer
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A shared concern for quality

Universities and research funding providers can work together to provide an even better foundation for elite research in Vienna

In academia, high quality is the result of hard work of excellent and highly motivated individuals and groups. BOKU is full of prominent examples of such people. Equally, these researchers and teams require (i) a good working environment within their institution, (ii) a variety of sources of third-party funding which reward quality, and (iii) the institution itself requires systems and feedback which allow quality to attract further financial support. For a long time, the Austrian academic system was lacking in such systems. This meant that for a long time there was too much reliance on pure self-motivation, not enough emphasis was put on allowing the critical masses required for quality to develop and the development of virtuous circles was long-winded and difficult.

In recent years, a number of factors have come together to allow quality creating systems to be set up more quickly: more money for science, demanding new funding providers and programmes, a city which has woken up to its universities, a better culture of evaluation and the 2002 Universities Act with its elements of performance and organisational capacity promotion. These have all been steps in the right direction and BOKU has, in recent years, always been among the first to grasp new opportunities, whether these concern content, organisation or structures.

The WWTF seeks, with over €7 million per annum, to provide incentives for the Vienna scientific system to create or strengthen virtuous circles of quality creation. Anyone hoping for funding from us must already be producing a high level of quality in order to succeed in the highly international and competitive selection procedure. The reward is funding of up to €800,000 and BOKU has already seen several successful applications for life sciences funding, allowing already strong research groups to develop further.

The interplay between external funding and universities' internal focus or resource allocation is especially clear in the case of the WWTF Foundation Professorships. The foundation gives €1.5 million for the setting up of new groups, each build around a leading researcher who has been newly brought to Vienna, focussing on a key field. The criteria to be fulfilled by a university applying for this funding are: recruitment of an outstanding (young) researcher, incorporation of the group into long-term strategies and development planning and the allocation of large levels of funding from both the university's own and third-party resources. Here too BOKU has had great success: one of the two WWTF Bioinformatics Fund professorships was awarded in 2004/5 to David Kreil at BOKU. ►

We hope that such support will serve to strengthen elite research in Vienna, providing good individuals and good groups with good levels of funding. At the same time, we always seek to provide a small stimulus for change. How well this is received depends upon the institutional conditions. The chances of success are best when a research institution and its researchers are in agreement over the essential quality goals and structures. The WWTF has no complaints in this regard – our experiences have been positive.

A further interest that funding providers and universities have in common is to ensure that the results of research move towards being put into practice. The new instruments provided by the 2002 Universities Act allow universities to run their own IPR policy. This requires the greatest levels of professionalism if one hopes to realise even a small proportion of the potential associated with patents, technology transfer, distribution of benefits and setting up of spin-off projects.

David Kreil: Fruit flies and happy old age

Bioinformatics – what exactly is it? A central application of bioinformatics is in so-called high throughput methods such as microarrays. This involves using many tiny DNA samples so that the activity of practically all of an organism's genes can be measured at once. Bioinformatic techniques also help with the identification of significant differences and their interpretation, which can often be very difficult. As each microarray result corresponds to a "snapshot", many such results can often be required to unravel complex relationships. Trends can be identified which allow researchers to see which genes are regulated in common. David Kreil, the WWTF Fund professor, and his team specialise in the analysis of such complex data. The group is at present using these methods to look at two different issues concerning fruit flies, the model organism:

1. What are the non-genetic causes of individuality? Which molecular mechanisms lead to the fact that identical twins often display not just different behaviour but also have different appearances? What role does chance play here? For research into such subtle differences, the methodological advances being made by the group in the field of microarray techniques are essential.

2. Which genes extend life expectancy without undesirable side-effects, and how do they work? In the long run, it is hoped that a better understanding of the molecular processes associated with ageing will allow improvements to be made in the quality of life of older people. Together with the team of fruit fly experts led by Barry Dickson at IMP, these questions are being systematically addressed by using a new technique in which single genes in adult organisms can be "switched off". Bioinformatic methods play an essential role in both the planning and data analysis stages of these investigations.

See also *http://bioinf.boku.ac.at/*

Table 13

Number of partner institutions/ enterprises incorporated in co-operation agreements (II.3.2)

	2005				2004			
	Home country of co-operation partner				Home country of co-operation partner			
Partner institution/corporation	Austria	EU	Third Countries	Total	Austria	EU	Third Countries	Total
Universities	5	17	43	65	2	15	42	59
Non-university R&D institutions	3	–	–	3	2	–	–	2
Enterprises	13	–	1	14	12	–	1	13
Schools	–	–	–	–	–	–	–	–
Non-scientific media (newspapers, journals)	–	–	–	–	–	–	–	–
Other	3	–	–	3	3	–	–	3
Total	24	17	44	85	19	15	43	77

- Ecole Nationale du Génie de l'Eau et de l'Environment Strasbourg (FR)
- Université d'Orléans (FR)
- Institut National Agronomique Paris-Grignon (FR)
- Università degli Studi di Perugia (IT)
- Akademia Rolnicza w Krakowie (PL)
- Universidade Nova de Lisboa (PT)
- Universitatea de Stiinte Agricole si Medicina Veterinara Cluj-Napoca (RO)
- University of Kahramanmaras (TR)
- Karadeniz Teknik Üniversitesi (TR)

BOKU's co-operation with universities in the USA, Australia, New Zealand and Canada primarily concerns education (student and teacher exchanges). Co-operation with other partner institutions in Asia and Africa is concerns primarily research. With some partner universities, co-operation involves both education and research.

Furthermore, BOKU is a member of the Euro League of Life Science Universities (ELLS), which was founded in 2004 together with the following universities, which have similar educational and research profiles:

- Swedish Univeristy of Agricultural Science (SLU), Uppsala, Sweden
- Royal Veterinary and Agricultural University (KVL), Copenhagen, Denmark
- Wageningen University und Research Centre (WUR), Wageningen, the Netherlands,
- University of Hohenheim (UHOH), Stuttgart, Germany

In 2005, the network was extended to include the Czech University of Agriculture, Prague (CUA) and the Warsaw Agricultural University (SGGW). Important co-operation in education occurs with the Technical University in Munich and the University of Bologna.

August Basil Temu

The stay of Prof. August Temu, from Tanzania, at BOKU was short but intense. He was involved in the Mountain Forestry Master's programme, looking at the social, cultural and ecological interactions taking place on Mount Kilimanjaro. He was enthused by the interest of the students and found Vienna itself wonderful, primarily because of the unique management of the easily-reached Vienna Woods: "every town should have one!"

Temu was Tanzania's first forestry scientist. He grew up in a village 2,000 metres above sea level, on Kilimanjaro. The pressure exerted by his parents, who were farmers, to do well at school was very great. Temu initially studied forestry in Uganda, continuing his studies in Norway and then again in Berkeley, California. When not travelling on behalf of international organisations such as the FAO, the UN and the World Agroforestry Centre, he teaches at the Sokoine University in Morogoro. For a country like Tanzania, the forest is of vital importance. It provides everything – water, food, animal fodder, building materials, fire wood and medicinal plants. The people, living without a social security safety net, rely on it for their survival. If the forest ceases to exist, the people starve. Tanzania has no institutions concerned with the forest, nor any private owners – the forests are common property. Conflicts arise when international agreements are reached which do not take into account local traditions of land use and its social implications. "We understand protection to mean the wise use of the forests", explains Temu. "This is different to the situation in Europe, where the protection of nature is very static and seeks to conserve. We, on the other hand, see protection as a dynamic process, constantly evolving." Forestry scientists have some influence in Tanzania. "Last year we managed to prevent the government from selling logging rights to a European wood firm at well under their real value."

Participation, co-operation and membership

In the past year, BOKU was a member of the following organisations:

- Angewandte Biokatalyse-Kompetenzzentrum GmbH, Graz
- Zentrum für Naturgefahren-Management GmbH, Innsbruck
- Kompetenzzentrum Holz GmbH, Linz
- biopure Referenzsubstanzen GmbH, Tulln
- WasserCluster Lunz GmbH
- Genossenschaft des AGRICULTURAL SCIENCESlichen Erwerbsgartenbaus Reg. Gen.
- Raiffeisen Lagerhaus Marchfeld Reg. Gen.
- Umwelt- und Innovationszentrum Judenburg GmbH

WasserCluster Lunz GmbH was founded in 2005, together with the University of Vienna and the Danube University Krems.

In addition, co-operation agreements exist, in particular in the field of research, with national and international universities and with non-university research and development institutions, as well as with departments of such institutions. These concern, for example, the joint funding of professorships (Vienna Science Chair of Bioinformatics), the setting up of Christian Doppler (CD) laboratories, the joint funding of research infrastructure etc.

- ACBT – Austrian Centre of Biopharmaceutical Technology, Vienna
- ARC Seibersdorf Research
- CD Laboratory of Receptor Biotechnology
- CD Laboratory of Mycotoxin Research
- Umweltbundesamt (Environmental Agency), Vienna
- ZSI – Zentrum für Soziale Innovation (Centre for Social Innovation) (associated with BOKU)

Table 14

Number of staff with functions in scientific journals (II.3.3)

		2005			2004		
	Refereed	F	M	Total	F	M	Total
Total	in refereed scientific journals	16.5	61.2	77.7	13.5	62.8	76.3
	in other scientific journals	2.5	16.8	19.3	2.5	14.2	16.7
	Total	19.0	78.0	97.0	16.0	77.0	93.0

– INiTS – Universitäres Gründungsservice Wien GmbH
– FH-Campus Vienna

The “foundations of wood work” and “reactive cellulose chemistry” CD laboratories came to an end in 2005. An agreement of association has been in place with the Centre for Social Innovation for a number of years which allows the Centre to represent itself as an institute associated with BOKU. In 2005, BOKU succeeded in including, for an initial period of five years, the University of Medicine Graz in a contractually determined agreement with the University of Veterinary Medicine Vienna, for the purpose of developing together in partnership a research database, which will be developed into a research management system.

BOKU is also a member of national and international associations which aim to provide long-term support in strategic areas (e.g. quality assurance, making available work experience to students etc.):

– Danube
– Deutsche Gesellschaft für Evaluation [German Evaluation Association]
– AUCEN – Austrian Universities Continuing Education Network
– Forum Neue Medien [New Media Forum]

Involvement in the scientific community

In addition to the above, BOKU researchers are actively involved in their own scientific societies, academies, associations, committees etc. BOKU professors and lecturers are also active as reviewers on external appointment and habilitation committees.

In 2006, a new Scientific Community Services registration system was implemented as a part of the BOKU research database, which allows an overview of the activities undertaken by BOKU researchers. Editorial and review work is primarily carried out by habilitated staff, but also sometimes by experienced postdocs. Just over 50% of the habilitated staff hold at least one position of responsibility with an academic journal, usually refereed *(see Table 14)*. Third-party funded research staff also undertake work for the scientific community in the form of reviewing, in addition to their research activity.

Friedemann Hesse, ACBT

It is well known that creating new medicines is an expensive process. The development process takes on average ten years and costs up to a billion euros. But in only 20% of cases is the end result of these years of research a new drug. It is, therefore, very much a long term process. To try and make the process a little easier, the ACBT (Austrian Centre of Biopharmaceutical Technology) is looking at ways of optimising the development process to make it shorter and less expensive, whilst allowing improvements in quality at the same time. “What we’re concerned with”, says Friedemann Hesse of the ACBT, “is not new products but rather with technological developments.” That’s what has brought competing firms such as Sandoz, Boehringer Ingelheim and Polymun Scientific together with the University of Innsbruck and BOKU. The combination of expertise from both universities and industry is the basis of the interdisciplinary “competence centre”. The ACBT’s research focusses on the development of new techniques for the creation of therapeutically useful proteins, such as erythropeitin and antibodies against HIV or cancer. “These medicines have become much more important over the past few years”, explains Hesse. “We are currently working on, among other things, a procedure which allows us to produce more homogeneous products than has been possible up to now using bacteria. This new technique makes it possible to express proteins in bacteria which could not be produced before, as they are toxic to the producing cells. With the new technique, our partners in industry are able not just to produce better products but also will be able in future to efficiently produce interesting new products which were impossible to manufacture up until now.” In other projects, the ACBT researchers are dealing with improving the expression of complex glycoproteins in hamster cells and the optimisation of strategies for producing and isolating active ingredients produced from cells or cell culture supernatant.

The ACBT, which was founded in 2001, has just been successfully evaluated and extended until 2009. The second research period which is now beginning should allow the ACBT to build on its achievements to date in order to further improve the “cell factories” required for the production of therapeutic proteins. In order to be able to do this, new areas and disciplines such as systems biology and bioinformatics will be given major emphasis in the new research programme.

Friedemann Hesse has been active as coordinator since 2002, providing a link between the different partners. He studied chemistry and biochemistry in Tübingen and made connections with Vienna early on, where he has lived with his wife now for four years. When not busy with running the competence centre or optimising hamster cells, he listens to music or plays golf – “it’s a good way of clearing your head.”

Borrowings and activities

The number of borrowings made at the BOKU library was around 10% higher in 2005 than in 2004 *(see Table 15).* As in 2004, students were responsible for 75% of borrowings, making them the main group of users. The number of borrowings by teachers and university staff was exceeded by those by external users. This latter group were responsible for almost twice as many borrowings as were BOKU staff. A major task for the BOKU library is thus to turn this situation around and to increase the interest of university staff in their collections.

A detailed analysis of the borrowings of academic books in the reading room of the BOKU library shows that in 2005 17,157 text books were loaned. A further 18,817 extensions were granted for text book borrowings. The average borrowing period was around 120 days, which corresponds to the maximum permitted.

The university library carried out a series of public activities in 2005 *(see Table 16),* increasing these by around 50%. The main activity was guided tours of the library. In addition, exhibitions and training events were held.

Table 15

Number of borrowings from university libraries (II.3.5)

Type of borrower	2005	2004
students	82,863	74,906
teaching staff/other university members	14,433	12,055
non-affiliates of the university	26,101	25,376
Total	123,397	112,337

Table 16

Number of university library activities (II.3.6)

Type of activity	2004	2005
exhibitions	12	19
training courses	13	–
guided tours of the library	42	24
Total	67	43

Round-table discussion with stakeholders

Participants:
Jürg Minsch (Discussion chair; BOKU and Minsch Sustainability Studies Zürich)
Karl Kienzl (Umweltbundesamt [Federal Environmental Agency], Manager)
Dirk Proske (BOKU, Department of Civil Engineering and Natural Hazards)
Johann Sölkner (BOKU, Department of Sustainable Agricultural Systems)
Joseph Strauss (Austrian Research Centres and BOKU,
Department of Applied Plant Sciences and Plant Biotechnology)
Benjamin Taubald (Theologian, University of Vienna)
Verena Winiwarter (APART scholar; IFF, Faculty of Social and Economic Analysis;
BOKU, Department of Forest and Soil Sciences)

The university – the last forum for serious debate?

A round-table discussion focussing on the issue of "The Responsible University – commitment to a new culture of debate at the BOKU", organised in conjunction with the production of the second intellectual capital report, 25 April 2006.

Minsch: How important is social debate today? Would you like to make the first contribution, Mr. Proske?

Proske: By "debate", I understand the presentation of points of view with the aim of reaching some kind of agreement. We need agreement because otherwise we cannot act. Debate is of fundamental importance to society.

Strauss: The question is not whether we should debate but how. People end up on opposite sides of great rifts and the potential bridges between the opposing sides are either torn down or never erected, making it very difficult for communication to occur.

Winiwarter: Communication and power are closely linked. This is the old Foucauldian definition of "discourse". What we're talking about is communication across gradients of power. That's what needs to be considered when asking the question, "How does communication occur?". We are talking about who has access to information and the means to communicate. The solution offered by experts is usually objectification. Thus, the question of why discussion takes place without reference to facts is one which has to do with power. The question is that of who has the power to define truth – the power which has been the property of science since the Enlightenment. The new, more uncertain role of the expert remains to be fully explored. It needs to be developed if we want to ask ourselves what role we, as members of an academically trained minority, play in society as a whole.

Kienzl: Who needs to talk to whom and how does this involve universities, which have always been seen as centres for the propagation of science? There has already been a major change. But it is hard for everyone to make this change at once. We need to find a language in which we can talk to politicians, business people and members of the public. We need to think ahead and reach out to those we are researching for.

Minsch: Mr. Kienzl, you are of the opinion that universities market themselves poorly and need to work on their public relations. But that's not really the case. We need not just interdisciplinarity but also transdisciplinarity. This requires me to get out of the university and go in search of the questions we need to be asking.

Winiwarter: PR work only offers a superficial solution to these problems. We hire someone who can write the articles that we can't or don't want to write. In this process, the academic is cast as deficient and lacking. What is needed? The academic system has its own structure of evaluation and reward, which does

not recognise the activity of talking to journalists. If one does talk to them, one does it in one's capacity as a citizen. I don't see why I should spend my free time doing that. I think that the universities are making a cardinal error by ignoring this problem with the reward system and trying to deal with the issue only by means of PR. From reading the intellectual capital report I get the impression that BOKU is using the idea of the "Responsible University" to try to make changes to its own understanding of what academia should be. This requires, however, a reward structure which would reward the fact that we are sitting here now rather than writing papers for journals like Nature or Science.

Taubald: I think the problem is not that the different disciplines have grown so far apart and find it so hard to speak a common language. I think the main problem is rather that our society no longer offers a forum for serious discussion. We do not have media which allow a really urgent discussion of questions about the future which would involve all segments of society. The mass media do not provide this and the various subsystems, such as academia, which cover narrow areas, don't either. The conditions which could allow a university to develop which sees this as its essential task have become even more distant, not least thanks to the politics surrounding the most recent university reforms. The old model was that the debate would be conducted by a minority on behalf of others; the inherent paternalism of this approach is nowadays a little uncongenial and embarrassing.

Minsch: That's the issue. There is no space for social discourse. That presents, of course, a huge challenge: what can we do so that universities are not demanding of society or themselves something which is impossible?

Strauss: The people who are in a position to take over or initiate this debate are the scientific journalists. When I look around and see how much science journalism there is, comparing the size of the sports section of a broadsheet newspaper and that of the science section – the difference is of course even more extreme when it comes to the mass media and television – it seems to me that there is a real lack of awareness. I think that the problem involves raising awareness among journalists, whose job it is to raise the awareness of other people. I admire science journalists, but feel that they do not take their social responsibilities seriously enough. Tabloid newspapers have to scaremonger over issues such as genetic modification as otherwise they will lose readers. Other newspapers say that the whole thing is too complicated, even if they have academics among their readership. No-one understands.

Minsch: That sounds like passing the buck. So we're saying that journalists should do the work. Let's hear from the moral philosopher again…

Taubald: That our society no longer has a fixed system of values, that all social values are in flux, can offer us an opportunity. We are constantly forced to debate and look again at all our ideas about values. This is the point of the democratic system – not in its mass media incarnation and not the way the politicians see themselves. I think it is good that we can't do this easily but rather have to start again from the beginning, as this gives us a chance to overcome the impasse that we often seem to find ourselves in.

Winiwarter: That means that the discussion inside and outside of the sciences is increasingly more focussed on processes and less on facts. And that seems to be what you are suggesting – taking democracy as a process, ethics as a process, quality assurance as a process. We need to promote such processes within BOKU too. We have incredibly well paid researchers doing work with obvious industrial applications and societal impacts, such as genetic technology, and at the same time we


Jürg Minsch


Karl Kienzl


Benjamin Taubald


Verena Winiwarter

have research that is perhaps more socially relevant, poorly paid and still basically state funded. The people sitting in this room represent one group or the other, yet all are counted as BOKU researchers. It is possible to make productive use of this internal conflict. The same applies to the issue of sustainability. It is completely absurd that BOKU has an institute concerned with construction technology when at the same time people like me sit in the Schwackhöferhaus building where the only way to control the temperature in winter is to open the windows. Why? Because the buildings belong to the BIG (Austrian government property agency) – we have no control over them. We need to form alliances with people who will say "we're not giving you any more contracts so long as you have buildings like that." When one looks at such conflict areas, one starts to see why the BOKU's Türkenschanze and Muthgasse location don't always find it easy to communicate with each other – they represent different parts of the academic system. But I think that we need to make use ourselves of this principle of open processes of democratisation and negotiation, and not try to displace the problem to some external forum.

Minsch: That would mean taking on discussion and not delegating it. What does it mean to be a democrat or a citizen at BOKU, or at any university? It means being able to debate, as you said. That means that the responsibility is ours.

Proske: You're right. I think that it's no use trying to create a platform for debate on it's own – it all depends on the will of the people. The people, or the staff – it makes no difference – must be convinced that they want to inform society and that is much more possible than we tend to think. But the whole of society will never all move at the same time in the same direction; rather, there will be a movement here and a movement there. When a relatively large number of people start to act, over a period of time, then something unpredictable will happen, and there may be a chance for us as a university to enter into the debate.

Kienzl: Nonetheless, I think that science needs to lead the way. We at the Umweltbundesamt have entered into a strategic partnership with BOKU because we feel that we are both very similar and yet entirely different, and can achieve much more by working together than either can achieve alone. This applies to many fields, from the political level to project acquisition.

Winiwarter: One of the tasks which it is very hard for journalists to fulfil is agenda setting: putting something at the top of the agenda. When we decide to push an issue, and push together, perhaps working together with partners, we can achieve more. I would prefer that we formed unusual alliances – and the Umweltbundesamt is not unusual enough. A partnership between BOKU and the Bishops' Conference would be much more unusual and get us headlines much more quickly, because everyone would be interested.

Strauss: We've covered a lot of new aspects, but we really need to distinguish between internal and external discourse. Internal discourse, within BOKU and also with partners, whether the UBA [Environmental Agency] or Seibersdorf, takes place in our own forum, with those who share our interests. Transdisciplinarity is what is involved here. The point is not to push through the point of view of the geneticist at the expense of that of the social scientist. I would like to say in passing that I totally reject what was said about well-paid geneticists and poorly paid social scientists. I also find the point about the failure of Türkenschanze and Muthgasse groups to communicate to be a complete exaggeration. There are a few sticking points, but that is so in any organisation. My main concern is with how we communicate with the outside world. When information is lacking, a vacuum forms which is filled by emotions. Scientific communication plays a key role with regards to this "emotionalisation" of the scientific-technical discourse. I don't know how many years "Modern Times" [Austrian TV science show] ran for, but it was always the same story. By the second contribution you knew


Joseph Strauss


Dirk Proske


Johann Sölkner

that the next person was going to say again, ok, we have a problem but scientists at such-and-such a university have now found... and so on and so on. It was always so sensationalist – always saying how wonderful they were and what they had achieved. That's not what communicating with the public should be about. Scientific communication is a responsible task which involves conveying the issues and controversies and providing a platform for debate.

Taubald: No one wants to downplay the importance of science journalism. I just feel that we can't be satisfied with simply saying that science journalism needs to be of a better quality – we need to ask why the public debate about genetic modification has become so emotional. It's not just because reporting is so inadequate, but also because the public seem to feel that there are questions which science cannot adequately answer, because there are issues of what it means to be human and how society sees itself. Geneticists cannot as scientists provide answers to questions of what it is to interact as a human with our non-human environment. Here the debate needs to be embedded in the wider context of our world view. It is precisely such a shared world view – and now we are back where we started – that our society is lacking. We no longer have a shared basis which we can refer to – we need to reach a new understanding of all this. I am not saying anything against high quality, critical scientific journalism, but scientists must also be aware of the limits of their competence, which are also the limits of their disciplines. There is no discipline whose job it is to tell us what the world and humans are. I am a theologian and we believed for a long time that this was our job; philosophers believed the same thing too for a time. Thankfully, no one believes us any more.

Strauss: I failed to make clear at the beginning that what I was concerned with was scientific communication.

Kienzl: We need to hold lively debates, but not in a destructive way – rather in a way that will allow new, creative spaces to arise. And here I believe again that we can and should lead the way. The Bishops' Conference was an interesting example; there are also many other areas which could be thought of where creative space could be created.

Minsch: What could be the topics about which one could hold a civilised debate? One could even argue that there should be no agreement reached – there is no point in reaching agreement. Differing world views and values should be made clear before arriving too quickly at lazy compromises or easy consensus.

Kienzl: A phrase which occurs to me is "corporate culture". Two questions: is BOKU a corporation? And do all the different disciplines here have anything in common?

Strauss: Where does our excellence lie? What are our strengths and what are we good at? We need to look for where excellence occurs, beyond individual disciplines, including in partnerships. We need to set the agenda both within and beyond the university. If we don't research further and if we don't pursue excellence, unemployment will rise in Europe. Yes, that's a large-scale scenario and perhaps I've stated it in a slightly exaggerated form. But perhaps we need things to be exaggerated in order to clarify the issue.

Minsch: To me, as an ecological economist, "excellence" sounds as if it is based on growth. Perhaps such excellence may be of use to us in the short term, but it may put us on a road to facing further problems in the future.

For me, one of the questions we need to be discussing at BOKU is: is continuous growth required for a functioning economy and society, and is such growth possible without placing further damaging demands on the natural environment? Is BOKU itself accelerating such growth? Do we take a holistic view, not just

in discussions but at the heart of our research, teaching and advisory activities?

