Contact information

Göran Finnveden
Vice-President for Sustainable Development
KTH Royal Institute of Technology
Drottning Kristinas väg 30
100 44 Stockholm
Sweden
goranfi@kth.se
+46-8-790 73 18

Johan Sundqvist
Environmental Manager
KTH Royal Institute of Technology
Osquldas väg 6
100 44 Stockholm
Sweden
johsund@kth.se
+46-8-790 72 88
Table of contents

Introduction ................................................................................................................................................... 4

About KTH.................................................................................................................................................. 5

On this report........................................................................................................................................... 6

Principle 1 – Sustainability Performance of Buildings on Campus .......................................................... 7

Management approach to principle 1 ....................................................................................................... 7

Table 1 – Overview of goals related to Principle 1 ................................................................................. 9

Principle 2 – Campus-wide Master Planning and Target Setting ............................................................ 10

Management approach to principle 2 .................................................................................................. 10

Table 2 – Overview of goals related to Principle 2 ............................................................................. 11

Principle 3 – Integration of Facilities, Research and Education ................................................................. 13

Management approach to principle 3 .................................................................................................. 13

Table 3 – Overview of goals related to Principle 3 ............................................................................. 15

Appendix 1 – KTH’s Policy for Sustainable Development ..................................................................... 18
Introduction

KTH contributes to sustainable development by providing educational programmes, conducting research and by interacting with the surrounding community. As a result of its operations, KTH impacts on the environment through the production of waste, the use of materials and the use of water, energy and chemicals, through its staff travelling and by using transport services and also through construction work; and indirectly through purchasing and procurement.

KTH’s Strategic Plan 2009-2012 states:

"The most important global challenges today are to create sustainable development and to solve the climate issue. Consequently strong environmental awareness must be part of the KTH identity and must be reflected in an orientation towards the environment and energy in KTH education and research. Important education and research issues will concern people’s health and quality of life. In order to realise this vision the social dimension of the concept sustainable development must also be strongly emphasised in operations and characterise not only the organisation and the education it provides, but also decisions taken on a day-to-day basis."

The area is of great importance to KTH which is also demonstrated in the values formulated as follows:

"KTH’s operations are based on the conviction that education and research can, and should, contribute to improved living conditions and to peaceful social development that fulfils relevant requirements as concerns ecological, social and economic sustainability. As a technical university, KTH bears special responsibility for the development of the knowledge necessary to promote such sustainable development."

One of KTH’s overall objectives in the development plan to be achieved by 2012 includes:

"KTH considers, in all its operations, sustainable development from an ecological, economic, social and technical point of view."

In 2011, KTH has formulated several new initiatives in the field of the Environment and Sustainable Development. The overall objective is that KTH will become one of Europe’s leading technical universities within this area. KTH has chosen to divide the strategic and practical work into two areas: KTH-Sustainability and Sustainable Campus where KTH-Sustainability is responsible for teaching, research and co-operation; and where Sustainable Campus is responsible for the university’s internal environmental management. It is important that these two areas move forward together at the same pace. This is so that the environmental management system will also include the indirect environmental effects of teaching, research and collaboration. As a part of the drive, a Vice-President with responsibility for sustainable development and an Environmental Manager were appointed in 2011.

KTH also has laws and regulations that relate to the environment and sustainability, two examples are;

The Higher Education Act, Chapter l, § 5

On the 1 February 2006 the Higher Education Act, Chapter l, § 5 was amended to include the passage: “Higher education institutions shall function to promote sustainable development so that present and future generations are assured a healthy and sound environment, economic and social welfare and justice.”

Ordinance (2009:907) on environmental management in government authorities, § 3

“An authority listed in Annex 1 shall, within the framework of their regular assignments, have an environmental management system that integrates environmental considerations into the authority’s activities so that it takes
into account the operations’ direct and indirect environmental impacts in a systematic way. An authority whose activities result in a significant environmental impact should be registered in accordance with the European Parliament and the Council’s regulation (EC) No. 761/2001 of 19 March 2001 (EMAS) or must be certified in accordance with the ISO 14001 standard.”

It is estimated that the introduction of quality-assured environmental work carried out in accordance with ISO 14001 at KTH would have several positive consequences for the university’s operations:

• It will support KTH’s environmental efforts, which in turn will create a better environment and thereby a better quality of life for its students, employees and other stakeholders.

• A potential for cost efficiencies will be given consideration which also means that the resources available within operations are better managed.

• KTH’s “brand” will be strengthened and consequently its competitiveness.

The control of environmental work, shall in accordance with legislation, be carried out through the introduction and continuous development of an EMS (System for Environmental Management). This should be carried out according to the international standard ISO 14001 for environmental management, which facilitates the work and provides a structured, efficient and systematic approach for dealing with environmental issues. With an EMS, KTH can organize its environmental activities in an efficient manner.

The President has decided that the EMS should be ready for certification no later than 31 December 2014.

About KTH

KTH is responsible for one third of Sweden’s capacity for technical research and is the country’s largest organiser of technical/engineering education at university level. KTH education and research covers a broad spectrum – from natural sciences to all branches of engineering plus other areas such as architecture, industrial economics, urban planning, work science, philosophy and the history of technology. In addition to the research at KTH schools there are a large number of national and local competence centres located at KTH, as well as research programmes financed by various research foundations.

KTH offers degree courses in architecture, master of science in engineering, bachelor of science in engineering, bachelor’s degree, master’s degrees (one or two years), licentiate and doctoral degrees. There is also a technical preparatory course as well as further education. There are a total of 13,300 full year students at first (undergraduate) level and second (postgraduate) level, 30% of whom are women, over 1,700 active research students and a little over 4,600 employees.

KTH is an international university with many international researchers and students, especially at Master’s level. Extensive international research and educational exchange programmes allow for exchange with universities and colleges in Europe, the U.S. and Australia, but also increasingly in Asia. KTH is a partner in several international university networks such as CLUSTER and T.I.M.E.

Several national research centres are hosted by KTH. KTH is also a major partner in two out of three European Knowledge and Innovation Communities formed by the prestigious EU organization EIT (European Institute of Innovation and Technology); InnoEnergy within the field sustainable energy and