Taubald: Of course at present we can only carry out high quality science under market conditions. That is a fact at the moment which applies to both the financial situation and the fact that we are involved in a struggle for attention. The task that universities face is of remaining conscious of the situation and discussing it both internally and externally. This can have very concrete results: How is third-party funding dealt with in individual institutes? How is intellectual capital dealt with? In the biotech field, it is normal for research to be carried out with public funding and as soon as a potentially profitable product has been developed for the scientists to set up a company to exploit the profit. Such issues need to be considered. And at the same time we need to increase our external connections.

Winiwarter: BOKU has 14 departments which include very different things – agricultural and pharmaceutical genetic technology, sustainable resource usage and so on. We could be a sort of incubator for this social complexity. This description fits BOKU very well – much better than any other Austrian university that I know of. One could go so far as to say that if forms of communication can be developed here which are open and take us forward, then this could serve as a model for how societies as a whole should deal with such questions. That would be a positive way of dealing with this complexity.

Sölkner: You want in a sense to transfer the debate from society to BOKU and experiment with it there.

Taubald: That must not just happen inside the university or institutions, but must rather involve education. Thus, people would be trained as agents of change, who would be active in society and take up positions of responsibility there. This is why it is important to integrate this in the education process, in the form of a mainstreaming process, integrating this self-reflexion and making it a key characteristic of our graduates. That should be one of BOKU's educational goals following from this discussion.

Strauss: I'd like to add that we shouldn't make the mistake of addressing the issues separately and saying that on the one hand we have strategies for excellence which seek only to make advances and are concerned only with money whilst on the other hand we have careful, self-reflexive people who say that we should or shouldn't do this or that. Excellence is rather an inclusive concept.

Minsch: Does anyone have any final suggestions for what BOKU needs to be doing?

Winiwarter: Reflexivity is a sign of quality in mature institutions, and only a mature institution would want to assign itself the task of being a responsible part of society. But it is one thing to be a "Responsible University" and another to be described as such, and we shouldn't confuse the two. Just because we would like to be one doesn't mean that others will see us in that way. Credibility is probably the most important thing. If we weren't an EMAS certified university, we shouldn't be going in this direction. The question of our ethics of discourse requires input from the academic groups, Senate and Rectorate.

Kienzl: Social knowledge transfer occurs only when there is interaction between the producers of knowledge and its consumers. Coming from another institution, my advice to BOKU is to increase such transfer.

Proske: In the economy, everything is subservient to efficiency. I think we at BOKU should take the long view and say that everything which appears today to be dead weight may in ten years turn out to be a seed from which something new grows. That is

one of the luxuries of universities and is something we should seek to preserve – within limits, of course.

Sölkner: It is in any case sensible and necessary to extend the concept of the “Responsible University” in a number of ways.

Strauss: Our university’s responsibility to support sustainable development means we must develop sustainable technologies which can compete globally and create a sustainable economy. We need to ensure that we are able to afford sustainability.

Service for people – The core processes of the "Responsible University"

Core process: Education and continued education

The University of Natural Resources and Applied Life Sciences, Vienna is still the only university in Austria where the three-stage study architecture has been fully implemented. This first target area of the Bologna declaration is now being given its first practical test: the first students who have completed a regular bachelor's programme graduated in 2005/6. Only after then will it be possible to draw any conclusions on how the new degree is being accepted in the job market. The next stage is to consolidate the curriculum which started in June 2006. The list below sets out the bachelor's and master's programmes on offer.

Bachelor's Degrees

217 Food Science and Biotechnology
219 Landscape Architecture and Planning
225 Forestry
226 Wood and Fibre Technology
227 Management of Environment and Bio Resources
231 Environmental Engineering
255 Agro Sciences
298 Viticulture, Oenology and Wine Marketing
602 Equine Sciences (VMU)/study courses to the extent of around 50 ECTS

Master's Degrees

416 Natural Resources Management and Ecological Engineering
417 Food Science and Biotechnology
418 Biotechnology
419 Landscape Architecture and Planning
422 Phytomedicine
423 Wildlife Ecology and Wildlife Management
425 Forest Science
426 Wood Technology and Management
427 Management of Environment and Bio Resources
429 Mountain Forestry
430 Mountain Risk Engineering
431 Environmental Engineering
432 Water Management
433 Land Management and Civil Engineering
454 Horticultural Sciences
455 Applied Plant Science
456 Animal Sciences
457 Agricultural and Food Economics
458 Organic Farming
459 Agro Biology

Wolfgang Kneifel

It would take several pages to describe what Wolfgang actually does. Instead, a selection of his activities will have to do: research into functional foods as well as optimisation and quality assurance for these products. He is looking into whether foods train our immune system or whether they influence the onset of allergies. Food safety is a further area he is involved in: this is about the microbiological quality of foods and pharmaceutical products and an improved and faster analysis process. With a background in milk research, Kneifel's area of research is now fundamentally important with the globalisation of the food business: his professorship for food quality assurance creates a bridge to human medicine and his research is directly relevant for the consumer.

What is good for the body? What happens to the frequently mentioned pro-biotic foods within the human organism? What consequences does this have for the frequent use of antibiotics to resist bacteria? How long can a product such as smoked salmon be kept? Where are the potential dangers in the food business?

In practice, this is not only relevant for nutritional medicine – a food must also taste good. For this reason, BOKU has a laboratory for sensory and chemical analysis, where a product can be developed and optimised. "From the idea to acceptance by the customer, everything can be developed in this laboratory. This is applied research."

To ensure that this is not limited to research, Kneifel had a significant role in the development of the new BOKU academic programme. "Safety in the Food Chain" has international links and the students are taught in five European universities. Education is close to this active professor's heart. He needs the feedback from students and knows the importance of making the material relevant to real life, as well as presenting it in a lively manner. For over two years, he has supervised over 20 undergraduates, which leaves little time for his hobbies. He enjoys running, jazz, making music, writing rhymes and trying out different types of cooking. This means he is close to food safety again. He is not concerned about bird flu "I trust the vets. But I am sure that there will be similar problems in the future". However, sushi and raw oysters are currently off the menu for Kneifel.

The University of Natural Resources and Applied Life Sciences offers courses, which are largely based on practical experience which means that students in the second stage of their degree programme often undertake relevant work experience. Due to the requirement to be present at university, students often delay progress on their study courses. In addition, for some academic programmes, some courses are envisaged which build on each other whereby failure in some areas can lead to a considerable extension in the length of study *(Table 17, appendix)*. In the short- and medium-term, switching to bachelor's and master's study programmes can shorten the overall length of study, if the first work experience is moved between the foundation and the constructive study programme.

Table 19

Number of students on winter semester due date according to subsection 7 (5) UniStEV 2004 (III.1.5)

		Winter semester 2005			Winter semester 2004		
		Type of student			Type of student		
	Nationality	Degree programme student	Non-degree programme student	Total	Degree programme student	Non-degree programme student	Total
First semester students[1]	Austria	1,038	15	1,053	804	14	818
	EU	206	3	209	159	1	160
	Third countries	100	55	155	54	70	124
	Total	1,344	73	1,417	1,017	85	1,102
Second and higher semester students[2]	Austria	3,599	32	3,631	3,203	28	3,231
	EU	244	7	251	207	22	229
	Third countries	251	69	320	202	58	260
	Total	4,094	108	4,202	3,612	108	3,720
Total number of students	Austria	4,637	47	4,684	4,007	42	4,049
	EU	450	10	460	366	23	389
	Third countries	351	124	475	256	128	384
	Total	5,438	181	5,619	4,629	193	4,822

1 Students admitted to the university in a given winter semester (number of individuals PN according to Appendix 5 of UniStEV 2004).
2 Students who have been admitted to the university for the previous semester (number of individuals PU according to Appendix 5 of UniStEV 2004 minus number of individuals PN).

Table 20

Degree programme students actively taking exams within the minimum duration of studies according to the curriculum and in addition to one tolerance semester in bachelor's, master's and diploma programs in the academic year of 2004/05 (III.1.6)

Nationality	Females	Males	Total
Austria	1,164	1,342	2,506
Other countries	250	201	451
Total	1,414	1,543	2,957

Increasing student numbers

After the number of students bottomed out at 4395 students in the winter semester 2001, explained by the introduction of study fees, numbers have continually grown. Numbers reached 5619 in 2005 *(Table 18, appendix)* compared to 4822 in 2004 – this corresponds to a growth of 16.8% within a year *(Table 19, appendix)*.

This increase in intake can be attributed to students studying forestry and wood and fibre technology, as well as management of the environment and bio resources, which have seen a growth of 50% to 66% in the first semester. The most serious growth was seen in management of the environment and bio resources where student numbers increased by 130 from 196 entrants in the winter semester to 326 in the winter semester of 2005. Educating these students could only be guaranteed with the significant use of external teaching staff, employing teachers especially for this purpose and hiring external spaces. In view of the job market, it is doubtable whether there are sufficient jobs for such a high number of graduates and it is questionable whether continuing the study programme in its current form is sensible. A new curriculum came into effect for the winter semester 2006/7.

Between 2003/4 and 2004/5 the number of students in their first semester increased by 29%, a trend which gave rise to serious capacity problems for the university *(Table 19)*.

Based on the share of female students, the trend of the past five years is continuing in 2005: in this year, the latest increase will bring the share of female students to 43.78% of all students.

2957 out of 5065 students (excluding doctoral students) of the University of Natural Resources and Applied Life Sciences, Vienna took exams in 2005 in at least eight semester subjects and within the envisaged length of study (plus a so-called tolerance semester). This corresponds to 58.4% *(Table 20)*. By excluding those students who in 2005 could take exams in fewer than eight subjects due to their graduation papers (diploma, master's and bachelor's) and if one takes into account the delays to student's progress through the study programme caused by the lack of teaching space for courses requiring intensive supervision, then this percentage appears adequate. It would be beneficial to resolve the space and supervision issues associated with the rapidly increasing student numbers at BOKU in order to reduce the length of study.

The total number of standard study programmes has increased sevenfold, as have the number of students since 2004, and corresponds approximately to the total number of academic programmes *(Table 21, appendix)*. This is attributable to the Austrian system of study which makes non-degree programmes only seem sensible in exceptional cases. A noteworthy percentage (35.3%) of non-degree programme students can be found amongst those from the so-called third countries (non-EU states) which only make up 8.5% of students. This percentage is also decreasing. The use of the ISCED system gives no adequate overall picture of the situation at BOKU and should be reconsidered.

In total, 96 students were admitted to the master's programmes and 67 students to PhD programmes without a corresponding Austrian first degree. The balance between men and women in the master's programmes remains balanced and for PhD programmes male students are in the majority (41 as opposed to 26 women). It is interesting here that out of 163 students, 30 are Austrian citizens who have no domestic degree *(Table 22)*.

Mobility of students (outgoing)

In the winter semester 2005/6, a total of 112 BOKU students have completed a stay abroad. In the winter semester 2004/5, 85 degree-programme students from BOKU were abroad on a mobility programme. This figures show a considerable increase in the outgoing mobility: in the winter semester 2005/6 around a third more students were abroad than in the winter semester 2004/5. If these figures are broken down according to gender, it is clear that female students in both years are more mobile than their male colleagues *(Table 23)*.

Available figures prove that in both 2005/6 and 2004/5 *(Table 24),* the SOKRATES-ERASMUS programme was still the focal point of student exchanges. In both years, the UK and Spain were the most popular destinations; however, since the BOKU-Goes-East-Language-Courses were introduced East-European countries have become increasingly popular. This shows that offering language courses at BOKU is important to promote students' mobility. The BOKU language courses should therefore remain a key part of the academic programmes offered at BOKU. A further goal of the strategy to internationalize BOKU is the structured development of subject-specific learning in specific subjects for each area of study.

BOKU students primarily go abroad to do their diploma work or their dissertation. However, it should be noted that students' interest in living abroad is higher than the figures would suggest. The reason for this is that the guidelines for giving joint study grants have tightened due to budget restrictions and therefore a large percentage of applicants need to be turned down.

With the increase of the joint and double-degree programmes at BOKU, many more students from BOKU will go abroad. Connected with this is the aim of increasing in the long term the budget for international study so that more grants can be given.

A further goal of BOKU is to fully implement the ECTS (European Credit Transfer System) by offering greater incentives for a stay overseas through a more transparent assessment system. A key concern for BOKU is to increase the numbers of outgoing students.

Mobility of students (incoming)

The University of Natural Resources and Applied Life Sciences, Vienna is a favourite guest institution: in the winter semester 2005/6 a total of 153 international students visited BOKU; in the previous year 126 incomings were registered at that stage *(Tables 25 and 26).* This shows that guest students have increased by almost one quarter. Data on incomings prove as with the data on outgoings that female students are more mobile than their male colleagues.

As with the numbers for outgoing students in both years, SOKRATES—ERASMUS is the most important grant programme. The homelands of the guest students show that BOKU considers "Central and Eastern Europe" as the geographical centre piece of the internationalisation strategy in both years. From 126 guest students in the winter semester 2004/5, 63 came from Central and Eastern Europe and in 2005/6 there were 83 from these neighbouring countries. In order to take into account the trend of Eastern European students at BOKU, there is a plan to increase the short and medium-term inclusion of BOKU in the CEEPUS network (Central European Exchange Programme for University Studies). It is mainly Spanish and German students who in both years come from Western Europe to BOKU to study for one or two semesters. Unfortunately, only a small number of students have traditionally come to BOKU as part of an exchange programme. It is, however, very different for the English-speaking master's programmes at BOKU; the Mountain Forestry master's is particularly popular amongst students from third countries.

As these international study programmes are of interest for

Table 23

Number of degree programme students participating in international mobility programmes on due date of November 30 2005 according to UniStEV 2004, *outgoing* (III.1.8)

	Host country								
	EU			Third countries			Total		
Type of mobility programme	Females	Males	Total	Females	Males	Total	Females	Males	Total
CEEPUS	–	1	1	–	–	–	–	1	1
ERASMUS	38	28	66	5	2	7	43	30	73
LEONARDO da VINCI	1	–	1	–	–	–	1	–	1
Other	5	1	6	23	8	31	28	9	37
Total	44	30	74	28	10	38	72	40	112

Table 24

Number of degree programme students participating in international mobility programmes on due date of November 30 2004 according to UniStEV 2004, *outgoing* (III.1.8)

	Host country								
	EU			Third countries			Total		
Type of mobility programme	Females	Males	Total	Females	Males	Total	Females	Males	Total
CEEPUS	–	–	–	–	–	–	–	–	–
ERASMUS	34	17	51	2	5	7	36	22	58
LEONARDO da VINCI	1	1	2	–	–	–	1	1	2
Other	4	1	5	10	10	20	14	11	25
Total	39	19	58	12	15	27	51	34	85

co-operation with partner universities in other key regions of the internationalisation strategy, there is a plan to increase the percentage of English-taught masters programmes by 75% by 2010 across the academic programmes or at least to offer them alternating between German/English.

Table 25

Number of degree programme students participating in international mobility programmes on due date of November 30 2005 according to UniStEV 2004, *incoming* (III.1.8)

	Nationality								
	EU			Third countries			Total		
Type of mobility programme	Females	Males	Total	Females	Males	Total	Females	Males	Total
CEEPUS	–	1	1	–	–	–	–	1	1
ERASMUS	64	31	95	7	8	15	71	39	110
LEONARDO da VINCI	–	–	–	–	-	–	-	–	-
Other	3	2	5	19	18	37	22	20	42
Total	67	34	101	26	26	52	93	60	153

Table 26

Number of degree programme students participating in international mobility programs on due date of November 30 2004 according to UniStEV 2004, *incoming* (III.1.9)

	Nationality								
	EU			Third countries			Total		
Type of mobility programme	Females	Males	Total	Females	Males	Total	Females	Males	Total
CEEPUS	3	1	4	–	1	1	3	2	5
ERASMUS	54	23	77	4	1	5	58	24	82
LEONARDO da VINCI	–	–	–	–	–	–	–	–	–
Other	3	1	4	17	20	37	20	21	41
Total	60	25	85	21	22	43	81	47	128

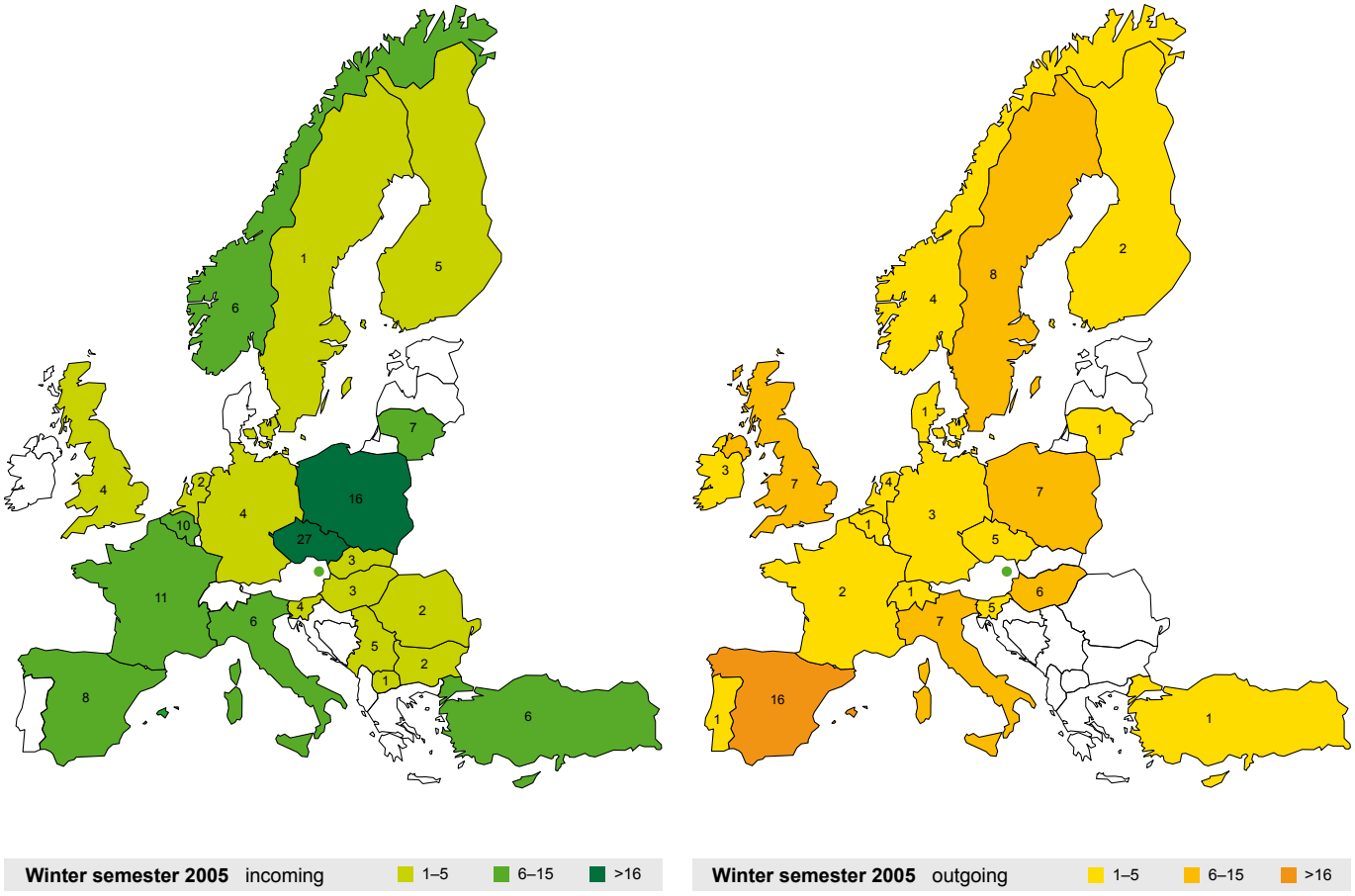

Figure 11

Geographic distribution of students in international mobility programmes

As is shown in the intellectual capital report 2004, a large proportion of incoming students come from Eastern European partner universities, in particular from the Czech Republic, Poland and Lithuania *(Figure 11)*. The number of students from Hungary and Slovakia has decreased. It is noticeable that the number of students from French universities remains high. The number of students from Germany and Spain has decreased. Students from non-European countries come from, inter alia, Bhutan, Ethiopia, Uganda, Canada and the USA.

For the BOKU students who, for example, go abroad with EU education programmes, it is shown in the intellectual capital report 2004 that Spanish universities are the favoured destination in Europe for BOKU students. More than five students were studying at British, Italian, Swedish, Polish and Hungarian universities in the winter semester 2005. If one considers the mobility of BOKU students also beyond Europe, this number of students increases to 13 who as part of the NARMEE master's programme went to the Lincoln University in New Zealand. BOKU students also travel to Australia and Canada.


Elisabeth Schüller


Gerald Siegwart

Students' voices

When did you decide to study at BOKU? Who, if anyone, affected your decision?

Elisabeth Schüller *(Biotechnology following the old curriculum):*
After completing my secondary school leaving examinations. One of my uncles suggested it to me and then I gathered information about the best options.

Gerald Siegwart *(Biotechnology following the old curriculum):*
After college. I worked for a while first and then when I was 23, I began studying at BOKU.

What do you enjoy about your studies? What do you find to be difficult?

Schüller: I think the multidisciplinarity and breadth of study are great. The first semesters were difficult for me because they really focussed on chemistry and I had barely any prior knowledge of the subject.

Siegwart: I like the climate at BOKU. I think the general information provided during the course of study could be better though.

How do you feel about the instructors' supervision and guidance?

Schüller: Very good. If you need something urgently, you can always get an appointment, even outside of office hours.

Siegwart: If it's possible to work together in a concentrated manner, then I'm content.

Do you have any plans to spend a semester abroad?

Schüller: I'm spending next semester in Peru. It's a joint study, free-mover (guest student) program so it's up to me to organise everything.

Siegwart: No, it's too late for that now.

Do you have to work on the side?

Schüller: Yes. First I had a summer internship in one of the laboratories at the University of Technology and now I work there.

Siegwart: Yes, 20 hours a week.

Do you believe that you will be able to find a job immediately after completing your studies?

Schüller: I think so. Internships help you to make contacts. Maybe it won't be my dream job right away but for that you have to be a bit patient.

Siegwart: Yes, I think so too.

What would you like to change?

Schüller: Sometimes there really aren't enough offers for internships. Also, it is difficult to attend classes at other universities because they are overcrowded. This should be regulated somehow.

Siegwart: Sometimes the lecture notes could be more comprehensive.

Core process: Research and development

BOKU's core business in research and development is the acquisition of research funding and thus the implementation of projects within fundamental and particularly application-oriented research on a national, and also extensively on a European level. BOKU continues to expand its knowledge through application- and mission-oriented research, as well as transfer the latest knowledge to student at the university through research-oriented education, in the context of bachelor's, master's and doctoral programmes.

BOKU researchers aim to be up to date and to identify recent research trends, while also taking societal, political and economic needs into account. Through intensive research and by adding new staff financed by external funding and largely employed on a permanent basis, results, solutions, concepts and models, such as for the protection of vital resources and habitats in a sustainable manner, can be generated for citizens, but also for the economy and industry by developing new products and methods.

Research staff

Table 27 demonstrates the high potential of academic staff funded through the global budget. The enormous project acquisition *(s. below)* nearly doubled the number of staff, adding staff financed by third-party funded R&D projects. For third-party funded staff the percentage of females reached almost that of their male colleagues. Thus, in the medium-term, we hope for young researchers to increase the percentage of female staff with and without a post-doctoral teaching qualification.

Table 27:

Overview of BOKU's academic staff (full and part time basis) (listed as full time equivalents)

	2005		
Full and part time staff (full time equivalents)	Females	Males	Total
Total number of scientific and art staff[1]	315.0	568.1	883.1
Professors[2]	8.0	51.8	59.8
Assistant lecturers and other scientific and art staff[3]	307.0	516.3	823.3
including lecturers[4]	21.3	100.5	121.8
including staff financed by thrid-party R&D projects[5]	193.6	228.1	421.7
academic staff without a post doctoral teaching qualification[6]	92.1	187.7	279.9

1 functions 11, 12, 14, 16, 17, 21, 24, 25, 30 according to subsection 2.6 of Appendix 1BidokVUni.
2 functions 11, 12 according to subsection 2.6 of Appendix 1BidokVUni.
3 functions 14, 16, 17, 21, 24, 25, 30 according to subsection 2.6 of Appendix 1BidokVUni.
4 functions 14 according to subsection 2.6 of Appendix 1BidokVUni.
5 functions 24, 25 according to subsection 2.6 of Appendix 1BidokVUni.
6 functions 16, 17, 21, 30 according to subsection 2.6 of Appendix 1BidokVUni.

Sabine Rosner

A spruce tree branch that has been fixed in place with a clamp and is surrounded by wires and monitors is lying on the laboratory table in Sabine Rosner's small room. It looks a little bit like esoteric torture. In an effort to unlock the secrets of the wood, acoustic sensors measure the ultrasonic signals it emits while desiccating. Rosner's work focusses on the spruce tree – a tree which is of the largest economic importance in Europe. The manufacturing industry wants the trees to be as uniform as possible but nature does not play along with these expectations. This is because the trees are prone to "spiral growth". This is undesirable but is however important for channelling the flow of water in the tree. Furthermore, the wood of the spruce tree is not uniform; its structure at breast-level differs significantly from the wood near the top of the tree. How biological functions relate to a specific anatomy is thus fundamental. The question arises however regarding the extent to which the mechanical and hydraulic processes which guarantee the survival of the tree suffer when cloning is used to develop specific wood properties and force maximum growth. This is being attempted at present in Sweden, for example. Uniform structure and higher growth will probably not allow for as much resistance to dryness or stability in the face of wind or snow.

Working on a project basis, Sabine Rosner performs anatomical and chemical analyses in conjunction with hydraulic and technical tests in order to see how these parameters determine wood quality. Knowledge of the processes that occur during water loss could also provide valuable information for processing the wood. Drying methods could then be adapted accordingly, once more is known about the inner life of the wood.

Working in an interdisciplinary manner is of particular interest to the diplomed forest scientist. She already had experience doing this during her studies as she always found the straightforwardness of BOKU to be a major advantage. It seemed to her that plant physiology was a more predictable subject to study. For that reason, she was more inclined to deal with botany than with forest entomology since "you never can tell what insects will do." Born in Upper Austria, Sabine is an autodidact when it comes to her hobbies. Her watercolour painting and love of the South complement each other well.

BOKU areas of research and expertise

The university's research domains are widely diversified: they range from the natural sciences and engineering all the way to socioeconomics. BOKU is the only university in Austria that has the capability to comprehensively research extensive topics with wide-reaching effects. Individual topics range from fundamental research to applied research.

Innovative research continues to unfold, wherein problems and needs relevant to society are tackled. This is coupled with an increase in expertise within each discipline that is clearly visible from the outside, and interdisciplinary networking. BOKU is ready to meet this challenge with its new departments and is able to contribute to said areas of expertise, aiming to promote the development of Austria as a research location.

In response to the internationally defined goals that were set at the millennium, the university would like to strengthen its role in helping to solve global problems. BOKU is in a position to make substantial contributions in the direction of resolving of these

Sabine Klepsch

Sabine Klepsch was always interested in maths unlike many of the girls who studied physics with her at the Vienna University of Technology. “But of the few who did study it, most pulled through to the end”, Sabine told us. Her first contact with BOKU was via the Institute of Hydraulics due to their shared use of a simulation package. She is funded by a cooperative project with the ARC Seibersdorf and her work deals with the many facets of mass transfer in soil. Her main research focusses however on modelling the movement of substances in soil. This can include metals such as copper, cadmium and zinc, radionuclides, and even pesticides and other plant protection agents. With the right amount of know-how, simulations can be used to estimate the risk potential of pollutants. “The behaviour of such substances is very complex”, explained Klepsch, “it is dependent on specific physical, chemical and biological factors.” Soil represents not only an essential “drain” for substances in the environment but it also serves to transfer nutrients, as well as pollutants, to plants; these are in turn carried further down into the groundwater. What is important within this particular context is the influence of the plants. Klepsch became involved with rhizosphere research at BOKU in order to learn, among other things, what plants absorb and excrete as well as how the relevant processes can then be modelled. With the use of data gathered by colleagues, Klepsch tests models that attempt to replicate the physical and chemical processes. Another core area of research is soil absorption processes. In this case, molecular level simulation results are utilised in order to investigate the macroscopic absorption properties of soil with the use of adequate techniques. The necessity for expensive and dangerous experiments which require the use of toxic substances can be decreased in this way. Furthermore, Klepsch, who was formerly accustomed to mathematic terminology, must now employ a combination of chemistry and biology lingo. She is sociable and it is likely for that reason that she is a popular choice when it comes to convention organisers. She would like to be in a larger workgroup. She is involved in music-related activities in her free time. Her hobbies of singing, piano-playing and sailing form a tangible counterpoint to the simulated computerised world of her research. Sabine Klepsch does not spend all of her time just looking at the ground however. To balance things out, she possesses an active interest in astronomy; hanging in her office are pictures of Mars.

problems due to the practical nature of its traditional themes like sustainability, resource-oriented technologies, land and water management, and food- and biotechnologies. The university aspires to be the leading authority in the following six areas:

- Soil and land ecosystems
- Water, atmosphere, environment
- Habitat and landscape
- Renewable resources and resource-oriented technologies
- Food, nutrition and health
- Biotechnology and nanobiotechnology

Hermann Bürstmayr

Bürstmayr, a native Upper Austrian, studied agriculture at BOKU. Early on, he began concentrating on plant breeding and genetics. “The first time I really got into it was during my residency at the Plant Breeding Institute in Cambridge”, Hermann Bürstmayr told us. After completing his studies, it was time to apply what he had learned. Bürstmayr first gained some professional experience at Saatbau Linz before returning to BOKU to work as a researcher. After filling in awhile as a replacement, he was then funded for a number of years by FWF (Austrian Science Fund) projects because he absolutely wanted to continue his work in the area of breeding research. “This time in my life wasn’t very easy since I already had a family to think about and the constant instability was very tiresome. Now the situation for young people is absolutely catastrophic. An already bad system has been replaced by another that is even worse.” Bürstmayr has also noticed this within his small team of five to eight workers at IFA-Tulln. “They are all financed by third-party funding. If they weren’t so highly motivated, they wouldn’t be doing this since there is little prospect of ending up with something more long-term. They are poorly paid and yet work much more than they would elsewhere.” Bürstmayr sees it as his responsibility to motivate the team and raise funds. In this case, “the FWF is a great sponsoring institution since politics have little voice in the decision-making there”.

His field of study is the resistance of grain crops to fungal diseases. There are approximately 20 different types of fungus which can cause disease in wheat, barley and corn. The loss of crops and harmful mycotoxins in foodstuffs are the result. There are in fact effective cleaning methods and detoxifying animal feed additives in Europe. However, every ten years or so, certain weather conditions can nevertheless spur the onset of these fungi. At IFA, conventional and molecular genetic methods are used to characterise the resistant genes already present in several wheat types and then develop these genes for practical use in breeding. “Whatever pertains to fusarium research is of relevance to us. And by that I mean our entire team – the world’s vanguard.” Bürstmayr received confirmation of this from the world’s largest wheat research institute, which is located in Mexico. Since wheat adapts to its local conditions, seed companies are not able to secure a monopoly over fusarium-resistant wheat types. “Above all, old species found in the wild in Asia are of significant importance”, pleaded Bürstmayr in reference to the preservation of genetic diversity and regional varieties.

Project acquisition

By analysing BOKU researchers’ project acquisition from last year in accordance with Code III.2.2 (Intellectual Capital Report Act), it is possible to conclude that a large part of the revenue comes from third-party funding. In 2005 alone, it was possible to procure more than 200 additional research projects on both the national and European levels (*Table 28*). BOKU researchers worked on at least 570 projects in 2005 and on approximately 369 projects in 2004.

Funding providers were classified according to a classification system procured for by the department for national economy at Statistics Austria. Here, public non-financial corporations that pertain to the public sector outside of the state sector were presented as a separate group, opposed to the structural requirements of the Intellectual Capital Report Act, versus classifying them according to corresponding local authorities or corporations.

Table 28

Number of projects within research and development from January 1st 2002 onward supported by third-party funds (III.2.2)

Contracting/sponsoring organisation	2005	2004
EU	79.0	55.3
Federation	143.8	95.0
including ministries	118.8	78.9
Province	57.3	28.4
Municipalities and local authorities	20.9	10.1
Authorities in the public sector outside of the government (according to Statistics Austria)	19.3	11.1
FWF	58.0	53.0
Other funding institutions primarily sponsored by federal funds	14.2	6.2
Corporations	93.4	56.8
Legal representations of interest	7.3	4.6
Foundations and other sponsoring organisations	14.7	12.8
Other	62.2	35.6
Total	570.0	369.0

1 Classification of sponsors in the public sector according to the classification provided by Statistics Austria (national economy, allocated funding)

When compared with the intellectual capital report 2004, it is to be considered that here the due date of January 1, 2002 was chosen as the basis of the analysis; based on the assumption that the budget indicators in the research database were all listed in euro after this date. Furthermore, no research projects that were funded internally were included in third-party funding resources. Long-term research projects and educational projects funded via educational programmes of the European Commision were not included either.

In 2005, it became apparent once again that aside from the European Commission and the Austrian Science Fund (FWF) particularly local authorities, and especially the Federation, were significant research commissioning parties for BOKU. The European Commission funded 14 % of all research projects in 2005, while the Federation financed even one quarter of them, particularly in response to the major success of BOKU researchers at the 5th and 6th EU Framework Programmes. Provinces and municipalities financed another 14%. Commercial and industrial enterprises also play an important role for BOKU. Companies of all sizes from across the nation contract or cooperate with various scientific institutions at the University of Natural Resources and Applied Life Sciences. Approximately 16% of research projects are funded by national and international corporations.

Table 29

Number of ongoing R&D projects in 2004 and 2005, initiated from January 1st 2002 onward and financed by third-party funding[2] (III.2.2)

	2005			2004		
Contracting/sponsoring organisation	GLF	AF	EE	GLF	AF	EE
EU	13.3	64.8	1.0	10.0	44.3	1.0
Federation	20.6	122.3	1.0	13.0	82.0	–
including ministries	17.6	100.2	1.0	11.0	67.9	–
Province	2.3	54.0	1.0	1.0	26.4	1.0
Municipalities and local authorities	0.3	20.6	–	–	10.1	–
Authorities in the public sector outside of the government (according to Statistics Austria)	1.6	17.7	–	1.0	10.1	–
FWF	53.0	5.0	–	46.0	7.0	–
other funding institutions primarily sponsored by federal funds	3.0	10.2	1.0	–	5.2	1.0
corporations	11.0	72.4	10.0	8.0	40.8	8.0
Legal representations of interest	2.0	5.3	–	1.0	3.6	–
Foundations and other sponsoring organisations	5.3	9.3	–	4.0	8.8	–
Other	7.7	54.5	–	3.0	32.6	–
Total	120.0	436.0	15.0	87.0	271.0	11.0

1 Classification of sponsors in the public sector according to the classification of Statistics Austria (national economy, allocated funding)
2 Type of research: FR (fundamental research), AR (applied research), ED (experimental development)

As was already reported in the intellectual capital report 2004, the majority of the research performed at the University of Natural Resources and Applied Life Sciences is classified as application-oriented (approx. 81%). The remaining 19% is almost entirely dedicated to fundamental research. In principle, only a negligible portion of it is classified as “experimental development”.

When correlating the different types of research with the organisations that sponsor them *(Table 29)*, it comes as no surprise that projects financed by FWF (Austrian Science Fund), for example, are mainly in the area of fundamental research. However, also to be considered are the new FWF support programmes which are connected by the programme BRIDGE to funding from the Austrian Research Promotion Agency (FFG). This is indicative of a move away from fundamental research and a step towards application-oriented research. The programmes have already received the initial classification of application-oriented research. Clients like business institutions and sponsors such as the federal government and the EU primarily fund research projects whose focus is predominately application-oriented.

As the classification criterion “type of research” is only assigned to research projects on an “either-or” basis, an update of the research database would be advised. All types of research should

Dipl.-Ing. Klaus Fischer
Honorary member of the Senate of the University of Natural Resources and Applied Life Sciences, Vienna

www.fischer.co.uk

"Outstanding achievement deserves recognition"

Your reaction to the BOKU's first intellectual capital report was very positive. What was it that you liked about it?

We in industry are of course very familiar with the idea of keeping capital accounts. At the same time, our firm places great emphasis on the continuous improvement of processes by use of figures and data. We achieve this by means of the Fischer Process System. An intellectual capital report, which first records the university's key capital, which is of course intellectual capital, and then goes on to use this as the basis for continual development and improvement, is thus something which fits perfectly with our business philosophy.
As a result, I was very impressed to see BOKU being the first Austrian university to meet its obligations under the new Universities Act and publish its intellectual capital report ahead of the deadline in 2006. It is impressive to see how the report defines processes in a similar way to industrial processes and incorporates all of them into a holistic context – the "cycle of science-based value creation".

Why did you decide to work together with BOKU, and what form does this co-operation take?

BOKU is one of the leading universities in the field of construction engineering. Our partner, Professor Bergmeister, is an expert with a great deal of experience in not just the field of construction and structural design but also in our field of adhesives. Of particular importance to us is the link between research and practice, which is something that Professor Bergmeister, as an engineer, is able to provide. In addition, IKI has worked for us for many years as an advisor on regulatory issues.

Universities and industry have different cultures – what can they learn from each other?

In my view they should come together from what are sometimes opposing directions. The university comes from the direction of pure research and education, which sometimes means not knowing the results of what their work will be. Industry, on the other hand, is purely result- and profit-orientated. As is so often the case, we need to take the positive and constructive aspects from each approach. That means taking from universities free and creative research in a yet unchartered territory, daring to work in "white spaces". And from industry we need to take the structured processes, the discipline which allows aims and tasks to be defined and progress to be monitored.

What was the motivation for your setting up the Klaus Fischer Innovation Prize, which has been awarded to BOKU students and members for many years now?

We wanted to reward achievement. Outstanding achievement and results in the field of research deserve recognition. And this recognition – along with an additional motivational push – is just what I seek to provide to a student once a year with the prize.

What do you see as BOKU's potential for development, and what do you hope for from its students?

The intellectual capital report, which BOKU was the first Austrian university to produce, has already put ahead of the pack. And that's just what I call potential: going further than the others. BOKU needs to be innovative and flexible, showing the way to the future in terms of both content and structure.

What I say to the students is that they should seize with both hands the opportunity that the university is offering them. No one can take away from them what they gain from this time and these experiences. Knowledge is a key, if not the key, deciding factor for their futures.

be listed according to the percentages of respective projects. This would allow for a combination of fundamental and application-oriented research, such as is encouraged by certain programmes, also for the documentation of projects. Such a development would open up new perspectives for the analysis of funding organisations, programmes or even strategic considerations within the university.

BOKU in the 6th EU Framework Programme

BOKU's success in the 6th EU Framework Programme has continued to grow, in comparison with the intellectual capital report 2004, during 2005, as can be seen from the evaluations published by PROVISO on the homepage of bm:bwk, the Ministry of Education, Science and Culture (3/2006; Dinhobl, G., 2006) in June 2006. It should be noted that, according to PROVISO, all proposals from the previous year (up until November 2005) were evaluated.

Thomas Rosenau

As son of two “unmusical German teachers, who had nothing to do with science”, Thomas Rosenau nonetheless gained a diploma as a concert organist and then went on to study chemistry at the Technical University, Dresden and graduate “summa cum laude”. He won’t deny that it’s possible that it was out of youthful rebelliousness that he developed such different interests to those of his parents. On a research visit to North Carolina State University he got to know Prof. Gratzl, an Austrian academic who put the young scientist in touch with the chemical firm Lenzing AG. Subsequently, Rosenau joined BOKU as an assistant professor and member of the CD Laboratory of Pulp Chemistry at the Institute of Chemistry. Since 2006, Rosenau has been the Professor of Wood, Pulp and Fibre Chemistry, which also involves the chemistry of renewable resources. Rosenau is closely associated with the underlying scientific disciplines: “They are important. We have to hope that the FWF, which is the only institution funding fundamental research in this field, remains.” He adds: “One needs to remember that although the processes which dissolve the cellulose structure have been used practically for many years, we still have no idea what happens at the molecular level”. His speciality of cellulose chemistry, antioxidants and cellulose fibres require some explanation. Antioxidants such as vitamin E are involved in human medicine as absorbers of free radicals, but what is astonishing is that the same mechanisms can prevent the ageing and discolouring of paper. Vitamin E can also be used in the transportation of chemicals in cells, which is being investigated in co-operation with the pharmaceutical industry. And “intelligent fibres” can release specific chemicals, absorb harmful ones, conduct electricity or be used in protective clothing.

Rosenau is also interested in so-called “green chemistry”. This refers to technical processes that help to protect the environment, such as the use of water instead of toxic solvents, catalysts which reduce the energy required for reactions or the replacement of dangerous and harmful chemicals with less damaging ones. The international prizes won by the young scientist from Eisenach show that he and his team are on the right track. He and his wife, who is also a chemist at BOKU, have come to feel at home in Vienna. He gets little chance nowadays to play the organ, but chemistry can be a creative pursuit too. “New applications and new materials are what is so great about chemistry, because you have something concrete in your hands which you contributed to the development of.”

Over the past twelve months, BOKU has succeeded in acquiring a further 32 projects *(see Table 30)*. In addition, without taking into account the successes of the IFA-Tulln (Inter-university Department for Agrobiotechnology) (a total of three successful collaborations, with a 0.5% share) or of the Centre for Social Innovation (a total of five successful collaborations, with a 0.8% share) which BOKU is involved in, as shown in PROVISO’s current analysis, BOKU managed to defend its third place position in the Austrian university and college rankings. This achievement is even more remarkable considering the size of BOKU and its low level of staff funding from central government in comparison to other universities (see intellectual capital report 2004).

It can also be noted in comparison with the intellectual capital report 2004 that in 2005 the small and specialised BOKU was able to achieve the impressive feat of being the most successful coordinator of all universities, coordinating a quarter of all those projects coordinated by Austrian universities within the 6th EU framework programme *(see Table 31)*. Taking into account

Table 30:

Number of successful participations of Austrian universities in the 6th Framework Program (as of 03/2006; PROVISO, bm:bwk)

List of participating universities Programmes	Successful participations	2005 Percentage (%)[1]	2004 Change
Vienna University of Technology	113	18.3	+39
University of Vienna	89	14.4	+31
University of Natural Resources and Applied Life Sciences Vienna[2]	72	11.7	+32
Graz University of Technology	61	9.9	+23
Medical University of Vienna	44	7.1	+17
University of Innsbruck	41	6.7	+17
University of Linz	37	6.0	+20
University of Graz	29	4.7	+7
Innsbruck Medical University	23	3.7	+9
University of Salzburg	21	3.4	+10
Medical University Graz	11	1.8	+5
University of Leoben	10	1.6	+4
University of Veterinary Medicine Vienna	5	0.8	+1

1 Percentage refers to all participations of Austrian universities and universities of applied sciences
2 excluding IFA-Tulln

Data source: European Commission
Calculations and data processing: ©PROVISO, a project initiated by bm:bwk, bmlfuw, bmvit and bmwa

the size of the university, and in particular the number of staff members (see intellectual capital report 2004), this feat is even more impressive.

Only when it comes to the number of successful guest invitations, i.e. Marie Curie arrangements, which involve an external researcher working at an Austrian host university on a research project, has success so far eluded BOKU. To date, BOKU has managed to attract two such stipendiary researchers. When the University of Vienna is discounted, which has to date attracted 13 stipendiary researchers, the number of Marie Curie stipendiary researchers attracted by Austrian universities ranges from one to a maximum of three. According to PROVISO, it is an unfortunate Austrian characteristic that to date, overall and regardless of the type of institution (university, college, business etc.), this type of resource (acquisition of stipend funding) is far too rarely taken advantage of. This programme would allow international recipients of stipends to, along with excellent funding, be brought to the organisation, which would ultimately result in a higher output of scientific results.

Table 31

Number and percentage of all coordinators of Austrian universities selected to participate in the 6th Framework programme (as of 03/2006; PROVISO, bm:bwk)

	2005	
List of participating universities Programmes	Number of successful coordinators[1]	Percentage (%)[2]
Vienna University of Technology	9	15.3
University of Vienna	10	16.9
University of Natural Resources and Applied Life Sciences Vienna[2]	14	23.7
Graz University of Technology	3	5.1
Medical University of Vienna	4	6.8
University of Innsbruck	6	10.2
University of Linz	4	6.8
University of Graz	2	3.4
Innsbruck Medical University	1	1.7
University of Salzburg	1	1.7
Medical University Graz	–	–
University of Leoben	1	1.7
University of Veterinary Medicine Vienna	1	1.7

1 Marie Curie measures: only host driven actions; Euratom: excluding training fellowships
2 Percentage refers to programmes of all successful coordinators of Austrian universities and universities of applied sciences
3 associated with BOKU

Data source: European Commission
Calculations and data processing: ©PROVISO, a project initiated by bm:bwk, bmlfuw, bmvit and bmwa

Taking a look at the various subprogrammes included in the 6th Framework Programme, BOKU's successful involvement in the areas of the environment, international co-operation, food and biotechnology are particularly noteworthy *(Table 32)*. It is also to be noted that in the past year BOKU researchers were able to increase the amount of co-operation on projects with small to medium sized businesses (an increase of five).

Also to be noted is that in this year's evaluations, the IFA-Tulln, as one of BOKU's 14 departments, has been treated separately, for reasons of the high level of co-operation with the Veterinary University of Vienna and the Technical University of Vienna. The department succeeded in having three further projects in the fields of food, energy and international cooperation awarded. The Centre for Social Innovation (ZSI), which is associated with BOKU, has been able to acquire five projects to date, one in each of the programmes for technology in the information society, international co-operation and promotion of political development and two in the ERANET programme.

Table 32

Number of successful BOKU participations in the 6th Framework Programme (as of 03/2006; PROVISO, bm:bwk)

Programmes	2005	Changes compared to 2004
Life Sciences, genomics and biotechnology for health	9	+4
Information society technologies	5	–
Nanotechnologies and nanosciences, knowledge-based mutlifunctional materials and new production processes and devices	2	–
Food quality and safety	8	+2
Sustainable development: Sustainable energy systems	3	+1
Sustainable development: Sustainable surface transport	2	–
Sustainable development: Global change and ecosytems	15	+5
SSP	6	+4
Horizontal research in co-operation with small and medium-sized enterprises	7	+5
International co-operation activities	10	+6
Research and innovation[1]	1	n.d.[2]
Education and mobility of researchers	3	+1
Science and society	1	–
Total	72	

1 PROVISO has not received complete information regarding this programme.
2 not listed

Data source: European Commission
Calculations and data processing: ©PROVISO, a project initiated by bm:bwk, bmlfuw, bmvit and bmwa

Doctoral students

Between 2004 and 2005, the number of doctoral students rose by 11.5% from 494 to 551. The majority of the increase is accounted for by an increase in the numbers of foreign students *(see Tables 33 and 34, in appendix)*. The numbers of people receiving preliminary approval to begin doctoral studies at BOKU rose by 41, an increase of 44%. These developments show that BOKU is increasingly attractive to young scientists around the world.

No PhD doctoral studies were being undertaken at BOKU during the 2005 winter semester. The number of doctoral students who graduated from universities of applied sciences (Fachhochschule) is still, at five, very low, and is limited to those who attended the Fachhochschule Kuchl.

New Modes of Governance for Sustainable Forestry in Europe (GoFOR)

In December 2004, the Institute of Forest, Environmental and Natural Resource Policy started the "New Modes of Governance for Sustainable Forestry in Europe" (GoFOR) project, which receives 1.8 million euros of funding. The management and coordination of the research, which is planned for a three year period, is the responsibility of Prof. Karl Hogl and Dr. Michael Pregernig. The international project, which involves partners from ten European countries, considers new forms of political control in the fields of forestry, environmental protection, regional and sustainability policy in Europe.

The GoFOR research team consists of around 25 scientists from leading forestry and environmental policy institutes in Germany (University of Göttingen), Denmark (Royal Veterinary and Agricultural University), France (Ecole Nationale du Génie Rural, des Eaux et des Forêts), Greece (National Agricultural Research Foundation), the Netherlands (Universität Wageningen), Norway (Møreforsking),
Romania (University Stefan cel Mare Suceava), Spain (Forest Technology Centre of Catalonia) and Hungary (University of Sopron).

Sustainable forest management as a political goal

The protection and sustainable management of forests have been accorded great importance at least since the United Nations Conference on Environment and Development (UNCED) in Rio in 1992, where a legally non-binding declaration (Statement of Forest Principles) was agreed, and the advent of the Ministerial Conference on the Protection of Forests in Europe (MCPFE), which has met regularly since 1990. "National Forestry Programmes" represent a key component of the implementation of both international obligations and national goals; these are country specific policy and planning frameworks which seek to promote sustainable forest management. Despite the perhaps misleading name, National Forestry Programmes do not represent fixed plans which set down aims to be later implemented but rather a deliberative process which is in principle open to all those with an interest in the issues surrounding forestry management.

Governance as a new principle of political control

In the literature of political science, the need for a new approach to planning is discussed with the concept of "governance". Against the backdrop of a fundamental change in the relationship between the state and society, an increasing shift from hierarchical modes of control to more cooperative forms can be observed – a shift from government to governance.

This phenomenon of governance is associated with a series of political and normative principles, which are dealt

with in an empirical way by the GoFOR project. A primary principle is that of participation, which requires partnership and co-operation of all involved on an equal basis. Both state and, in particular, non-state actors should be involved in the decision-making process. Further principles include those of inter-sectoral co-operation, in the sense of agreement on processes and activities in various "neighbouring" scientific fields; multilevel control, the controlled integration of various levels of political decision making (EU, national, regional, local); the principle of adaptive and iterative policy making, which see policy making not as a single act of target setting but rather as a repeated process of approximation; and the principle of responsible expertise, which requires the integration of the best available knowledge whilst also taking into account social plurality and ethical integrity.

GoFOR offers help with political decision-making

The idea of governance is a component of many policy programmes and has already found its way into forestry policy. Interestingly, there is as yet still no broadly based scientific research into the extent to which ongoing processes and programmes can meet the demanding requirements of governance or whether the "new forms of control" will instead remain mere political rhetoric.

GoFOR is making a first attempt at a comparative analysis and systematic evaluation of governance processes in ten European countries. Building on twenty detailed case studies, the research project is seeking to make a contribution to the understanding of fundamental structures underlying policy making processes in the fields of forestry, environmental and resource politics, and to provide relevant conclusions and recommendations for those responsible for making decisions regarding forests and the environment in the worlds of politics and business nationally and internationally.

Contact:

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Core process: Societal and economic development

By service provision BOKU understands primarily those activities which, in addition to education and research, are expected by external customers or clients on the basis of social needs or in return for payment (commercial service provision). Internal service provision, i.e. services meeting the university's own needs, should also be borne in mind. Service provision offers BOKU, in combination with its application-orientated research, great opportunities. The guiding principle is that external service provision should not be offered for its own sake but rather always be seen in the context of research and education.

BOKU also, however, sees external service provision as making an important contribution to the meaningful transmission and application of knowledge. This can occur in a number of different ways, whether as the exploitation or patenting of the results of contracted work, or the investigation of economic and industrial applications. Service provision to the scientific community, such as reviewing for journals, carrying scientific evaluations (without payment), the organisation of conferences and active participation in international networks are not new, but these activities should in future be supported in a targeted way and be used as criteria in internal target agreements (e.g. participation in scientific boards of recognised academic journals).

Exploitation of the fruits of research

In 2005, BOKU continued to develop its activities regarding the professional marketing of research results, with the support of the Vienna Business Agency and the uni:invent programme. The activities range from giving preliminary advice on new ideas, looking for partners and help with contract negotiation and agreement to the patenting of innovative research results and founding companies.

Happily, ever more BOKU researchers are taking advantage of the support of the research support office in negotiating and agreeing contracts. This not just ensures that the researchers' remuneration is clearly defined, but also that in some cases the exploitation rights are able to be retained to a greater extent by BOKU.

The new legal framework provided by the Universities Act 2002 enabled the first steps to be taken towards the setting up or hiving off of external organisations. In co-operation with the INiTS AplusB centre, the first information event dealing with this issue was held and great interest was shown in the INiTS award 2005, which was awarded to innovative dissertations and theses which have a chance of becoming economically valuable.

Serving the scientific community

BOKU researchers are in addition engaged in reviewing for national, European and international funding providers. In 2005, at least 35 BOKU researchers were engaged as reviewers to funding bodies such as e.g. the German Research Foundation, the Czech Funding Foundation, the Swedish National Foundation for the Promotion of Scientific Research and the European Commission.

One of BOKU's central concerns remains to involve more of its researchers in project evaluation in Brussels and make them available for reviewing activities there. BOKU is of the opinion that increased activity in this field could reduce the drop-out rate of projects in certain fields and could improve further European and international links. In addition, BOKU scientists serve on peer evaluation panels.

A further important service provided is the organising of international and national conferences, whether aimed at discussing the results of research within the scientific community or at facilitating knowledge transfer to enable its application

Dagmar Grimm-Pretner

Her family would have preferred their daughter to have studied something rather more solid – medicine, for example. Dagmar Grimm-Pretner, however, had always been interested in design and chose to study the then new subject of landscape ecology and design, which was at that time not a standard combination.

Her research centres on the design and use of free space and the processes which shape its appearance. This is thus an area of research which affects all of us – on the one hand "free space" is public space which is used by people from a range of cultural backgrounds, and on the other hand "free space" can be a private refuge. She brings with her a great deal of practical experience – her past work includes working with the Arge Grün landscape gardeners, being responsible for the redevelopment of the Ottakring district of Vienna and working as a freelance landscape architect.

At present she is heading a project which involves working together with town planners, landscape architects and sociologists from Bulgaria, Macedonia and Austria to investigate the potential of public open space, focussing on the possible conflicts which may arise over its maintenance and development. "In Sofia and Skopje, the conditions for the development of open space are very different to those we work in", she says. "Especially in former communist countries, the effects of the privatisation and restitution of public space are huge and lead to rapidly increasing qualitative and quantitative losses. The aim of the co-operation is to develop new approaches and strategies which support the sustainable development of public space and make a contribution to improving the quality of life."

A precondition for good design in a well thought out approach to space and its use. When an area of a town changes, a site must be able to respond in a flexible way so as to adapt to the requirements of the residents.

Along with her eight-person team, Grimm-Pretner too displays great flexibility, combining with other working groups in accordance with the demands of each project. The designer, who was born in Styria, has one wish which she asks of BOKU: that it work to increase co-operation between different speciality. This requires the right conditions to be in place – not least people who are prepared to recognise and realise new potential.

or to pass it on to practitioners or interested members of the public. BOKU researchers are involved in the organising of such events and in offering their expertise through work in organisational and scientific committees. At least 75 BOKU researchers were in 2005 in charge of or involved in organisational committees dealing with national and international conferences and symposia. In 2004, at least 60 researchers were involved in working on behalf of scientific events.

Donations for social causes

In 2005, the BOKU staff association organised a fund raising campaign in reaction to the tsunami catastrophe. The monies raised were passed on to Médecins Sans Frontières. In addition, the Rectorate of BOKU has since 2004 decided not to send Christmas post and has instead been donating the money saved, together with the funds raised by other Christmas activities (e.g. the sale of punch), to help children suffering from epidermolysis bullosa.

Ecological responsibility

Systematic environmental management

As the logical next step following its many years of engaging in environmental issues, BOKU has introduced an extensive environmental management system (EMS) to further professionalize and expand its environmental activities.

System boundaries
The environmental management system encompasses all buildings and facilities at the Türkenschanze and Muthgasse locations, with the exception of the following entities which are run by external organisations: BOKU Kindergarten, Türkenwirt facility, cafeterias.

Sites which are not at present included within the environmental management system include the Knödelhütte forestry research nursery (1140 Vienna), the fruit growing research nursery (1210 Vienna), the Raphael-Donner-Allee Essling site (1220 Vienna), the IFA-Tulln (Inter-university Department of Agrobiotechnology, 3430 Tulln), the Agricultural Research Site (2301 Großenzersdorf), the Forestry Teaching Centre, Heuberg (7217 Forchtenstein) and the external Seehof 4 site (3293 Lunz am See).

The environmental management system will be extended to cover all BOKU sites from 2007 onwards.

Environmental organisation
Protecting the environment is the responsibility of all members of staff. To ensure that all necessary tasks are carried out and that the environmental management system functions as it should, special duties and responsibilities are clearly defined in our organisational structure, including the EMAS management representative, the environmental manager (EM), the environmental contact person (ECP) and the environmental team.

Environmental protection processes
A prerequisite for continual improvement of our environmental performance is a functioning environmental monitoring system. This includes regular collection of input-output data and consumption values, the analysis of which, together with time series and key data, allows the regular monitoring of the implementation of the environmental programme. An essential element of this monitoring consists in ensuring that all legal requirements are met.

Raising awareness, information and education
A source of information available to all staff members is the environmental home page on the internet *(http://www.boku.ac.at/7058.html)*. It offers an overview of our environmental management system and contains all the most important environmental documents, the environmental guidelines and targets and a record of the environmental measures that have already been taken.

Further information is available from the numerous environmental display boards and cases. The ECPs in the departments are the main contact for staff members regarding environmental issues. New staff members are informed about the EMS during their staff induction by the EM or an ECP. In 2002, as a part of the ECOPROFIT scheme, an environmental ideas competition was held for the first time.

BOKU has been participating in the Vienna EcoBusinessPlan since 2002 and has in that time been recognised four times as an ECOPROFIT organisation.

Mag. Georg Rebernig
Umweltbundesamt (Federal Environment Agency), Vienna

www.umweltbundesamt.at/en/

Achieving sustainability together with BOKU

Universities are centres of education, research and knowledge. Their work gives them great responsibility to society and enormous scope to set an example to others.

The University of Natural Resources and Applied Life Sciences, Vienna (BOKU) has, in addition, a special responsibility to society, because sustainable approaches to the foundations of life – and the protection of these foundations – are at the centre of its education and research.

BOKU is well aware of this responsibility, as is shown by it being the first university to implement EMAS – a long-term indication of universities' readiness to integrate environmental management into their everyday activities. The environmental declaration and the environmental programme make clear two things. The first of these is the demanding measures that need to be taken to reduce direct environmental impacts. The second is the willingness to achieve sustainability across the whole university. The integration of sustainability concerns into all areas of operation in an institutional way by means of EMAS makes BOKU an important role model not just among Austrian educational and research institutions but, by means of the ripple effect through students, teachers and researchers, far beyond as well.

The interdisciplinary work carried out at a national and international level and the combination of theory with practice make BOKU into a valuable partner in the search for early recognition of problems and the finding of effective solutions on a range of environmental issues.

In autumn of 2005, BOKU and the Umweltbundesamt agreed a long-term strategic partnership. The basis for this co-operation is the commitment to sustainability at all levels and in all areas, and the focus on our environmental activities. Both partners are aware of the responsibility arising from the fact that all of their activities have a positive impact on the environment, whether this be direct or indirect and in the short-, medium- or long-term.

The aim of, and challenge facing, this partnership is to continuously derive benefit from the fruits of research, teaching and applied environmental skills, and to expand the expertise and skills of both environmental institutions.

To bring together these institutions, so different in their functions and areas of responsibility, to create synergies and allow a shared growth in knowledge provides concrete environmental benefits. This is why the “Air and Climate”, “Resources” and “Risk and Security” programmes have been started. These important environmental focuses bring together the working focuses, research intentions and consultancy activities of both institutions in order to develop an effective package of measures. BOKU and the Umweltbundesamt – a sustainable partnership for the environment.

Georg Rebernig, Umweltbundesamt

Environmental aspects

In the course of the EMAS environmental review, BOKU has carried out inspections of its activities and service provision and assessed the various aspects of our environmental impact.

Energy

Electricity consumption in 2005 amounted to 14.2 million kilowatt hours. The main consumers were the large facilities (research facilities) and the air conditioning at the Muthgasse site *(see Figure 12)*. Around 85% of the heat required for the central heating is supplied by the Fernwärme Wien distrcit heating plant utility. Around 12% of the heating energy is from natural gas. There are four locations with gas-fired boilers and two with gas-fired steam units.

BOKU produced its first energy report as early as in 1999 as a part of the “Energy efficient universities – from idea to reality” project. It was the first Austrian university to produce such a report. This was built on in the following years with the implementation of a number of improvements. Further energy savings will be made in future through the extensive renovation of historical buildings and a consumer-based energy monitoring system.

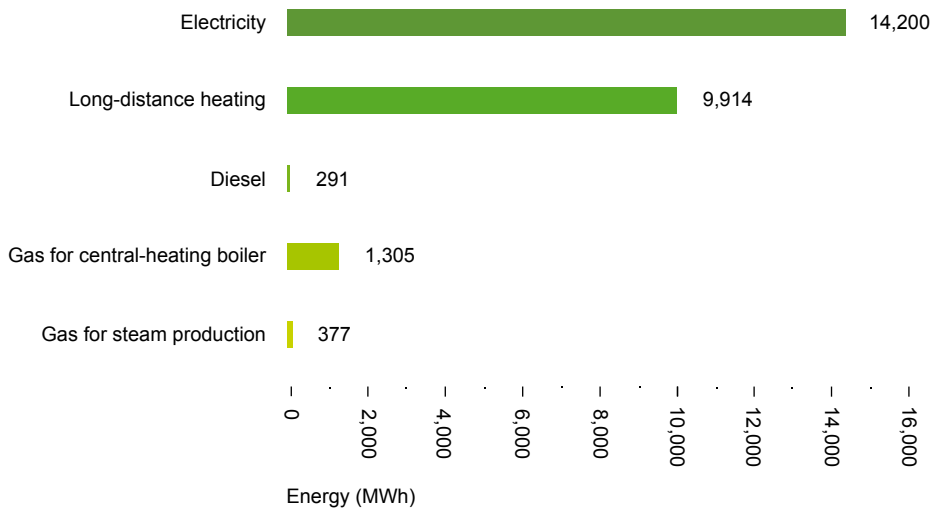


Figure 12

Total energy consumption: electricity, heat energy and diesel fuel for automobile fleet

Water

Water usage in 2005 amounted to over 91 million litres, around 34 million litres of which was from our own well. BOKU's water consumption thus equates to about 100 fully filled 25 by 10 metre swimming pools, 3 metres in depth. The major consumers of water are the bathrooms, the laboratories, watering of external areas, research experiments and air conditioning.

Material and product usage

In the case of large purchases and tendering processes, ecological criteria are already included among the bid specifications (e.g. energy consumption minimisation, reparability, spare parts guarantee). A more extensive introduction of ecological criteria into purchasing procedures is planned.

Paper. Despite extensive computerisation, the office areas continue to use large amounts of paper – around five million sheets of photocopying paper per year. Double-sided copying is to be enforced in future, as is the use of recycled paper.

Office supplies. Ecological considerations are still barely taken in account in the purchasing of ordinary office supplies. An information offensive and educational drive are planned for 2006 on the theme of ecological office purchasing.

Office furniture. BOKU takes into account ecological criteria when purchasing office furniture and has a preference for suppliers who can show that they participate in environmental activities.

Cleaning supplies. The buildings are cleaned by an external firm, which is EMAS certified. They are contracted to use environmentally sound products. It is planned that in 2006 use of plastic waste bags will be cut by 80% and waste bags made from cornstarch will be used instead.

Chemicals. All relevant staff members are regularly given information and training regarding the dosages, effects, time taken for these effects to occur, areas of application and dangers of chemicals used on human health and the environment. Safety data sheets and product descriptions are also made available to them. All chemical waste is correctly collected and disposed of.

Waste

In 2005, BOKU produced 425 tonnes of waste. Half of this (212 tonnes) was material which was recycled: paper, glass, metal, biological waste, plastics. Paper made up around a quarter of the total waste. Around 200 tonnes of the waste was residual waste, similar to household waste; the rest was hazardous waste such as solvents, laboratory and chemical waste, acids and mixed waste.

To ensure the correct disposal of waste, BOKU already has extensive facilities at many sites. Since 2002, the waste separation facilities have been progressively updated across all sites, in order to further improve the sorting of waste.

Air emissions

There are four BOKU sites with gas-fired boilers and two with gas-fired steam boilers, which produce direct emissions. All equipment is regularly inspected. These boilers account for around 8% of our carbon dioxide emissions.

Electricity and heat delivered from externl district heating and power plants cause indirect emissions to air. These include 5,385 tonnes of carbon dioxide, 9.5 tonnes of sulphur dioxide, almost 7 tonnes of nitrogen oxides and over 3 tonnes of fine particles. Additional emissions arise from the traffic caused by BOKU.

Water emissions

Our sewage consists mostly of human waste, cleaning agents and disinfectants and small quantities of laboratory chemicals (e.g. from rinsing laboratory equipment). At the Muthgasse site, laboratory waste water is pipelined to a neutralisation tank or storage tank. Laboratory waste water used for genetic technology applications is taken to be thermally disinfected.

The laboratory waste water (defined as containing a mixture of water and solvents) was analysed in 2003 at the Institute for Sanitary Engineering. It was found that it could safely be released untreated into the main sewage system as the small quantities and the substances contained represent only a low risk to the environment.

Traffic

BOKU is located in the green-belt area (18th and 19th districts) of Vienna, yet has good transportation links. Staff and students travel to the campus primarily by means of public transport. BOKU has since 2005 its own fleet of 17 vehicles, of which seven were newly acquired in 2005. The vehicles are made use of by all departments at the Türkenschanze and Muthgasse sites in common, in order to maximise the usage of the vehicles and avoid unnecessary vehicle purchases. In 2006 these vehicles were fitted with diesel particle filters.

Construction and renovation work

BOKU rents all of its properties from the government property agency (BIG). This latter is, as owner, responsible for all construction and renovation work. As user, we seek to introduce ecological concerns as far as possible. In recent years many buildings have been successively renovated. This has considerably improved their energy efficiency. The renovation of the main buildings is planned for the coming years.

Environmental indicators

The measurement of our environmental performance is based on environmental indicators *(see Table 35)* provided by out input-output analysis. This allows us to regularly measure the improvements in our environmental performance and to identify potential for further improvements. Comparisons with other universities are helpful but difficult to make, as the data does not always show which equipment and processes are in operation or have been taken into account in the compilation of data. Overall, only a few universities (mostly in Germany) compile useable environmental indicators.

Table 35

Environmental indicators BOKU absolute/comparative

		2005				
	Data quality	absolute	relative	benchmark		
Staff	very good	1,365 MA				
Students	very good	4,453 Sd				
Main floor space	very good	99,362 m²				
Energy						
Electricity consumption[1]	intermediate	14,200 MWh	10.4 MWh/MA	< 4	6	> 8
			142.9 kWh/m²	< 60	80	> 120
Heat consumption	intermediate	11,219 MWh	8.2 MWh/MA			
			113 kWh/m²	< 110	130	> 150
Water						
Water consumption[2]	very good	57,431 m³	168.3 l/MA/d	< 60	100	> 120
Material and product usage						
Total paper consumption		n. q. kg	n. q. kg/MA	< 100	200	> 500
Writing/copy paper consumption	intermediate	5,000,000 A4 format	3,663 sheet/MA	< 5,000	7,000	> 10,000
Percentage of recycled paper			< 5 %	> 30 %	20 %	< 10 %
Waste						
Total waste (excluding biological waste)[3]	good	347,380 kg	255 kg/MA	< 220	270	> 350
Waste paper (including paper board)	good	105,465 kg	77 kg/MA	< 120	160	> 190
Percentage of recycling (recycled waste)[4]			5 %	> 60	55	< 50
Traffic						
Business trips		n. q. km	n. q. km/MA	< 1,700	3,000	> 6,000
Rail kilometer percentage of business trips			n. q. %		no data available	
CO_2 emissions (total)						
CO_2 emissions (operation, fleet excluding business trips)[5]	intermediate	5,879 t	4.3 t/MA	< 2.8	4	> 4.5

Comments:

1/2 The high electricity and water consumption is caused by the research facilities at Muthgasse.

3 Waste was calculated as the total amount of waste minus biological waste that is directly composted on site.

4 Percentage of recycling is calculated based on the amount of potential recyclables.

5 CO_2 emissions as a result of energy consumption and the operation of the automobile fleet, business trips are excluded.

Data quality:

very good = precisely obtained data for electricity, heat energy (natural gas, long-distance heating), fuel consumption, copy paper and hazarduous waste and waste oil

good = verifyable data, data partially projected for waste based on container volumes

intermediate = data partially estimated for paper consumption of departments.

benchmark: green = best practice, orange = verage within the sector, red = above average of the sector. Comparative data were obtained from other universities and service providers such as banks.

n. q.: not quantified

Environmental measures implemented

In recent years BOKU has implemented numerous environment-related measures, above all as a result of its participation for the first time in the ECOPROFIT scheme in 2001. Especially the design of a unitary waste separation system and the implementation of energy and water saving measures should be noted. This has not only led to ecological benefits but also to financial savings. In 2005/6, the outstanding activity was the implementation of an environmental management system in accordance with EMAS and ISO 14001, the first of its kind at an Austrian university, and its successful certification.

Energy

- Gregor Mendel building: installation of 240 thermostatic valves cutting energy consumption by 20,000 kWh.
- Schwackhöfer building: controlled night-time ventilation, cutting energy consumption of the air conditioning system
- Schwackhöfer building: installation of up-to-date lighting systems and technologies.

Water

- Updating of the sanitary facilities in the Cieslar building, saving around 22,000 litres of water per annum.
- Installation of eight waterless urinals, saving around 125,000 litres of water per annum.

Material and product consumption

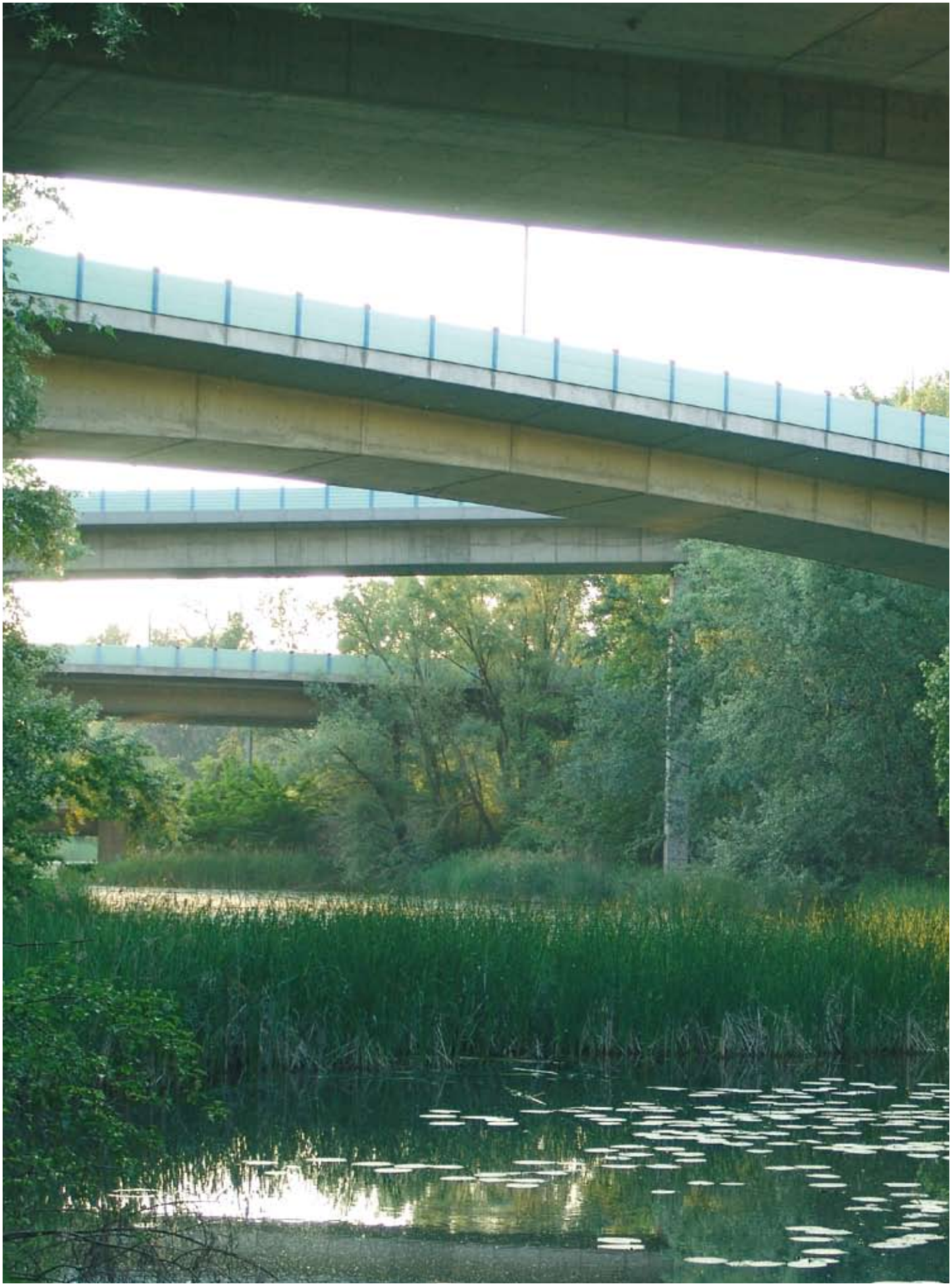
- Acquisition of the latest type of metal cupboards for the storage of laboratory gasses.
- Acquisition of storage tubs.

Waste

- Carrying out of waste analysis at the Muthgasse 1 & 2 sites.
- Guttenberg building: New waste separation systems in both public and institutional areas. New separation system operated. New guidance offered (colours, pictograms, pho tos), reducing considerably the amount of unsorted waste.
- Expansion of the new waste separation system to the Schwackhöfer and Cieslar buildings.

Building and construction work

- Extensive renovation of the Tüwi building: insulation of roof and walls with 8 cm mineral wool and installation of double glazing leading to a reduction in heat consumption of around 3,000 kWh
- Renovation of the Guttenberg building: Installation of double glazing with k value of 1.4, allowing heating energy costs to be cut by around 90,000 kWh. Roof insulation at k = 0.23 (previously k = 1.2), saving a further 55,000 kWh.
- Renovation of Cieslar house: roof renovation, inter-floor insulation and roof insulation over a lecture hall in the basement (new k value of 0.23,) cutting heat consumption by around 36,000 kWh.



Prof. Dr. Helga Kromp-Kolb

www.wau.boku.ac.at/met.html?&L=1

Helga Kromp-Kolb

I have learnt to take a critical approach to things that appear to be self-evident and to take a close look at apparently absurd combinations before rejecting them.

My research interests have always addressed issues of societal and political concern, without this being my conscious intention. I became involved in the question of atmospheric pollution immediately after completing my studies, because my supervisor and the head of my institute was Prof. Heinz Reuter, who was involved in the approval processes for various power stations, such as those at Voitsberg, Mellach and Dümrohr, in an advisory capacity. He asked me to produce computer models, which were fairly new at that time. Dealing with the destruction of forests and depletion of the ozone layer was a natural development. The on-going discussions with businesses and officials, and above all with other advisors and NGOs, often provided a stimulus to asking more or deeper meteorological questions, as well as to interdisciplinary approaches and consideration of social and economic aspects. I have learnt to take a critical approach to things that appear to be self-evident and to take a close look at apparently absurd combinations before rejecting them. I have also learnt to always take a step back and look at problems from a higher perspective – insoluble dilemmas can then often be seen to be questions being asked in the wrong way. The concept of sustainability, formulated by the Bruntlandt commission in 1987, has matured in my thoughts over the years and is now a permanent part of my world view.

Sustainability is of particular relevance to climate change. The time delay between human action and the effects of this being visible in nature is so great that taking future generations into account is essential. Consideration of climate change can also provide other essential insights, such as that our greenhouse gas emissions, here in Austria, have a global impact, even when this can not be individually identified or quantified. This also means, of course, that measures which we take to protect the environment are of global relevance and that the measures taken by each individual make a contribution, however small, to the solution of one of the greatest problems of today and tomorrow.

Because it is human nature to pay more attention to deeds than words, it is vital that BOKU, as an educational institution for leaders of the future, sets a good example of sustainability. It is the small things which we can do every day – regional produce, organic food, recycled paper, waste separation, careful use of resources – which constantly remind us of what we should do and which can eventually become normal. It is the larger things,

such as the construction of new carbon-neutral buildings in a resource-minimising way, which can show to ourselves and to the outside world that more can be done and that energy and emission savings can go together with higher levels of user comfort and aesthetics.

The drive for sustainability in our own area is a task which means that students, teachers and administrators all need to learn. This experience can be an important one for all members of the university.

BOKU must, however, do more than put sustainability into practice. It must devote itself to research into this topic. I am convinced that we must work more intensively than we have to date on the issue of global change, which is at present anything but sustainable in the Bruntlandt sense, in order to be better prepared for the decisive changes to come. Climate change is probably the aspect of these changes which has found the greatest official acceptance and it is of deep concern, both in terms of the changes to date and, even more so, the future scenarios. The excessive emissions of carbon dioxide and other greenhouse gases by humans have over the past hundred years made a major contribution to the temperature rise of around 0.6 °C. In Alpine zones, a temperature rise of 1.6 to 2°C was recorded over this period, and in Alaska a rise of over 4°C. Other aspects of climate have also undergone measurable changes, such as in volumes and intensities of precipitation, cloud cover, wind speeds and the amount of snow cover. By 2100 a temperature increase of 1.4 to 5.8°C globally is to be expected, whilst in Alpine areas we should expect an increase of 4°C in the next fifty years. The number of days with temperatures above 30°C could double in regions up to 1,500m above sea level in Austria in this period. Although individual extreme weather phenomena, leading to floods, landslides and avalanches, can never be attributed with certainty to global warming, the global increase in such phenomena is in keeping with the climatic changes.

Climate change will impact upon all areas of life, the economy and the ecosystem. How badly damaged these systems are will depend on their sensitivity to the changes and their ability to adapt. The strengthening and raising of the dykes in the Netherlands against the rise in sea level (of around a metre by 2100) is an example of the ability of a sensitive system to adapt. The situation is different in the low lying, heavily populated areas of the Nile delta in Egypt and the Ganges delta in Bangladesh. Here, the option of building dams is neither technically nor economically feasible. This means that many millions of people will need to leave these areas, a far greater population migration than any that has occurred to date. Similar examples can be found in the spheres of agriculture and water supply, above all in regions where the struggle for life is already extremely hard. Diverse studies have all come to the same conclusion – climatic changes will increase the gap between rich and poor. If policies to achieve global redistribution are not energetically pursued, this will lead to increases in social tension, terrorism and war.

Other changes are taking place on a global scale in parallel to these climate changes. Increasing scarcity of resources, in particular the end of cheap oil, is among the most important.

Many experts are of the opinion that the maximum volumes of oil which can be extracted have already been obtained or will soon be reached. With a rising global population and increasing per capita energy consumption, this will mean increasing scarcity. It is highly questionable whether renewable energy sources will be able to fill the gap. Non-renewable or hazardous technologies, or those whose effects are not yet fully understood, such as atomic power or the artificial capture of carbon dioxide in the ocean (sequestering), should be avoided. We will need to put a much greater emphasis on energy efficiency and energy saving; the question will not be how we can replace the fossil fuels but rather how we can live with less energy. Similar developments will be seen with other resources. This means that we need primarily to change the way we think about these issues and move from growth to sustainability.

The view of the future sketched here may appear too pessimistic to many. People have faith that our problems will be solved by new reserves, new technologies or "the market". Maybe they're right. But a university's job is to replace faith with scientific analysis. Various disciplines are starting to look at the complex effects of climate change. When it comes to other aspects of global change, we have come much less far. But it is necessary to know the problem before it can be solved. The focus on global change which BOKU is developing at Türkenschanze, combining the available expertise from numerous disciplines, is aimed at making a contribution to finding a scientific solution to these problems. Graduates should be prepared for the upheavals to come and be in a position to make an active contribution to shaping the future. I am looking forward to taking part in such socially relevant and exciting work!

Ideas with substance – societal and economic development outcomes and impact

Output and impact of core processes: Education and continued education

After the introduction of tuition fees in 2001, there was a short-term rise in the numbers graduating, which have since then remained stable or risen only slightly *(see Table 36 or for more details Table 37, in appendix)*. This can be traced back to the rapid graduation of a number of long-term students together with a simultaneous major fall in the total number of students.

It is to be expected that the sharp rise in student numbers, which has been observed above all among those studying for a bachelor's degree since its introduction, will first be reflected in the graduation figures in 2006 at the earliest, when the first full year groups of bachelor's students complete their courses.

The figures show that around a fifth of those graduating from BOKU have spent time studying abroad (*see Table 38*). As is the case with the mobility statistics in general, there is here too a trend towards semesters abroad being spent within the EU – presumably at least partly due to structured and well-organised exchange programmes such as SOCRATES-ERASMUS. Of the 68 people graduating having spent time abroad in the EU, 33 were female and 35 male. A further 40 graduates spent time in non-EU countries – 16 females and 24 males *(see Table 38)*.

BOKU's aim is to see these mobility figures rise further. This should allow our graduates to gain better foreign language skills and more experience of foreign countries – both of these being key to their future careers.

It should be noted with regards to graduates' participation in the continuing education opportunities which the university offers that these opportunities are at present focussed on passing on the knowledge and skills in which BOKU specialises to people outside of the university. Special training opportunities for BOKU graduates are currently being developed.

Of the 503 people graduating from BOKU in the academic year 2004/5, 123 completed their studies within the intended time *(see Table 39, in appendix)*. This amounts to 24.5% of all those graduating. It is also the case that only around a quarter of those completing doctorates (26 out of 99) were able to do so within the standard period, which is due to the special demands of research (laboratory work) for a doctorate in the field of natural resources and applied life sciences.

In comparison to the academic year 2003/4 *(see Table 40, in appendix)*, the numbers graduating within the intended period were significantly higher, although more needs to be done in this area. Improvements to the situation regarding the space and supervision available for the numerous supervision-intensive teaching sessions at BOKU, which are essential to the quality of the education, the proportion of those completing their first degrees within the standard period could be increased.

Neither the last year group studying for diplomas nor the first group of those studying for bachelor's degrees have yet completed their studies. Those starting to study for master's degrees have thus far come mostly from abroad. In the years in which the changes were taking place, there were a relatively high number of students voluntarily submitting to curricula which conformed to the Bologna regulations. This trend will only change when the first year group of those studying for bachelor's degrees is ready to move on to master's studies.

A reliable picture of the time being taken for students' courses and thus the number of people graduating within the standard period will only be available once the three-stage study system has been consolidated.

Table 36

Number of degrees awarded in 2003/04 and 2004/05 (IV.1.1)

Curriculum[1]	Type of degree	2005 Nationality				2004 Nationality			
		Austria	EU	Third countries	Total	Austria	EU	Third countries	Total
4 NATURAL SCIENCES	First degree								
	Further degree								
	Total								
5 ENGINEERING, METALLURGY CIVIL ENGINEERING	First degree	156	3	1	160	149	6	2	157
	Further degree	44	6	10	60	46	1	6	53
	Total	200	9	11	220	195	7	8	210
52 Engineering and technical professions	First degree								
	Further Degree								
	Total								
54 Metallurgy and mining	First degree	81	1	1	83	58	1	2	61
	Further Degree	31	5	7	43	33	–	2	35
	Total	112	6	8	126	91	1	4	96
58 Architecture and civil engineering	First degree	75	2	–	77	91	5	–	96
	Further Degree	13	1	3	17	13	1	4	18
	Total	88	3	3	94	104	6	4	114
6 AGRICULTURAL SCIENCES	First degree	169	18	3	190	170	23	3	196
	Further Degree	25	2	19	46	30	7	11	48
	Total	194	20	22	236	200	30	14	244
62 Agriculture, forestry and fisheries and allied sciences	First degree	169	18	3	190	170	23	3	196
	Further Degree	25	2	19	46	30	7	11	48
	Total	194	20	22	236	200	30	14	244
8 SERVICES	First degree								
	Further Degree	2			2				
	Total	2			2				
85 ENVIRONMENT	First degree								
	Further Degree	2			2				
	Total	2			2				
86 Safety services	First degree								
	Further Degree								
	Total								
9 Not known/ no specific data available	First degree	7			7	12			12
	Further Degree								
	Total	7			7	12			12
99 Not known/ no specific data available	First degree	7			7	12			12
	Further Degree								
	Total	7			7	12			12

	Type of degree	2005				2004			
Total	First degree	332	21	4	357	331	29	5	365
	including diploma degrees	318	21	3	342	328	29	5	362
	including bachelor's degrees	14	–	1	15	3	–	–	3
	Professional degrees	71	8	29	108	76	8	17	101
	including master degrees	5	–	6	11	1	–	6	7
	including doctorate degrees	66	8	23	97	75	8	11	94
	Total	403	29	33	465	407	37	22	466
	including diploma degrees	318	21	3	342	328	29	5	362
	including bachelor's degrees	14	–	1	15	3	–	–	3
	including master degrees	5	–	6	11	1	–	6	7
	including doctorate degrees	66	8	23	97	75	8	11	94

1 On level 1–2 of the ISCED classification

It should be noted that these figures may be distorted by the fact that the numbers graduating within the intended period are not recorded directly but rather by means of a formula which is based on the numbers starting their studies a certain period before. This may, due to the changes of previous years, lead to inaccurate figures being obtained.

In 2005, those being awarded doctorates made up around 20% of all graduations *(see Tables 41 and 41a, both in appendix)*. This shows the degree to which BOKU is contributing to the education of the next generation of scientists. The reforms of the doctorate curricula and the development of PhD curricula will allow this proportion to increase further.

Table 38

Number of degrees awarded with funded temporary stays abroad during study for the academic years of 2004/05

Host country of temporary stay abroad	Females	Males	Total
EU	33	35	68
Third countries	16	24	40
Total	49	59	108

Output and impact of core processes: Research and development

Publications

Scientific publication is an extremely important indicator of scientific activity and recognition. Publications are an essential indicator of quality within the careers of researchers. They are on the one hand essential to these careers (e.g. for habilitation and appointment to chairs) and on the other hand are used as a qualitative indicator in the project acquisition process, in particular when funding is distributed by competitive means i.e. by means of project evaluation. Scientific quality is usually assessed by means of the number of publications in peer-reviewed journals – those indexed in Science Citation Index Expanded or in Social Science Citation Index. An excellent publication record is a precondition for long-term success in project funding acquisition. Despite the well known problems surrounding the taking of publication statistics as performance indicators, and the fact that BOKU departments are highly divergent and some have only a very limited number of peer-reviewed journals available in their disciplines, publications are nonetheless used internally as a performance indicator within BOKU. Publication categories, such as the number of contributions to SCI-listed journals or joint works and published contributions to scientific events, are included in the target agreements reached between the Rectorate and departments, to name just one example.

What BOKU researchers publish in scientific journals and collected editions is not just the results of theoretical research; most of what they publish arises from application-orientated research. As BOKU, in accordance with its knowledge goals, pursues the goal of providing solutions and strategies for economic, management and political applications, BOKU researchers are encouraged to contribute to this by means of publishing in applied and practice-orientated journals.

Table 42

Number of scientific publications of the staff in 2005 (IV.2.2)

Type of publication	2005	2004
Articles published for the first time in SCI journals (source: SCI exp./SSCI: articles in listed journals)[1]	288	273
Articles published for the first time in other scientific journals	324	270
Articles published for the first time in collected editions	121	86
Articles published for scientific congresses (proceedings)	900	597
Other scientific publications	324	314

Type of publication	2005	2004
Monographs	20	14
Research reports and expert reviews	266	205
Editorialships	22	18

Articles published for the first time in SCI journals (source: SCI expanded/SSCI:articles according to Journal Citation Report)

Dietmar Pum

Dietmar Pum, born in Lower Austria, was always fascinated by mathematics. But because everyone said there was no way to make a living as a mathematician, he studied applied physics in Vienna instead. That was no bad move as it led to his chance meeting with Uwe Sleytr. Sleytr was offering an interdisciplinary doctoral post at the Technical University, Vienna and Pum, who had specialised in electron microscopy, was immediately interested. Pum's work at BOKU began in 1981, working to "make structures visible". He went on to spend time researching at the ETH Zurich and the University of Stockholm. The variety and aesthetics of the living world, where order exists amongst the variety, always give him new enthusiasm. "I have always seen things in a structured and abstract way", he says. "That's the way I think. That also comes in handy when it comes to organisation and sharing out work".

Pum brought with him the technical skills needed to make visible the structures that Sleytr and his team were working with. "In order to establish the interface", as he puts it, Pum needed to learn the language of microbiology, whilst the microbiologists in turn had to learn the language of physics. All the descriptions of Pum's area of work have to do with "making visible": transmission electron microscopy, electron force microscopy, digital image manipulation, biosensors, manufacture and characterisation of metallic nanoparticles, Langmuir-Blodgett techniques, biomimetic membranes and others. An EU project dealing with the development of a molecular electronic storage device for Sony took Pums back to the world of physics. Another new project, for the US Air Force, concerns the manufacture of new types of silicon structures. "This is pure research and has nothing to do with military applications", says Pum. "We are looking at the structures of diatoms and using the natural processes of self-assembly to manufacture highly ordered nanoarchitectures. These structures should be able to produce crystalline protein lattices which we use to make the nano-scale glass structures needed for specific optical applications".

At the moment Pum, who is a winner of a Philip Morris prize, has a group of five researchers. Pum, who is Uwe Sleytr's deputy, would like to see less administration and more laboratory space. His hobbies are skiing, sailing, tennis and reading. He has also shown a talent for graphic design, exemplified by his attractive nanobiotechnology posters. And he is pleased to be able to say that "my nine year old daughter has clearly inherited this talent".

A comparison of the publication statistics for the calendar years 2005 and 2004 shows that there has been a considerable rise in the number of contributions to scientific journals and in involvement in conferences of BOKU researchers since 2004 *(see Table 42)*.

A comparison of the number of publications with the number of habilitated (full-time) staff (professors and lecturers) on the October 15, 2005 (equivalent to full-time positions) shows that in the calendar year 2005 an average of 3.4 articles were published in professional journals and 1.6 in refereed journals, i.e. those listed in SCI Expanded or SSCI. An average of 5 contributions to academic conferences were therefore published per habilitated staff member. A comparison of these figures with those from 2004 suggests that the increase is in part due to the fact that 2005 saw the completion of the implementation of major parts of the Universities Act 2002 (the systems evaluation for

the whole university was carried out in 2004), and in part due to the increased numbers of third-party funded projects, for example those at an EU level, which leads to more involvement in conferences.

It can further be noted regarding 2005 that Prof. Katinger of the Institute of Applied Microbiology (IAM) and his colleagues were among Science Citation Index's "most cited" in the field of virology. His colleague Dr. Gabriela Stiegler was the most cited German speaking virologist of 2005. Prof. Katinger was also the most cited in the field of virology according to a comparison of 2000-02 citations carried out by Laborjournal online (see Laborjournal online, 03/2005).

This success comes as no surprise given that the IAM, although it has not been named a virology competence centre, is pursuing an exceptional applied virology strategy which is arousing great interest within the life sciences community in this highly skilled area.

Prof. Hermann Bürstmayr has seen his article "Molecular Mapping of QTLS for Fusarium Head Blight Resistance in Spring Wheat. I. Resistance to Fungal Spread (Type II Resistance)" named by Thomson-ISI as a "highly cited paper". That means that it is among the 1% of most cited articles in its field (plant and animal sciences).

BOKU is of course also involved in the transfer of knowledge to interested citizens and practitioners, for example through popular scientific contributions to radio, TV and print media and through podium discussions and lectures (see next chapter).

A considerable portion of BOKU's research projects are financed by the European Commission and by Austrian regional authorities. Its applied focus has allowed BOKU to carry out numerous projects in co-operation with or on behalf of Austrian and international industry and business.

Proceeds from research and development projects

BOKU and its academic staff have by these means managed to achieve, in addition to its global budget (funding allocated by central government) of approx. € 72.6 million, a relatively large annual third-party funding budget. Around a third of the global budget has been raised as additional third-party funding *(see Table 43).* This is thus a significant contribution to securing Austria's status as a centre of research and economic activity.

In the calendar year 2005, a total of over € 25 million was received by BOKU researchers for current projects. It is noteworthy that the income from European Commission funded projects has fallen slightly. The level of EU funding as a proportion of the total income fell from 23.95% (2004) to 22.8% (2005). There was, however, a rise in the level of funding from other sources (central government, industry etc.).

It should be noted with regards to income from EU contracts that in 2005 approx. € 1.7 million was administered by BOKU in its capacity as a coordinator of EU projects and passed on to partners, located overwhelmingly abroad. This was around € 200,000 more than in the previous year.

A reason for the slight fall in levels of EU funding could be that the majority of the projects acquired under the 5th EU Framework programme are, as a result of the long negotiation periods, only now beginning. The large number of successful applications in the 6th Framework Programme which had been already achieved by the programme's mid-point (see intellectual capital report 2004) suggests however that EU income is set to rise in the years to come.

Table 43

Proceeds from R&D projects according to subsection 27 (1) 3 of the University Act 2002 in euro (IV.2.5)

Commissioning/funding organisation	Proceeds in m EURO (2005)	Proceeds in m EURO (2004)
EU	4.12	4.74
Other sponsors	17.32	16.02
Total	21.44	20.76

Proceeds from R&D projects according to subsection 26 (1) 3 of the University Act 2002 in euro (IV.2.5)

Commissioning/funding organisation	Proceeds in m EURO (2005)	Proceeds in m EURO (2004)
FWF	4.24	3.73

Also noteworthy is the rise in FWF (Austrian Science Fund) proceeds in comparison to the figure contained within the intellectual capital report 2004 of € 0.47 million. It is to be noted here that no exact data exist for “old” projects, acquired before the implementation of the 2002 Universities Act, running in 2004. A inquiry to KPMG, who were responsible for the administration of FWF project funding on behalf of BOKU research staff before and after the implementation of the Act, resulted in the answer that no definitive assignment of “old” projects to individual universities is possible.

Katja Sterflinger

They are everywhere. We have no idea how many of them there are. They can survive almost anything, and Katja Sterflinger is on their trail. What are they? Microfungi. 7,000 genera of fungi and yeast are sitting in tubes with nutrient solution, frozen at subzero temperatures and stored in three large freezers at the Muthgasse site. Researchers come from all over the world to make use of these collections and also order fungi via the ACBR's (Austrian Center of Biological Resources and Applied Mycology) online database.

Fungi can live not just on organic material but also corrode metal and glass. They are able to break down hydrocarbons, for example from exhaust gasses, and they love aromatic substances. Strange fact – monuments near to bakeries and fast-food outlets are especially at risk. This is where the fungi particularly thrive as a result of the organic emissions and attack the stone with extra vigour.

Katja Sterflinger, who was born in Aachen and researching in the exotic field of geomicrobiology, is fascinated by the fact that such small organisms can have such a big effect. Her doctorate on the destruction of antique marble by fungi put her right at the interface between science and art history. The grey marble at Delos was made grey not by air pollution but by the tiny, black, round fungi which give out acid and bore into the stone, destroying its structure. In this way fungi can create pressure as great as that of a car tyre and their destructive work is very fast. In 130 years they can remove a centimetre of marble, so that inscriptions are no longer legible. It would be better, says Sterflinger, not to take some artefacts out of the ground at all, as they would be better preserved if they remained buried. The fight against fungi is also of great economic importance. Sterflinger and her team work on numerous large projects. Museums and historical organisations are good customers. The team is are working in the vaults of Vienna's Albertina museum to install a monitoring system to prevent damage and are also working with Vienna's "Kunsthistorisches Museum" and the Essl Collection. The Michaelerkirche crypts and the Roman wooden roof of a Swiss church are other unusual places where the team works. It is surprising to learn that their skills are also in demand from the VOEST steel company, where fungi in the cooling lubricants cause great problems for the whole system of production.

Fungi thus represent a potentially unlimited area of research, and Sterflinger would be pleased to be able to carry out more research into their biodiversity. She has one other hope – "I hope BOKU preserves its diversity and manages, despite all the performance agreements, to maintain some part of the Humboldtian ideal. We need above all freedom of thought and action – what we don't need is the so-called 'elite university' that some are trying to create."

Analysis carried out by the statistics division of the FWF on behalf of the Ministry of Education, Science and Culture (data collation for formula budget) shows that in the calendar year 2005 a total of just over € 4 million was given by the FWF to BOKU researchers to fund "old" (pre-Universities Act 2002) and "new" (post-Universities Act 2002) projects, around half a million euros more than in 2004. According to the FWF, it should be noted that the sums reported by the FWF to the Ministry of Education, Science and Culture do not include funds which are, according to the project documentation, reserved for external project partners. This means that the funding paid to such external partners is not included in the amounts recorded. Deviations from this, such as those due to a BOKU institute passing on more funds than stated in the project documentation, cannot at present be accounted for.

Prizes and awards

BOKU researchers won a total of ten prizes and awards last year in recognition of outstanding research. This included five women and four men. It is worth noting that the majority of prizes were won by young researchers (classed as those under 35 on January 1, 2006) – four of the women and three of the men fell into this category.

The following prizes were won by BOKU researchers in 2005:

- AGRANA Research Sponsorship Prize
- Theodor Körner Foundation Sponsorship Prize
- Prize for Outstanding Work, Road and Traffic Research Society
- Josef Schöffel Sponsorship Prize of the State of Lower Austria for Outstanding Services to the Protection of Local Nature
- Sponsorship Prize of the Austrian Entomological Society
- H. Wilhelm Schaumann Prize
- Zellcheming Next Generation Prize (Society of Cellulose and Paper Chemists and Engineers)
- Thurn und Taxis Sponsorship Prize in Forestry Science
- Chamber of Commerce Prize, Vienna Chamber of Commerce

Output and impact of core processes: Societal and economic development

Exploitation of results of research

Patents are a key indicator of BOKU's research and innovation expertise. The research support office's ongoing advisory work has managed to raise the number of innovations being registered from seven in 2004 to eleven in 2005. The large number of advice sessions and inquiries concerning new inventions are certain to lead to even sharper increases in future. Most probably here have been a number of inventions to which the rights are held by partners and which were not reported to the Rectorate. The extensive advice, given in particular to first-time inventors, has ensured that to date more than 70% of new innovations reported to the rectorate have resulted in patent applications. Three of the eleven reported inventions resulted in patent applications by BOKU and five resulted in patent applications by our partners from industry.

There has been as yet no patent granted for applications made in the name of the University in 2005 *(see Table 44);* the length of patent proceedings means that this is not to be expected before 2006 at the earliest. The six patents listed as being granted in the intellectual capital report 2004 were not obtained by BOKU itself, as the now applicable Intellectual Capital Report Act from the Ministry require, but rather by BOKU researchers. As a result the 2004 figure should be corrected to 0 in view of the definition given of indicator IV.2.4 in the Act.

The research support office's work in the areas of technology transfer and exploitation enabled awareness of the economic importance of scientific knowledge to be increased even in traditionally less application-orientated fields. It has already been shown that innovations developed and exploited in co-operation with businesses provide a much better long-term basis for co-operation. The good experiences had in this field will make the future acquisition of new partners from industry easier and thus improve the linkages between science and the economy further.

Communicating with society

BOKU researchers perform essential tasks for society, such as through the support provided to the Austrian central government, local government and national and regional authorities. Other essential services provided include consultancy and advice on issues of national or European relevance, such as those concerning sustainable development (in the countryside), nature and environmental protection, protection from natural disasters (floods, avalanches) etc.

Communicating with society and the public is something taken very seriously by BOKU. This covers providing information about specific processes of concern within the university itself, as well as the communication of the results of our research and associated information to the wider world.

BOKU informs Austrian citizens about its research activities and in particular the results arrived at. The BOKU's researchers of course meet their obligations to the taxpayer, interested members of the public and the worlds of politics and the economy, for example by taking part in day-to-day political events, sharing their expertise by means of radio and television appearances, contributing to popular and specialist publications and being available to take part in symposia, conferences and workshops. In these ways BOKU researchers contribute to controversial debates such as those concerning the effects of climate change and natural disasters, healthy nutrition, traditional agriculture versus organic farming etc.

In 2005, BOKU scientists made at least 87 contributions to popular scientific publications, rather fewer than in 2004 (*see Table 45*). There was, however, an increase in the number of non-

published presentations given. Whilst in 2004 at least 655 non-published presentations were given, in 2005 BOKU researchers made at least 800 contributions to symposia, conferences and workshops.

The PR and press office was involved in 2005 in the preparation and press management of numerous workshops, symposia and other events. Numerous pieces were prepared for publications published by BOKU and others. In 2005, 63 press releases were sent out (by post and/or email). In 2004, four press conferences were organised and 52 press releases sent out.

Table 44
Overview of innovation reports and Intellectual Property Right (IPR)-applications in 2005 and 2004

Overview of innovation reports and Intellectual Property Right (IPR)-applications	2005	2004
Innovation reports	11	7
Inventions claimed by BOKU	8	5
Patent applications filed by BOKU	3	3
Patent granted to BOKU	–	0[1]
Third-party rights	5	4

1 The six patents published in the intellectual capital report 2004 do not refer to BOKU as such, as stated by the Intellectual Capital Report Act, but rather to BOKU researchers.

Other PR measures taken included, in addition to the press management of inaugural and valedictory addresses:

- the organisation and holding of the “Academic Spin-offs” press conference, as well as helping to organise a press conference to present the intellectual capital report 2004 in Alpbach.
- press management of Dr. Franz Fischler’s series of lectures
- press management of the “Lange Nacht der Forschung” research presentation evening and “Study Info Day 2005”.
- press management of the nine-part “How to Eat to Live” lecture series (held by Institute of Organic Agriculture).

BOKU took an active part in measures taken to promote the public understanding of science, such as the “Everyday questions – scientific answers”, “University meets public” and the “Lange Nacht der Forschung” research open evening events. In the course of the “University meets public” series of events, BOKU researchers informed Viennese citizens about the issues which continue to confront society in various forms.

Table 45
Output and impact of core processes: Societal and economic development

A list of indicators	2005	2004
Articles in popular scientific media	87	100
Unpublished presentations	> 800	655
Number of citations according to APA	724	758
Number of press conferences organised	–	4
Number of press releases	63	52

Hans-Peter Nachtnebel

Even after many years of research Hans-Peter Nachtnebel continues to be fascinated by the way in which "one again and again comes up against the limits of the possible. The major findings of recent years in particular have shown that one can't work against nature but only with it." One of the focuses of Nachtnebel's work is the analysis of the water cycle and the technological possibilities which exist to make use of it in various ways. It is a field full of controversies, such as those surrounding flood protection and planning, water resources and land use, hydroelectric power and flood plain ecology. There is plenty of work for the Institute of Water Management, Hydrology and Water Engineering and its thirty members of staff.

Nachtnebel sees his duty as being to explain to the public that protection from extreme events is only possible up to a certain point. "It is a learning process for scientists, for the authorities and for those affected. Society needs to ask questions which also involve politics and money. Planners must explain their projects to those affected and scientists must analyse individual projects from an overall point of view." This can certainly lead to conflict. Nachtnebel sees a need for persistent researchers who can use their abilities to deal with difficult consequences. In order to maintain such critical potential and its neutrality, as far as possible, the "university needs to keep its distance from politicians".

In the future, the damage done by extreme events is set to rise: "We are at increasing risk because we are getting richer and the value of the damage done is going up. We need to take better action in terms of planning in danger areas and to develop better predictive and information systems." A positive example pointed to by Nachtnebel is Japan: "We could learn a lot from their approach to information and civil protection".

Hydroelectric power continues to be seen negatively by the public in terms of its environmental impact. "BOKU can do a lot here to explain clearly the impact that this technology has on the environment and to explain its advantages." In Austria, two-thirds of the electricity is produced by means of hydroelectric power. Of course this impacts upon the landscape and conflicts between hydroelectric power and conservation are unavoidable; there is scope for BOKU to intervene more strongly here.

The "Everyday questions – scientific answers" lecture series was developed and implemented by the PR and Press Office in co-operation with the Vienna City Library. In 2005, the following themes were addressed:

- Plants, not concrete – how can we work with living building materials?
- Planning safe open spaces in Vienna
- Just for pleasure – gardening and plants
- A load of rubbish – what really happens to Vienna's waste
- Traffic in Vienna – a look to the future
- Are foods becoming medicines?
- What happened to summer 2005?
- Development co-operation – the example of West Africa
- Intelligent construction – saving resources

In 2005, BOKU participated for the first time in the "Lange Nacht der Forschung" research open evening, with events held at the Türkenschanze and Muthgasse sites. The university management's support for such events is shown by their having contributed funds in excess of those provided by the organisers, as well as covering themselves costs which had initially been promised by the organisers. Several BOKU departments took part in the first "Lange Nacht der Forschung" open evening and

There are now a number of technological ways, such as bypass channels, to minimise the effects of hydroelectric power. “The extension of hydroelectric power is in itself sensible, but there has been a shift in societal values since [the effective campaign to prevention construction of a hydroelectric plant at] Hainburg. For the first time, the public is not prepared to accept any old policies – which were, by the way, highly one-dimensional and imposed from above – but rather insists on being consulted. And this is good. We need, in general, low-risk strategies which enjoy wide societal support and are, if necessary, reversible.”

Nachtnebel, who recently received an honorary doctorate from the Agricultural University of Warsaw, travels all over the world. One destination was the Aral Sea, of which the western part can no longer be saved because so much water has been taken for agricultural purposes and inefficiently used. He has been involved in knowledge transfer to and co-operation with Poland, Russia, Uzbekistan, Kyrgyzstan, Morocco, Jordan and Syria. He is working at present on developing a doctorate programme for water and the environment in Central Asia and the Middle East. He does not like talk of “war for water” – UNESCO study has shown that over the course of history, water has almost always given rise to co-operation rather than conflict. “Rivers are trading routes which bring people together rather than pulling them apart.” Nachtnebel’s favourite river in Austria is the Erlauf.

He was most impressed by the Mekong and the Ganges as the spiritual arteries of their countries. “What I value about BOKU is that one can work in a truly interdisciplinary and international way”, he says. That is certainly true of him. The list of his memberships of international committees and the most important of his recent projects alone would fill a full page.

developed and set up the following events for the public:

- Are natural disasters fate? Modern ways to tame the dragon
- Safe environment, safe food
- Enjoy food safely
- Mycotoxins in grain

Alongside stalls giving information allowing people to taste, smell and touch, the participating BOKU researchers also developed their own children’s programme.
According to the APA database, BOKU was cited 724 times between January 1, 2005 and December 31, 2005. This was a slight fall from the previous year. The 2005 statistics include all citations in Austria print media such as “Der Standard”, “Die Presse”, “Dolomiten”, “KTZ”, “Kleine Zeitung”, “Kurier”, “Kronen Zeitung”, “Neue Vorarlberger Tageszeitung”, “Neues Volksblatt”, “NÖ Nachrichten”, “OÖ Nachrichten”, “Salzburger Nachrichten”, “Tiroler Tageszeitung”, “Vorarlberger Nachrichten”, “Wiener Zeitung”, “Wirtschaftsblatt”, “Furche”, “profil”, “News”, “Wirtschaftswoche” and APA.

Not included are ORF reports and programmes (79), online editions of newspapers or local media. Experience has shown that these account for at least an additional two-thirds of the citations.

BOKU and its graduates

It is important to BOKU that each student who does not stay on as a doctoral student and/or in another position after completing their studies finds another position suiting their education. Therefore, in 2005 the university management and the graduate section of the BOKU academic programmes together founded the BOKU Alumni Association *(see http://alumni.boku.ac.at/).* This serves as the central point of contact for the university's graduates and is linked with the existing alumni associations.

The BOKU Alumni Association is a part of the university and incorporates the tasks of the Centre for Career Planning. It promotes, in co-operation with existing graduate associations, contact and interaction between graduates and the university and business and other institutions. A further aim of the Association is to help BOKU graduates find work, such as by publicising job adverts, advising on applications and CVs and helping with seminars and further training. Employment analysis gives information about the current job market in the BOKU's disciplines. For this purpose the published job adverts are used.

The job statistics *(see Table 46)* list the jobs advertised in each subject area and the total number of filled and non-fillled positions. Of a total of 518 published job adverts, 150 companies gave information about the results, which provided the basis for the statistics.

When it is taken into account that not all companies share information about the results of their job advertisements – in 2005 just a third of job offers were reported as being "filled" – and the average success rate is calculated, it is found that around half of positions advertised were filled *(see Table 47).*

A "Jobindex" is also produced *(see Table 48).* This compares the graduates in each subject with the number of jobs on offer. In the fields of Food and Biotechnology (0.52 graduates/position vacant), Agriculture (0.56), Cultivation and Water Management (0.53) and Forestry (0.32), there are theoretically between two and three jobs available per graduate. In the Landscape Planning (1.85) field, there is around one job for every two graduates.

In comparison with the 2004 figures (see intellectual capital report 2004), it can be seen that the Jobindex figures have improved particularly in the field of Forestry Management (2004: 0.9), whilst those in Landscape Planning have become significantly worse (2004: 0.8).

IT services

The role played by digital means of information transfer continued to grow in 2005. The role played by IT in BOKU's information management system thus continued to grow in importance and this is being reflected in BOKU's IT planning. The web and e-mail remain key aspects of IT-based communication. 2005 saw continued expansion of the information available on the web about all aspects of BOKU. The amount of information

Table 48

Societal and economic development: Jobindex 2005

Academic programme	Number of graduates	Jobindex
Forestry	19	0.32
Agriculture	62	0.56
Cultivation and water management	75	0.53
Landscape architecture and planning	102	1.85
Food Science and Biotechnology	78	0.52

Table 46

Societal and economic development: job statistics 2005

Academic programme	job offers	filled	not-filled
Forestry	60	9	5
Agriculture	111	14	11
Cultivation and water management	141	17	25
Landscape architecture and planning	55	9	7
Food Science and Biotechnology	151	27	26
Total	518	76	74
in %		14.67	14.29

Table 47

Social and economic development: projections of filled jobs

Academic programme	job offers	filled	not-filled
Forestry	60	39	21
Agriculture	111	62	49
Cultivation and water management	141	57	84
Landscape architecture and planning	55	31	24
Food Science and Biotechnology	151	77	74
Total	518	266	252
in %		51.4	48.6

available in 2005 (measured in January), was almost double that of the previous year, which was itself almost double that available at the start of the CMS (Content Management System) programme.

The strategy of distributed responsibility for web content, combined with an ingenious rights system, showed its worth within a year of its introduction: the amount of information available centrally via the CMS rose to almost 5,000 pages. Along with the volume on offer, the demand for BOKU online information

also rose. 2005 saw a continuing rise in the number of pages viewed, which reached its high point towards the end of the year. Almost 350,000 visits were recorded in November, a new peak, before December saw levels fall again as a result of the holidays *(see Figure 13).*

It is interesting to consider the number of pages viewed per visit. Recent developments would seem to confirm the 2004 hypothesis that new students and other users need first of all to find their bearings in the new information structure. The fact that, despite an almost fourfold increase in the amount of information on offer, the number of pages viewed per visit has remained constant or fallen slightly to a value of around five can however be taken as a sign that the navigation structure is functioning well. With regards to demand, it can be seen that, apart from central services such as searching, the education related areas are in particularly high demand. This is a clear sign of the importance of online information for the student target group.

In general, the analysis of online activity shows that BOKU places great importance on the quality of its web information. In 2005 alone, around 75,000 editorial procedures were carried out in order to achieve the high quality of the online information. The limit to the amount that can be done in terms of quality and quantity is represented by resources. The proportion of English language pages was not able to be increased in 2005 and remains at just over 20%. This is reflected in the usage statistics: more than two thirds of views were from German-speaking countries, and every second one was from within Austria.

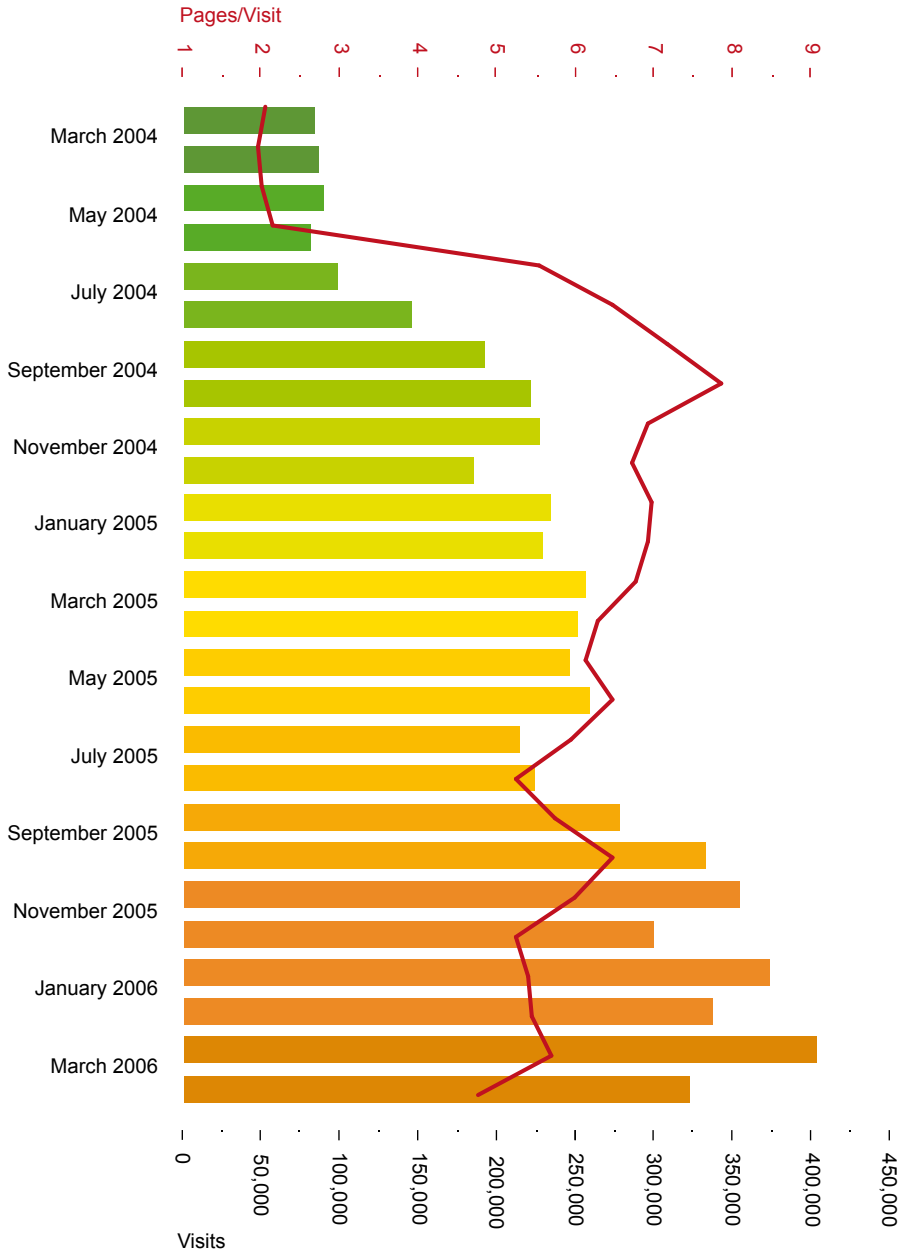


Figure 13:

Website visits (March 2004 bis March 2006)

3

The Future

Goals achieved and challenges ahead /
Validity declaration for validated environmental data /
Requirements according to GRI guidelies /
Success becomes visible – An overview of BOKU indicators

The future is open - goals achieved and challenges ahead

"We have achieved much, are in a good position and have many plans in the pipeline…"

In summary, it is true to say that BOKU has good reason to be pleased with the developments of the past few years, in particular from the perspective of intellectual capital report and the outcomes for the reporting year of 2005.

Education and continuing education

A particular success has been the transformation into a three-stage education architecture which gives Austrian and overseas students a broad and diversified education at both bachelor's and master's level, which then underwent consolidation in 2005. Students, graduates and any interested teaching staff are offered bespoke, needs-based taught courses as well as training and development courses in politics, economics and society using new teaching and learning methods, which are optimized with the help of research questions. It is clear that this process has not yet been completed but must be consolidated in the coming years. BOKU has invested in the future. A large study programme, including core subjects, involves contact with external experts from different sectors and guarantees an education based on practical experience for bachelor's students and gives graduates access to the next level of technical knowledge and skill. Despite the introduction of student fees five years ago, student numbers are growing overall and the reduction in the student numbers in their first semester caused by this has now levelled out. The number of students graduating each year, now around 10% of the total number of students, is now at a satisfactorily level and the attractiveness of degrees by changing them to bachelor's and master's degrees is clearly increased. This will, it is expected, in turn lead to more students graduating and more quickly in the near future. BOKU is highly internationalized in its education, especially with the universities in East and South East Europe. Furthermore, a positive development trend can be seen with selected universities and research centres (CGIAR) in the developing countries, especially Asia and Africa, which will become more intensive in the coming years. Efforts are also increasingly being made to offer programmes, especially those on a master's level, in English. In this way, BOKU becomes more attractive for international students in Europe but also from Africa and Asia and as far as America. It is therefore a goal of the teaching staff at BOKU to intensify and to offer blended-learning programmes directed towards the target groups. To be singled out from amongst these strategic teaching co-operations is the ELLS co-operation (Euro League for Life Science Universities) which enables new cross-border teaching programmes and contents to be developed and offered on a high international level. In this respect, BOKU can transfer and build on its leading competence in selected areas.

Research and development

In respect to its research, BOKU can clearly state that its organizational structure and scientists enable it to carry out excellent research and pursue the acquisition of successful research grants (e.g. on an EU level). BOKU has succeeded in acquiring considerable third-party funding which represents an indispensable source of income in addition to the global budget from the state. This high level must in any case be maintained but should also be developed further. Advanced and strengthened co-operation with Austria's economic and industrial business base and the development of strategic co-operation with research institutions external to the university or with junior state authorities are a key challenge for BOKU. By founding CD laboratories or competency centres, the partners can combine fundamental as well as application-oriented research and by using patenting, BOKU can increase the knowledge transfer or increase the transfer of the best minds in the economy and industry. This latter is an ideal basis for further co-operation. At the same time, the appearance of third parties guarantees high

income. The high levels of personnel funded by third parties is the perfect pre-condition for research achievements. And last but not least it succeeds in ensuring a constant potential source of junior members of staff who can be best trained by combining research and research-led education. There is no need to explain that this is a key challenge for the development of doctorate and PhD programs in the next few years.

Societal and economic development

BOKU provides external services to local authorities, corporations and the society. Furthermore, knowledge transfer to experts and end users is promoted through numerous public presentations. Nonetheless, BOKU experts are often asked to give interviews and political statements, which can be seen in their intensive presence in the media.

Major responsibilities for the "Responsible University"

BOKU has the potential to become the leading university for resource management and life sciences in Central Europe. This objective shall be reached by focused location policies and a corresponding thematic concentration. This will be the basis for delineating the research profile and pertaining national and international opportunities for education and continuing education.

Guiding principle for sustainability

The responsibility for sustainability inherent in the mission statement results in the necessity to integrate sustainability in all central functions of BOKU. Therefore, the conditions have to be created for incorporating sustainability in an institutional context, to integrate it in research, education and external services ("make sustainability transparent") and make it an integral part of every day processes ("practised sustainability").

Delineation of the profile and identification of the location

Strengthening the profile equates to safeguarding and intensifying the core process for topics, education and continuing education, research and development and societal and economic development (external services). Researchers employ their expertise to select given topics. BOKU will continue to support individuals and small working groups with outstanding scientific achievements in the key competencies of our university that are either unique in Austria, whose topics are nationally and internationally relevant or that are complementing mainstream research. The emphasis is placed on common guiding themes to achieve said objective, as well as overall projects and strengthening of the profile, in addition to ideas for actual development projects and steps to strengthen the key competencies in response to the current role of the field of competency.

BOKU pursues its goals in accordance with other universities, research and educational facilities, while intensifying existing partnerships and establishing new ones to strengthen the Austrian research and educational landscape through the benefit of synergies and to be competitive internationally.

Education and continuing education

BOKU will continue to meet the requirements of a university in educating young people to be responsible and highly qualified. BOKU seeks to offer an attractive working environment and career perspectives, strengthen Austria's future by means of qualified academics and a solid scientific elite. The previously adopted Bologna study architecture is supposed to be developed further in this direction. Here, BOKU seeks to facilitate the principle of research and education as one entity through its research culture that integrates nationally and internationally linked academic programmes, ranging from bachelor's to master's, doctoral and postdoc programmes. The BOKU opportunities for continuing education as self-supporting principle of knowledge transfer shall be continuously expanded and institutionalised in various areas together with the alumni umbrella

organisation, the economy and public administration. This shall establish an additional source of income in the medium term.

Doctoral programmes

Educating doctoral students is for BOKU a central success factor for the combination of research and education. Commendable scientific output and the integration in international projects facilitate networking of the university and individual career opportunities. BOKU is also responsible for integrating doctoral programmes in the Bologna architecture, provided that educational topics can be selected autonomously and the financial and structural conditions have been procured.

Quality assurance

All activities and their development are supported and monitored by a quality management system. Evaluation methods accord to international standards and facilitate different scientific orientations of the departments, requirements of modern education and responsibilities of a service-oriented management.

Ecological responsibility

BOKU shall continuously improve its environmental criteria. Thus, BOKU specific environmental goals shall be reached by actual measures that are to become an integral part of the BOKU environmental initiative. One of the most important environmental goals will be the implementation of a purchase system with the aim of protecting the environment. Thus, BOKU does not only attempt to reduce its ecological baggage but to also signal suppliers that environmental protection is a central priority at BOKU. This is also supposed to be made manifest at BOKU festivities (“fair festivities”). Furthermore, ecological construction and renovations performed according to environmental criteria are essential for BOKU, even though BOKU’s impact is limited given that all premises are government owned lease properties. However, for new construction projects ecological criteria will be required. Also for waste production, energy and water consumption BOKU has set improvement goals. Energy consumption shall be minimised in the long term, particularly at the Türkenschanze site.

Environmental programme 2006	Responsible body	Quarter/Year
Ecological purchases		
Replacing polysterene food containers with recyclable ones (or biodegrable materials) for the BOKU buffet (12,000 containers per year or 204 kg.)	BOKU buffet operator	2/2006
Using print materials with the Austrian environmental label for internal and external BOKU publications	PR department	2/2006
Using recyled paper in all copy machines (4.5 million sheets)	Rectorate	2/2006
Recommendation of the Rectorate for the departments to use recylced paper for all remaining tasks of the department (0.5 m sheets)	Rectorate Departments	2/2006
Recommendation of the Rectorate for the departments to purchase eclogical office supplies to be used by the department	Rectorate Departments	2/2006
Usage of non-polluting cleaning products for cleaning of the premises which is performed by an external cleaning company	EM (Environmental Manager) cleaning company	2/2006
Using waste collecting bags made of corn for containers with biological waste	UMB cleaning company	2/2006
Incresing organic food from currently 10% to 40% for the cafeterias at Türkenschanze and Muthgasse	UMB/cafeterias at Türken-schanze and Muthgasse	2/2006
Evaluation of BOKU merchandise and listing ecologically unsafe articles	Facility Management Türkenschanze	3/2006
Gradual swith to from energy to renewable energy sources	Facility Management Türkenschanze	2/2007
Construction and renovation according to ecological criteria		
Developing ecological purchase criteria for construction and renovation activities (partially in co-operation with the BIG)	UMB	3/2006
Making BOKU events (“fair parties”) more green		
Compilation of criteria	Rectorate, department event management	3/2006
Reducing total paper consumption by 10% until 2007 (in comparison to 2005)		
Instructing departments about adequate double-sided printing	UMB	2/2006
Further optimisation of the air quality on the premises		
Providing environmental information about filtering abilities of plants	UMB	2/2006
Informing staff about adequate heating (minimising use of radiators) and ventilation	UMB UAps	3/2006
Replacing windows at Mendel/Liebig-Haus (three stages of expansion)	BIG	3/2006
Optimised data assessment (additional measuring equipment) as basis for consumer based energy controlling and planning of further cost reduction measures at Türkenschanze	Facility Management Türkenschanze	3/2006

Warm water supply at Muthgasse: Replacing the additional electric pipe heating by circulation pipes, 80.000 kwh energy saved	Facility Management Muthgasse	4/2006
Reducing traffic related emissions		
Upgrading of seven diesel vehicles of the fleet with particle filters	Facility Management Türkenschanze	3/2006
Analysing the situation for bicycle riders at Türkenschanze to increase bicycle usage	UMB Department of transportation	2/2006
Developing a mobility concept for the new location in Tulln	UMB Department of transportation	3/2006
Reducing water consumption		
Upgrading the neutralisation unit for water supply at Muthgasse to supply spring water. Water consumption can be reduced by 2,000m^3 annually	Facility Management Muthgasse	3/2006
Improving waste management		
Cutting the usage of 18,000 waste bags in recycling containers through a system of removable containers that facilitate cleaning	Facility Management Türkenschanze/UMB	2/2006
Improving potential recyclables system (office and public area) around Exner building location	Facility Management Türkenschanze/UMB	3/2006
Improving potential recyclables system (public area) on the main premises and the entrance area at Muthgasse	Facility Management Türkenschanze/UMB	3/2006
Analysing waste at Exner and Schwackhöfer buildings	Department of Waste Management	3/2006
Web based data assessment of hazardous waste and automated generation of transport declarations	UMB ZID	3/2006
Improving the handling of chemicals		
Improving storage of chemicals at several locations by disposing 20 collecting trays	Facility Management Türkenschanze	2/2006
Web based data assessment of purchased toxins on the BOKU homepage	UMB, ZID	3/2006
Improving management systems		
Research project “Development of sustainability indicators for universities based on BOKU”	Rectorate Sustainability platform	4/2006
Improving environmental awareness and communication		
Ideas competition on the protection of the environment	UMB	3/2006
Updating BOKU homepage by adding the topic “Protection of the environment at the workplace”	UMB, ZID	2/2006
Adding environmental data to the intellectual capital report in the sense of a sustainability report “Responsible University”	Rectorate Research Support Office	2/2006

Social responsibility

As stipulated by the Universities Act 2002, social responsibility towards humans and the environment, which can only be practiced through social competency, is a particularly important aim for BOKU considering its mission statement that adheres to sustainability. Thus, social responsibility is to be integrated in the core processes of research, education and societal and economic development, as well as the interaction with its own staff. BOKU applies various measures in this context.

In the medium term, the university management will implement various tasks as part of its internal management processes, as stipulated by the "European Charter for Researchers and Code of Conduct for the Recruitment of Researchers", an initiative launched by the European Commission and signed by BOKU. The initiative distinguishes between the responsibilities of the researcher and those of his/her employer.

The responsibilities of researchers include respecting ethical standards, professional responsibility, adhering to established research methods, societal responsibility and meeting management tasks.

Responsibilities of the employer include equal opportunities, creating a (motivating) research context, flexible, gender balanced and family friendly work conditions, balanced male-female-ratio, career advancement measures (see below), facilitating mobility, introduction of transparent evaluation methods etc.

The complete document is available for download on the homepage of DG Research of the European Commission at: *http://ec.europa.eu/eracareers/pdf/eur_21620_de-en.pdf.*

One of the first measures planned by BOKU will be an addition to "Cross-Mentoring in Federal Service", a mentoring programme initiated by the Federal Ministry for Health and Women's Issues. Its objective is to increase the percentage of females in doctoral programmes. BOKU professors and lecturers with a postdoctoral teaching qualification mentor potential students interested in pursuing a dissertation. The mentoring process lasts for six months and meetings with the new doctoral student are held on a regular basis. Furthermore, assistance is provided for possible obstacles and with designating a dissertation topic and an advisor.

Mentoring helps to share experiences and serve as an example. Aside from a mentoring introduction specifically for students, an informative event providing further information about doctoral studies, workshops (such as for writing scientific papers, presentation methods and speech training) and a joint event at the beginning and end of each semester are planned. BOKU is supposed to implement the programme by 2007.

Modelled on the "Buddy System", as initiated by the renowned Weizmann Institute (Israel), BOKU is preparing a similar system, where students volunteer to spend four hours per week with a child from a socially disadvantaged family. Participating students will benefit from waived tuition and adequate compensation. Thus, BOKU promotes social responsibility and aims at preparing its students with this sensitivity for different, also social responsibilities in and for society after completing their education.

The social fund for BOKU students is a joint initiative of the Austrian National Students Union and BOKU. Its objective is to support socially disadvantaged students. Student with children and foreign nationals are particularly considered for funding. The grant, financed at 15,000 euro by the university, is awarded by the Austrian National Students Union.

Success becomes visible – Overview of indicators used for the intellectual capital report

Table 2

Staff on due dates October 15th 2005 and October 15th 2004 (II.1.1)

	2005			2004		
Staff equivalent to full time positions	Females	Males	Total	Females	Males	Total
Total number of academic and art staff[1]	77.0	269.3	346.3	69.8	261.5	331.2
Professors[2]	8.0	52.8	60.8	7.0	51.7	58.7
Assistant lecturers and other academic and art staff[3]	69.0	216.5	285.5	62.8	209.8	272.5
including lecturers[4]	21.3	100.5	121.8	21.3	97.0	118.3
Total number of general staff[5]	227.9	195.6	423.5	240.0	206.2	446.2
Total[6]	304.9	464.9	769.8	309.7	467.6	777.4

1 functions 11, 14, 16, 21 according to subsection 2.6 of Appendix 1BidokVUni.
2 functions 11 according to subsection 2.6 of Appendix 1BidokVUni.
3 functions 14, 16, 21 according to subsection 2.6 of Appendix 1BidokVUni.
4 functions 14 according to subsection 2.6 of Appendix 1BidokVUni.
5 functions 23, 40 to 70 according to subsection 2.6 of Appendix 1BidokVUni.
6 functions 11, 14, 16, 21, 23, 40 to 70 according to subsection 2.6 of Appendix 1BidokVUni.

	2005			2004		
Full and part time staff (head-count excluding staff on temporary leave)	Females	Males	Total	Females	Males	Total
Total number of academic and art staff[1]	529	840	1,369	440	787	1,227
Professors[2]	8	55	63	9	54	63
Assistant lecturers and other academic and art staff[3]	521	785	1,306	431	733	1,164
including lecturers[4]	23	101	124	22	98	120
including staff supported by third-party funded R&D projects[5]	241	264	505	200	239	439
Total number of general staff[6]	261	208	469	274	221	495
Total[7]	774	1,035	1.809	698	990	1,688

1 functions 11, 12, 14, 16, 17, 21, 24, 25, 30 according to subsection 2.6 of Appendix 1BidokVUni.
2 functions 11, 12 according to subsection 2.6 of Appendix 1BidokVUni.
3 functions 14, 16, 17, 21, 24, 25, 30 according to subsection 2.6 of Appendix 1BidokVUni.
4 functions 14 according to subsection 2.6 of Appendix 1BidokVUni.
5 functions 24, 25 according to subsection 2.6 of Appendix 1BidokVUni.
6 functions 23, 40 to 70 according to subsection 2.6 of Appendix 1BidokVUni.
7 functions 11, 12, 14, 16, 17, 21, 23, 24, 25, 30, 40 to 70 according to subsection 2.6 of Appendix 1BidokVUni. Individuals in more than one function are included only once.

Table 4

Number of appointments to the university (II.1.3)

	2005			2004		
	Females	Males	Total	Females	Males	Total
In-house appointments	–	–	–	–	2	2
Other Austrian appointments	–	1	1	–	1	1
EU	1	–	1	–	1	1
Third countries	–	1	1	–	–	–
Total	1	2	3	–	4	4

Table 5

Number of teaching qualifications (habilitations) awarded in 2004 and 2005 (II.1.2)

2005			2004		
Females	Males	Total	Females	Males	Total
–	5	5	4	15	19

Table 7

Funding for measures promoting equal opportunities for men and women and affirmative action for women euro (II.2.1)

	2005	2004
Funding for measures promoting equal opportunities for men and women and affirmative action for women in euro	45,500	27,963

Table 8

Number of staff active at special institutions (head-count) (II.2.3)

	2005			2004		
Type of institution	Females	Males	Total	Females	Males	Total
Equal opportunities working group according to §42 of the Universities Act 2002	11.5	2	13.5	12	2	14
including staff on a voluntary basis	10	2	12	10	2	12
Arbitration committee according to §43 of the Universities Act 2002	3	3	6	3	3	6
Organisational unit for coordinating matters pertaining to equal opportunities, affirmative action programmes for women, and gender studies according to item19(2)7 Universities Act 2002	0.5	–	0.5	–	–	–
Institutions that promote non-university contacts and co-operation outside of the university	13.5	7	20.5	13.5	7	20.5
including the Center for International Relations	6	2	8	6	2	8
including the Center for Education	5	2	7	5	2	7
including Institutions that promote educational development (e-learning)	–	1	1	–	1	1
including the Research Support Office	2.5	3	5.5	2.5	3	5.5
Total						

Table 9

Costs for available online research databases in euro (II.2.7)

	2005	2004
Costs for available online research data bases in euro	127,161	296,043

Table 10

Costs for available scientific journals in euro (II.2.8)

Type of publication	2005	2004
Print journals	651,767	683,271
Online journals	63,399	52,323
Total	715,166	735,594

Table 11

Total funding for large equipment for research and development in euro (II.2.9)

	2005	2004
Total funding for large equipment for research and development in Euro	2,165,600	597,600

Table 12

Proceeds from sponsoring in euro (II.2.10)

	2005	2004
Sponsoring income in Euro	39,800	165,969

Table 13

Number of partner institutions/ enterprises incorporated in co-operation agreements (II.3.2)

	2005				2004			
	Home country of co-operation partner				Home country of co-operation partner			
Partner institution/enterprise	Austria	EU	Third Countries	Total	Austria	EU	Third Countries	Total
Universities	5	17	43	65	2	15	42	59
Non-university R&D institutions	3	–	–	3	2	–	–	2
Enterprises	13	–	1	14	12	–	1	13
Schools	–	–	–	–	–	–	–	–
Non-scientific media (newspapers, magazines)	–	–	–	–	–	–	–	–
Other	3	–	–	3	3	–	–	3
Total	24	17	44	85	19	15	43	77

Table 14

Number of staff with functions in scientific journals (II.3.3)

		2005			2004		
	Refereed	F	M	Total	F	M	Total
Total	in refereed scientific journals	16.5	61.2	77.7	13.5	62.8	76.3
	in other scientific journals	2.5	16.8	19.3	2.5	14.2	16.7
	Total	19.0	78.0	97.0	16.0	77.0	93.0

Table 15

Number of borrowings from university libraries (II.3.5)

Type of borrower	2005	2004
students	82,863	74,906
teaching staff/other university members	14,433	12,055
non-affiliates of the university	26,101	25,376
Total	123,397	112,337

Table 16

Number of university library activities (II.3.6)

Type of activity	2004	2005
exhibitions	12	19
training courses	13	–
guided tours of the library	42	24
Total	67	43

Table 27:

Overview of BOKU's academic staff (full and part time basis) (listed as full time equivalents)

	2005		
Full and part time staff (full time equivalents)	Females	Males	Total
Total number of scientific and art staff[1]	315.0	568.1	883.1
Professors[2]	8.0	51.8	59.8
Assistant lecturers and other scientific and art staff[3]	307.0	516.3	823.3
including assistant professors[4]	21.3	100.5	121.8
including staff supported by thrid-party R&D projects[5]	193.6	228.1	421.7
academic staff without a post doctoral teaching qualification[6]	92.1	187.7	279.9

1 functions 11, 12, 14, 16, 17, 21, 24, 25, 30 according to subsection 2.6 of Appendix 1BidokVUni.
2 functions 11, 12 according to subsection 2.6 of Appendix 1BidokVUni.
3 functions 14, 16, 17, 21, 24, 25, 30 according to subsection 2.6 of Appendix 1BidokVUni.
4 functions 14 according to subsection 2.6 of Appendix 1BidokVUni.
5 functions 24, 25 according to subsection 2.6 of Appendix 1BidokVUni.
6 functions 16, 17, 21, 30 according to subsection 2.6 of Appendix 1BidokVUni.

Table 17

Average length of study in semesters in the academic year of 2004/05

Curriculum[1]			Stage of studies: Orientation phase (First stage of studies)			Remaining period of studies (further stages of studies) Total			Total		
			Females	Males	Total	Females	Males	Total	Females	Males	Total
4		NATURAL SCIENCES									
	42	Biological Sciences									
5		ENGINEERING, METALLURGY CIVIL ENGINEERING	5.7	6.1	5.8	9.6	10.0	9.8	15.3	16.1	15.7
	52	Engineering and technical professions									
	54	Metallurgy and mining	6.1	6.2	6.1	8.8	8.3	8.4	14.9	14.6	14.6
	58	Architecture and civil engineering	5.0	6.0	5.4	10.3	11.0	10.7	15.3	16.9	16.1
6		AGRICULTURAL SCIENCES	6.7	5.7	6.4	8.8	7.8	7.9	15.5	13.5	14.3
	62	Agriculture, forestry and fisheries and allied sciences	6.7	5.7	6.4	8.8	7.8	7.9	15.5	13.5	14.3
8		SERVICES									
	85	Environmental protection									
Total			**6.3**	**6.0**	**6.1**	**9.0**	**9.3**	**9.1**	**15.3**	**15.3**	**15.3**

1 On level 1–2 of the ISCED system

Table 18

Number of students on due date of November 30th 2005 according to subsection 7 (5) UnistEV 2004 (III.1.5)

		Type of student								
		degree programme students			non-degree programme student			Total		
	Nationality	Females	Males	Total	Females	Males	Total	Females	Males	Total
First semester students[1]	Austria	469	569	1,038	7	8	15	476	577	1,053
	EU	118	88	206	1	2	3	119	90	209
	Third countries	42	58	100	15	40	55	57	98	155
	Total	629	715	1,344	23	50	73	652	765	1,417
Second and higher semester students[2]	Austria	1,537	2,062	3,599	11	21	32	1,548	2,083	3,631
	EU	117	127	244	3	4	7	120	131	251
	Third countries	113	138	251	27	42	69	140	180	320
	Total	1,767	2,327	4,094	41	67	108	1,808	2,394	4,202
Total number of students	Austria	2,006	2,631	4,637	18	29	47	2,024	2,660	4,684
	EU	235	215	450	4	6	10	239	221	460
	Third countries	155	196	351	42	82	124	197	278	475
	Total	2,396	3,042	5,438	64	117	181	2,460	3,159	5,619

1 Students admitted to the university in a given winter semester (number of individuals PN according to Appendix 5 of UniStEV 2004).
2 Students who have been admitted to the university during the previous semester (number of individuals PU according to Appendix 5 of UniStEV 2004 minus number of individuals PN).

Table 19

Number of students on winter semester due date according to subsection 7 (5) UniStEV 2004 (III.1.5)

		Winter semester 2005			Winter semester 2004		
		type of student			type of student		
	Nationality	Degree program student	Non-degree program student	Total	Degree program student	Non-degree program student	Total
First semester students[1]	Austria	1,038	15	1,053	804	14	818
	EU	206	3	209	159	1	160
	Third countries	100	55	155	54	70	124
	Total	1,344	73	1,417	1,017	85	1,102
Second and higher semester students[2]	Austria	3,599	32	3,631	3,203	28	3,231
	EU	244	7	251	207	22	229
	Third countries	251	69	320	202	58	260
	Total	4,094	108	4,202	3,612	108	3,720
Total number of students	Austria	4,637	47	4,684	4,007	42	4,049
	EU	450	10	460	366	23	389
	Third countries	351	124	475	256	128	384
	Total	5,438	181	5,619	4,629	193	4,822

1 Students admitted to the university in a given winter semester (number of individuals PN according to Appendix 5 of UniStEV 2004).
2 Students who have been admitted to the university during the previous semester (number of individuals PU according to Appendix 5 of UniStEV 2004 minus number of individuals PN).

Table 20

Degree programme students actively taking exams within the minimum duration of studies according to the curriculum and in addition to one tolerance semester in bachelor's, master's and diploma programs in the academic year of 2004/05 (III.1.6)

Nationality	Females	Males	Total
Austria	1,164	1,342	2,506
Other countries	250	201	451
Total	1,414	1,543	2,957

Table 23

Number of degree programme students participating in international mobility programs on due date of November 30th 2005 according to UniStEV 2004, *outgoing* (III.1.8)

	Host country								
	EU			Third countries			Total		
Type of mobility programme	Females	Males	Total	Females	Males	Total	Females	Males	Total
CEEPUS	–	1	1	–	–	–	–	1	1
ERASMUS	38	28	66	5	2	7	43	30	73
LEONARDO da VINCI	1	–	1	–	–	–	1	–	1
Other	5	1	6	23	8	31	28	9	37
Total	44	30	74	28	10	38	72	40	112

Table 24

Number of degree programme students participating in international mobility programs on due date of November 30th 2004 according to UniStEV 2004, *incoming* (III.1.9)

	Nationality								
	EU			Third countries			Total		
Type of mobility programme	Females	Males	Total	Females	Males	Total	Females	Males	Total
CEEPUS	3	1	4	–	1	1	3	2	5
ERASMUS	54	23	77	4	1	5	58	24	82
LEONARDO da VINCI	–	–	–	–	–	–	–	–	–
Other	3	1	4	17	20	37	20	21	41
Total	60	25	85	21	22	43	81	47	128

Table 25

Number of degree programme students participating in international mobility programmes on due date of November 30th 2004 according to UniStEV 2004, *outgoing* (III.1.8)

	Host country								
	EU			Third countries			Total		
Type of mobility programme	Females	Males	Total	Females	Males	Total	Females	Males	Total
CEEPUS	–	–	–	–	–	–	–	–	–
ERASMUS	34	17	51	2	5	7	36	22	58
LEONARDO da VINCI	1	1	2	–	–	–	1	1	2
Other	4	1	5	10	10	20	14	11	25
Total	39	19	58	12	15	27	51	34	85

Table 26

Number of degree programme students participating in international mobility programs on due date of November 30th 2005 according to UniStEV 2004, *incoming* (III.1.8)

	Nationality								
	EU			Third countries			Total		
Type of mobility programme	Females	Males	Total	Females	Males	Total	Females	Males	Total
CEEPUS	–	1	1	–	–	–	–	1	1
ERASMUS	64	31	95	7	8	15	71	39	110
LEONARDO da VINCI	–	–	–	–	-	–	-	–	-
Other	3	2	5	19	18	37	22	20	42
Total	67	34	101	26	26	52	93	60	153

Table 21
Number of degree programmes students on due date November 30th according to UniStEV 2004 (III.1.7)

		Nationality											
		Austria			EU			Third countries			Total		
Curriculum[1]		Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total
4 NATURAL SCIENCES													
42	Biological Sciences												
44	Exact Sciences												
46	Mathematics and Statistics												
5 ENGINEERING, METALLURGY CIVIL ENGINEERING		796	1,313	2,109	71	70	141	74	77	151	941	1,460	2,401
52	Engineering and technical professions												
54	Metallurgy and mining	595	584	1,179	47	26	73	57	49	106	699	659	1,358
58	Architecture and civil engineering	201	729	930	24	44	68	17	28	45	242	801	1,043
6 AGRICULTURAL SCIENCES		1,277	1,462	2,739	167	152	319	80	115	195	1,524	1,729	3,253
62	Agriculture, forestry and fisheries and allied sciences	1,277	1,462	2,739	167	152	319	80	115	195	1,524	1,729	3,253
7 MEDICAL AND SOCIAL SCIENCES													
8 SERVICES		4	6	10	8	9	17	3	6	9	15	21	36
81	Personal services												
84	Transportaton services												
85	Environmental protection	4	6	10	8	9	17	3	6	9	15	21	36
86	Safety services												
9 Unknown/No specific data available		15	26	41							15	26	41
99	Unknown/No specific data available	15	26	41							15	26	41
Total		2,092	2,807	4,899	246	231	477	157	198	355	2,495	3,236	5,731

1 On level 1–2 of ISCED classification

Table 22
Number of students admitted to master's or doctorate programmes without an Austrian bachelor's, master's or diploma degree on due date November 30th according to UniStEV 2004 (III. 1.10)

		Nationality											
		Austria			EU			Third countries			Total		
Curriculum[1]		Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total
4 NATURAL SCIENCES													
42 Biological Sciences													
5 ENGINEERING, METALLURGY CIVIL ENGINEERING		1	10	11	9	9	18	15	13	28	25	32	57
52 Engineering and technical professions													
54 Metallurgy and mining		1	3	4	6	1	7	7	8	15	14	12	26
58 Architecture and civil engineering		–	7	7	3	8	11	8	5	13	11	20	31
6 AGRICULTURAL SCIENCES		8	9	17	17	13	30	11	25	36	36	47	83
62 Agriculture, forestry and fisheries and allied sciences		8	9	17	17	13	30	11	25	36	36	47	83
8 SERVICES		1	1	2	7	7	14	3	4	7	11	12	23
85 Environmental protection		1	1	2	7	7	14	3	4	7	11	12	23
	Type of academic programme												
Total	Master degree	10	13	23	22	24	46	14	13	27	46	50	96
	Doctorate degree	–	7	7	11	5	16	15	29	44	26	41	67
	Total	10	20	30	33	29	62	29	42	71	72	91	163

1 On level 1–2 of ISCED classification

Table 28

Number of ongoing projects within research and development from January 1st 2002 onward supported by third-party funds (III.2.2)

Commissioning party/funding organisation	2005	2004
EU	79.0	55.3
Federation	143.8	95.0
including ministries	118.8	78.9
Province	57.3	28.4
Municipalities and local authorities	20.9	10.1
Authorities in the public sector outside of the government (according to Statistics Austria)	19.3	11.1
FWF	58.0	53.0
other funding institutions primarily sponsored by federal funds	14.2	6.2
corporations	93.4	56.8
legal representations of interest	7.3	4.6
foundations and other sponsoring organisations	14.7	12.8
other	62.2	35.6
Total	570.0	369.0

1 Classification of sponsors in the public sector according to the classification provided by Statistics Austria (national economy, allocated funding)

Table 29

Number of ongoing within research and development in 2004 and 2005, from January 1st 2002 onward and financed by third-party funds[2] (III.2.2)

	2005			2004		
Commissioning party/funding organisation	GLF	AF	EE	GLF	AF	EE
EU	13.3	64.8	1.0	10.0	44.3	1.0
Federation	20.6	122.3	1.0	13.0	82.0	–
including ministries	17.6	100.2	1.0	11.0	67.9	–
Province	2.3	54.0	1.0	1.0	26.4	1.0
Municipalities and local authorities	0.3	20.6	–	–	10.1	–
Authorities in the public sector outside of the government (according to Statistics Austria)	1.6	17.7	–	1.0	10.1	–
FWF	53.0	5.0	–	46.0	7.0	–
other funding institutions primarily sponsored by federal funds	3.0	10.2	1.0	–	5.2	1.0
corporations	11.0	72.4	10.0	8.0	40.8	8.0
legal representations of interest	2.0	5.3	–	1.0	3.6	–
foundations and other sponsoring organisations	5.3	9.3	–	4.0	8.8	–
other	7.7	54.5	–	3.0	32.6	–
Total	120.0	436.0	15.0	87.0	271.0	11.0

1 Classification of sponsors in the public sector according to the classification of Statistics Austria (national economy, allocated funding)
2 Type of research: FR (fundamental research), AR (applied research), ED (experimental development)

Table 33

Number of doctoral programmes on the winter semester due date 2005 according to subsection 7 (5) UniStEV 2004 (III.2.6)

Curriculum[1]		Type of doctoral programmes	Nationality: Austria Females	Austria Males	Austria Total	EU Females	EU Males	EU Total	Third countries Females	Third countries Males	Third countries Total	Total Females	Total Males	Total Total
4	NATURAL SCIENCES	PhD programme												
		other doctoral programmes												
		Total												
5	ENGINEERING, METALLURGY, CIVIL ENGINEERING	PhD programme												
		other doctoral programmes	77	107	184	15	9	24	25	28	53	117	144	261
		Total	77	107	184	15	9	24	25	28	53	117	144	261
	54 Metallurgy and mining	PhD programme												
		other doctoral programmes	63	56	119	7	5	12	16	17	33	86	78	164
		Total	63	56	119	7	5	12	16	17	33	86	78	164
	58 Architecture and civil engineering	PhD programme												
		other doctoral programmes	14	51	65	8	4	12	9	11	20	31	66	97
		Total	14	51	65	8	4	12	9	11	20	31	66	97
6	AGRICULTURAL SCIENCES	PhD programme												
		other doctoral programmes	64	124	188	17	21	38	21	43	64	102	188	290
		Total	64	124	188	17	21	38	21	43	64	102	188	290
	62 Agriculture, forestry and fisheries and allied sciences	PhD programme												
		other doctoral programmes	64	124	188	17	21	38	21	43	64	102	188	290
		Total	64	124	188	17	21	38	21	43	64	102	188	290
Total		PhD programme	–	–	–	–	–	–	–	–	–	–	–	–
		other doctoral programmes	141	231	372	32	30	62	46	71	117	219	332	551
		Total	141	231	372	32	30	62	46	71	117	219	332	551

1 On level 1–2 of ISCED classification

Table 34

Number of doctoral programmes on winter semester due date according to subsection 7 (5) UniStEV 2004 (III.2.6)

Curriculum[1]		Type of doctoral programmes	Winter semester 2005				Wintersemester 2004			
			Austria	EU	Third countries	Total	Austria	EU	Third countries	Total
4	NATURAL SCIENCES	PhD programme								
		other doctoral programmes								
		Total								
5	Natural Sciences	PhD programme								
		other doctoral programmes	184	24	53	261	178	21	38	237
		Total	184	24	53	261	178	21	38	237
54	Metallurgy and mining	PhD programme								
		other doctoral programmes	119	12	33	164	113	15	23	151
		Total	119	12	33	164	113	15	23	151
58	Architecture and civil engineering	PhD programme								
		other doctoral programmes	65	12	20	97	65	6	15	86
		Total	65	12	20	97	65	6	15	86
6	AGRICULTURAL SCIENCES	PhD programme								
		other doctoral programmes	188	38	64	290	181	29	50	260
		Total	188	38	64	290	181	29	50	260
62	Agriculture, forestry and fisheries and allied sciences	PhD programme								
		other doctoral programmes	188	38	64	290	181	29	50	260
		Total	188	38	64	290	181	29	50	260
Total		PhD programme								
		other doctoral programmes	372	62	117	551	359	50	88	497
		Total	372	62	117	551	359	50	88	497

1 On level 1–2 of ISCED classification

Table 37

Number of degrees awarded in the academic year of 2004/05 (IV.1.1)

Curriculum[1]		Type of academic programme	Nationality: Austria Females	Austria Males	Austria Total	EU Females	EU Males	EU Total	Third countries Females	Third countries Males	Third countries Total	Total Females	Total Males	Total Total
4	NATURAL SCIENCES	First degrees												
		Further degrees												
		Total												
5	ENGINEERING, METALLURGY CIVIL ENGINEERING	First degrees	62	94	156	2	1	3	–	1	1	64	96	160
		Further degrees	23	21	44	3	3	6	2	8	10	28	32	60
		Total	85	115	200	5	4	9	2	9	11	92	128	220
52	Engineering and technical professions	First degrees												
		Further degrees												
		Total												
54	Metallurgy and mining	First degrees	45	36	81	1	–	1	–	1	1	46	37	83
		Further degrees	17	14	31	3	2	5	2	5	7	22	21	43
		Total	62	50	112	4	2	6	2	6	8	68	58	126
58	Architecture and civil engineering	First degrees	17	58	75	1	1	2	–	–	–	18	59	77
		Further degrees	6	7	13	–	1	1	–	3	3	6	11	17
		Total	23	65	88	1	2	3	–	3	3	24	70	94
6	AGRICULTURAL SCIENCES	First degrees	94	75	169	7	11	18	2	1	3	103	87	190
		Further degrees	12	13	25	1	1	2	5	14	19	18	28	46
		Total	106	88	194	8	12	20	7	15	22	121	115	236
62	Agriculture, forestry and fisheries and allied sciences	First degrees	94	75	169	7	11	18	2	1	3	103	87	190
		Further degrees	12	13	25	1	1	2	5	14	19	18	28	46
		Total	106	88	194	8	12	20	7	15	22	121	115	236
8	SERVICES	First degrees												
		Further degrees		2	2								2	2
		Total		2	2								2	2
85	Environmental protection	First degrees												
		Further degrees		2	2								2	2
		Total		2	2								2	2

86	Safety services	First degrees											
		Further degrees											
		Total											
9	Unknown/No specific data available	First degrees	2	5	7							2	5	7
		Further degrees											
		Total	2	5	7							2	5	7
99	Unknown/No specific data available	First degrees	2	5	7							2	5	7
		Further degrees											
		Total	2	5	7							2	5	7

	Type of academic programme											
Total	First degrees	158	174	332	9	12	21	2	2	4	169	188	357
	including diploma degrees	151	167	318	9	12	21	1	2	3	161	181	342
	including bachelor's degrees	7	7	14	–	–	–	1	–	1	8	7	15
	Professional degrees	35	36	71	4	4	8	7	22	29	46	62	108
	including master's degrees	1	4	5	–	–	–	1	5	6	2	9	11
	including doctoral degrees	34	32	66	4	4	8	6	17	23	44	53	97
	Total	193	210	403	13	16	29	9	24	33	215	250	465
	including diploma degrees	151	167	318	9	12	21	1	2	3	161	181	342
	including bachelor's degrees	7	7	14	–	–	–	1	–	1	8	7	15
	including master's degrees	1	4	5	–	–	–	1	5	6	2	9	11
	including doctoral degrees	34	32	66	4	4	8	6	17	23	44	53	97

1 On level 1–2 of ISCED classification

Table 36

Number of degrees awarded in the academic years 2003/04 and 2004/05 (IV.1.1)

Curriculum[1]	Type of programme	2004/05 Nationality				2003/04 Nationality			
		Austria	EU	Third countries	Total	Austria	EU	Third countries	Total
4 NATURAL SCIENCES	First degrees								
	Further degrees								
	Total								
5 ENGINEERING, METALLURGY CIVIL ENGINEERING	First degrees	156	3	1	160	149	6	2	157
	Further degrees	44	6	10	60	46	1	6	53
	Total	200	9	11	220	195	7	8	210
52 Engineering and technical professions	First degrees								
	Further degrees								
	Total								
54 Metallurgy and mining	First degrees	81	1	1	83	58	1	2	61
	Further degrees	31	5	7	43	33	–	2	35
	Total	112	6	8	126	91	1	4	96
58 Architecture and civil engineering	First degrees	75	2	–	77	91	5	–	96
	Further degrees	13	1	3	17	13	1	4	18
	Total	88	3	3	94	104	6	4	114
6 AGRICULTURAL SCIENCES	First degrees	169	18	3	190	170	23	3	196
	Further degrees	25	2	19	46	30	7	11	48
	Total	194	20	22	236	200	30	14	244
62 Agriculture, forestry and fisheries and allied sciences	First degrees	169	18	3	190	170	23	3	196
	Further degrees	25	2	19	46	30	7	11	48
	Total	194	20	22	236	200	30	14	244
8 SERVICES	First degrees								
	Further degrees	2			2				
	Total	2			2				
85 Environmental protection	First degrees								
	Further degrees	2			2				
	Total	2			2				
86 Safety services	First degrees								
	Further degrees								
	Total								
9 Unknown/No specific data available	First degrees	7			7	12			12
	Further degrees								
	Total	7			7	12			12
99 Unknown/No specific data available	First degrees	7			7	12			12
	Further degrees								
	Total	7			7	12			12

	Type of academic programme	2004/05				2003/04			
Total	First degrees	332	21	4	357	331	29	5	365
	including diploma degrees	318	21	3	342	328	29	5	362
	including bachelor's degrees	14	–	1	15	3	–	–	3
	Professional degrees	71	8	29	108	76	8	17	101
	including master's degrees	5	–	6	11	1	–	6	7
	including doctorate degrees	66	8	23	97	75	8	11	94
	Total	403	29	33	465	407	37	22	466
	including diploma degrees	318	21	3	342	328	29	5	362
	including bachelor's degrees	14	–	1	15	3	–	–	3
	including master's degrees	5	–	6	11	1	–	6	7
	including doctorate degrees	66	8	23	97	75	8	11	94

1 On level 1–2 of ISCED classification

Table 38

Number of degrees awarded with funded temporary stays abroad during study for the academic years of 2004/05 (IV.1.2)

Country hosting temporary stay abroad	Females	Males	Total
EU	33	35	68
Third countries	16	24	40
Total	49	59	108

Table 39

Number of degrees awarded within the minimum duration of studies in addition to one tolerance semester in the academic year of 2004/05 (IV.1.4)

Curriculum[1]		Type of programme	Females	Males	Total
4	NATURAL SCIENCES	First degrees			
		Further degrees			
		Total			
5	ENGINEERING, METALLURGY CIVIL ENGINEERING	First degrees	8	17	25
		Further degrees	11	7	18
		Total	19	24	43
54	Metallurgy and mining	First degrees	8	8	16
		Further degrees	7	4	11
		Total	15	12	27
58	Architecture and civil engineering	First degrees	–	9	9
		Further degrees	4	3	7
		Total	4	12	16
6	AGRICULTURAL SCIENCES	First degrees	24	31	55
		Further degrees	7	10	17
		Total	31	41	72
62	Agriculture, forestry and fisheries and allied sciences	First degrees	24	31	55
		Further degrees	7	10	17
		Total	31	41	72
8	SERVICES	First degrees	–	–	–
		Further degrees	–	2	2
		Total	–	2	2
85	Environmental protection	First degrees	–	–	–
		Further degrees	–	2	2
		Total	–	2	2
9	Unknown/No specific data available	First degrees	2	4	6
		Further degrees	–	–	–
		Total	2	4	6
99	Unknown/No specific data available	First degrees	2	4	6
		Further degrees	–	–	–
		Total	2	4	6

	Type of academic programme (number of tolerance semesters)			
Total	First degrees	34	52	86
	including diploma degrees (2)	32	51	83
	including bachelor's degrees (1)	2	1	3
	Professional degrees	18	19	37
	including master's degrees (1)	2	9	11
	including doctoral degrees (1)	16	10	26
	Total	52	71	123
	including diploma degrees (2)	32	51	83
	including bachelor's degrees (1)	2	1	3
	including master's degrees (1)	2	9	11
	including doctoral degrees (1)	16	10	26

1 On level 1–2 of ISCED classification

Table 41

Number of doctoral degrees awarded in the academic year of 2004/05 (IV.2.1)

Curriculum[1]		Type of doctorate programme	Nationality											
			Austria			EU			Third countries			Total		
			Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total
4	NATURAL SCIENCES	PhD programme												
		other doctoral programmes												
		Total												
5	ENGINEERING, METALLURGY CIVIL ENGINEERING	PhD programme												
		other doctoral programmes	22	19	41	3	3	6	2	8	10	27	30	57
		Total	22	19	41	3	3	6	2	8	10	27	30	57
		other doctoral programmes	17	14	31	3	2	5	2	5	7	22	21	43
		Total	17	14	31	3	2	5	2	5	7	22	21	43
58	Architecture and civil engineering	PhD programme												
		other doctoral programmes	5	5	10		1	1		3	3	5	9	14
		Total	5	5	10		1	1		3	3	5	9	14
6	AGRICULTURAL SCIENCES	PhD programme												
		other doctorate programmes	12	13	25	1	1	2	4	9	13	17	23	40
		Total	12	13	25	1	1	2	4	9	13	17	23	40
62	AGRICULTURAL SCIENCES, Forestry and fisheries and allied sciences	PhD programme												
		other doctoral programmes	12	13	25	1	1	2	4	9	13	17	23	40
		Total	12	13	25	1	1	2	4	9	13	17	23	40
Total		PhD programme												
		other doctoral programmes	34	32	66	4	4	8	6	17	23	44	53	97
		Total	34	32	66	4	4	8	6	17	23	44	53	97

Table 41a

Number of doctoral degrees awarded in the academic years of 2004/05 and 2003/04 (IV.2.1)

Curriculum[1]		Type of doctoral programme	2004/05 Nationality				2003/04 Nationality			
			Austria	EU	Third countries	Total	Austria	EU	Third countries	Total
4	NATURAL SCIENCES	PhD programme								
		other doctoral programmes								
		Total								
5	ENGINEERING, METALLURGY CIVIL ENGINEERING	PhD programme								
		other doctoral programmes	41	6	10	57	45	1	6	52
		Total	41	6	10	57	45	1	6	52
	54 Metallurgy and mining	PhD programme								
		other doctoral programmes	31	5	7	43	33	–	2	35
		Total	31	5	7	43	33	–	2	35
	58 Architecture and civil engineering	PhD programme								
		other doctoral programmes	10	1	3	14	12	1	4	17
		Total	10	1	3	14	12	1	4	17
6	AGRICULTURAL SCIENCES	PhD programme								
		other doctoral programmes	25	2	13	40	30	7	5	42
		Total	25	2	13	40	30	7	5	42
	62 Agriculture, forestry and fisheries and allied sciences	PhD programme								
		other doctoral programmes	25	2	13	40	30	7	5	42
		Total	25	2	13	40	30	7	5	42
Total		PhD programme								
		other doctoral programmes	66	8	23	97	75	8	11	94
		Total	66	8	23	97	75	8	11	94

1 On level 1–2 of the ISCED classification

Table 42

Number of scientific publications of the staff in 2005 (IV.2.2)

Type of publication	2005	2004
Articles published for the first time in SCI journals (source: SCI exp./SSCI: articles in listed journals)		
Articles published for the first time in other scientific journals		
Articles published for the first time in collected editions		
Articles published for scientific congresses (proceedings)		
Other scientific publications		

Monographs	
Research reports and expert reviews	
Editorialships	

Articles published for the first time in SCI journals (source: SCI expanded/SSCI:articles according to Journal Citation Report)

Table 43

Proceeds from research and development projects according to subsection 27 (1) 3 in euro in 2004 and 2005 (IV.2.5)

Commissioning/funding organisation	Proceeds in m EURO (2005)	Proceeds in m EURO (2004)
EU	4.12	4.74
Other sponsors	17.32	16.02
Total	21.44	20.76

Proceeds from research and development projects according to subsection 26 (1) 3 in euro in 2004 and 2005 (IV.2.5)

Commissioning/funding organisation	Proceeds in m EURO (2005)	Proceeds in m EURO (2004)
FWF	4.24	3.73

Table 40
Number of degrees awarded within the minimum duration of studies in addition to one tolerance semester in the academic years of 2004/05 and 2003/04 (IV.1.4)

Curriculum[1]		Type of programme	2004/05	2003/04
4	NATURAL SCIENCES	First degrees	–	–
		Further degrees	–	–
		Total	–	–
5	ENGINEERING, METALLURGY CIVIL ENGINEERING	First degrees	25	19
		Further degrees	18	15
		Total	43	34
54	Metallurgy and mining	First degrees	16	8
		Further degrees	11	7
		Total	27	15
58	Architecture and civil engineering	First degrees	9	11
		Further degrees	7	8
		Total	16	19
6	AGRICULTURAL SCIENCES	First degrees	55	43
		Further degrees	17	14
		Total	72	57
62	Agriculture, forestry and fisheries and allied sciences	First degrees	55	43
		Further degrees	17	14
		Total	72	57
8	SERVICES	First degrees	–	–
		Further degrees	2	–
		Total	2	–
85	Environmental protection	First degrees	–	–
		Further degrees	2	–
		Total	2	–
9	Unknown/No specific data available	First degrees	6	12
		Further degrees	–	–
		Total	6	12
99	Unknown/No specific data available	First degrees	6	12
		Further degrees	–	–
		Total	6	12

	Type of academic programme (number of tolerance semesters)	2004/05	2003/04
Total	First degrees	86	74
	including diploma degrees (2)	83	74
	including bachelor's degrees(1)	3	–
	Further degrees	37	29
	including master's degrees (1)	11	7
	including doctoral degrees (1)	26	22
	Total	123	103
	including diploma degrees (2)	83	74
	including bachelor's degrees (1)	3	–
	including master's degrees (1)	11	7
	including doctoral degrees (1)	26	22

1 On level 1–2 of ISCED classification

GRI guidelines 2002 requirements of the Global Reporting Initiative

The BOKU Intellectual Capital Report 2005 was for the first time combined with a sustainability report. The Intellectual Capital Report Act of the Federal Ministry for Education, Science and Culture (BGBI. I Nr. 120) provides criteria for the generation of the intellectual capital report of the universities according to subsection 6 of the University Act 2002 and refers to all locations of the university.

The sustainability report was generated based on the "Reporting Guidelines" 2002 of the Global Reporting Initiative, in accordance with the structure of the intellectual capital report. BOKU's sustainability report pertains to the optional performance report. Data included refer to the entire university.

Only listed indicators and the interpretation of the section "ecological performance indicators" are based on the EMAS certificate and only valid for the locations Türkenschanze and Muthgasse, however not yet for IFA Tulln.

The following table provides an overview of all GRI topics and key indicators and their reference in this report. GRI guidelines were generated for and by corporations, thus not all guidelines apply to a research and educational institution such as BOKU. The following table indicates where BOKU was unable to provide data.

■ fully reported – behandelt ▨ partially reported (teilweise behandelt) □ not reported (nicht behandelt, nicht relevant)

topic according to GRI		starting on page	in the report (chapter)	Notes
1. Vision and strategy				
1.1	■ Vision, strategy	14	Vision, Mission und Kompetenzprofil – die strategische Ausrichtung der BOKU	
		40	Ziele mit Verantwortung – die strategischen Wissensziele der BOKU	
		18	Das Konzept „Responsible University"	
1.2	■ Statement of rectorate and university council	6	Die BOKU als „Nachhaltige Universität" (Vorwort Universitätsrat)	
		10	Wissen mit Verantwortung (Vorwort Rektorat)	
2. Profile				
2.1-2.9	■ Organisational profile	20	Über die Universität des Lebens Organisation (20), Organisationsplan (21), Standorte (23)	2.9 on BOKU homepage and research database available
2.10-2.22	■ Report scope and profile		Berichtsabgrenzung und -profil *(im Cover-Umschlag)*	2.13.to 2.16, 2.17 and 2.19 do not apply to a university
		34	Bilanz mit System – das Wertschöpfungsmodell der BOKU,	
		182	Anforderungen laut GRI-Richtlinien 2002	
		188	Impressum	

3. Governance structure and management systems

3.1-3.8	☐ Structure and governance	20 52	Über die Universität des Lebens: Aufgaben (24), Rechnungsabschluss (25), Personal (25, 52) Nachhaltigkeit & EMAS (26), Managementsysteme (29) Intellektuelles Kapital – Humankapital	3.2. to 3.4. do not directly apply to a university, 3.8. does not apply at all
3.9-3.12	■ Stakeholder engagement	40 74 82 128 190	Kommunikation mit Stakeholdern Intellektuelles Kapital – Beziehungskapital Round Table Gespräch mit Stakeholdern Ideen mit Substanz – Ergebnisse für gesellschaftliche und wirtschaftliche Entwicklung Output und Wirkungen der Kernprozesse – Forschung & Entwicklung (132), Gesellschaftliche und wirtschaftliche Entwicklung (138) Einladung zum Dialog	
3.13-3.20	☐ Overarching policies and management sytems	20 74 186	Über die Universität des Lebens Meilensteine (26), „Europäische Charta für Forscher“ sowie „Verhaltenskodex für die Einstellung von Forschern“ (27) Intellektuelles Kapital – Beziehungskapital Beteiligungen, Mitgliedschaften (78), EMAS und ISO 14001 Zertifikat	

4. GRI Content Index

4.1	☐ GRI-Index	182	Anforderungen laut GRI-Richtlinien 2002	Setions of the report and indicators that are irrelevant for a university are mentioned

5. Performance indicators

Economic performance indicators

EC 1–9	☐ Customers, suppliers, employees, providers of capital, public sector	20 52	Über die Universität des Lebens Rechnungsabschluss (25), Personal (25) Intellektuelles Kapital – Humankapital	Excerpt of the BOKU report on December 31 2005, but link available for entire document
EC 10	■ Donations to community, civil society, and other groups	112	Kernprozess Gesellschaftliche und wirtschaftliche Entwicklung: Spenden für soziale Zwecke (114)	
EC 13	☐ Additional indicator: Indirect economic impacts	128 	Ideen mit Substanz – Ergebnisse für gesellschaftliche und wirtschaftliche Entwicklung Output und Wirkungen der Kernprozesse – Forschung & Entwicklung (132)	

Environmental performance indicators

EN 1–5	☐ Materials, energy and water	115	Die ökologische Verantwortung, Umweltaspekte (118)	EN2 not yet assessed
EN 6–7	☐ Biodiversity	115	Die ökologische Verantwortung	currently being developed; a central BOKU research topic of core process “research and development”, results are of value for society
EN 8–13	☐ Emissions, effluents and waste	115	Die ökologische Verantwortung, Umweltaspekte (118)	EN 8 partially, EN 9 and EN 13 not yet assessed
EN 14–15	☐ Products and services	115	Die ökologische Verantwortung	BOKU is indirectly involved (research topic) in the core process of research and provides valuable contributions to society, EN 14 has not yet been assessed; EN 15 not applicable
EN 16	■ Compliance	115	Die ökologische Verantwortung	Compliance database was generated according to EMAS. In compliance with EMAS Legal Compliance System.

Social performance indicators: Labour practices and decent work

LA 1–2	■ Employment	52	Intellektuelles Kapital – Humankapital Personalstand und -anteile (52), Ein- und Austritte (54), Nationalität (55), Personalplanung und -aufnahme (57)	
LA 3–4	▢ Labour/Management relations	20	Über die Universität des Lebens Serviceeinrichtungen (22)	ad EN 3-4: indicators not yet assessed, currently being developed
LA 5–7	▢ Health and safety	52	Intellektuelles Kapital – Humankapital Arbeitssicherheit und Gesundheitsvorsorge (60)	First indicators assessed, currently being developed
LA 8	☐ Policies or programmes on HIV/AIDS			not directly relevant for BOKU BOKU makes valuable contributions to society
LA 9	▢ Training and education	52	Intellektuelles Kapital – Humankapital Personalentwicklung (59)	Indicator can not yet be assessed at BOKU, currently being developed
LA 10–11	▢ Diversity and opportunity	20 52 63	Über die Universität des Lebens Intellektuelles Kapital – Humankapital Personalstand und -anteile (52) Intellektuelles Kapital – Strukturkapital Femalesförderung (63), Koordinationsstelle und AK für Gleichbehandlungsfragen (63), Females- und Genderforschung (66)	Indicators published based on the Intellectual Capital Report Act; currently being developed.

Social performance indicators: Human rights

HR 1–2	▢ Strategy and management	40	Kommunikation mit Stakeholdern Research for Development Forum (49), EMAS Umwelterklärung *(im Cover-Umschlag)*	Currently being developed
HR 4	▢ Non-discrimination	20 63	Über die Universität des Lebens Europäische Charta für Forscher“ sowie „Verhaltenskodex für die Einstellung von Forschern“ (27), Managementsysteme (29) Intellektuelles Kapital – Strukturkapital Koordinationsstelle und AK für Gleichbehandlungsfragen (63)	First steps completed, further developed
HR 5	☐ Freedom of association and collective bargaining			is legally binding in Austria, currently being developed
HR 6	☐ Child labour			not directly relevant for BOKU, could become relevant in the context of partnerships with developing countries in “on-site projects”
HR 7	☐ Forced and compulsory labour			Irrelevant for BOKU
SO 1	■ Community	88	Leistungen für Menschen – Die Kernprozesse der „Responsible University“ Kernprozess Gesellschaftliche und wirtschaftliche Entwicklung (112)	Does not apply for BOKU locations of Vienna and Tulln; BOKU makes a valueable contribution to all public authorities with their research activities
SO 2	☐ Bribery and corruption			Currently irrelavant for BOKU, not yet assessed
SO 3	▢ Political contributions	88	Leistungen für Menschen – Die Kernprozesse der „Responsible University“ Kernprozess Gesellschaftliche und wirtschaftliche Entwicklung (112)	BOKU makes valuable contributions to support politicans on a federal and local level (political consultations); currently being developed

Gesellschaftliche / soziale Leistungsindikatoren: Produktverantwortung

PR 1–3	☐ Product responsibility			not yet included; currently being developed

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Validation certificate for validated environmental data

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Invitation to a dialogue with stakeholders

Vienna, September 2006

Dear partners of the University of Natural Resources and Applied Life Sciences Vienna,
Dear Colleagues,

You are reviewing the intellectual capital report 2005 “Responsibility for Sustainability” of the “Responsible University” BOKU. Our second intellectual capital report was supplemented by the sustainability report according to the Global Initiative as a result of successful EMAS certification in spring 2006. Thus, BOKU does not only report about the core process of “education and continued education”, research and development”, as well as “societal and economic development”, but also about social and ecological responsibility. The latter is included in our environmental declaration that was certified by Lloyd’s Register Quality Assurance.

BOKU aims at developing further the intellectual capital report and the pertaining sustainability report together with stakeholders, staff and students. I would like to extend the invitation to you to join us and welcome your feedback.

Questions, comments and feedback may be directed to BOKU’s Research Support Office (horst.mayr@boku.ac.at).

Sincerely,

Martin Gerzabek
Vice-Rector for Research

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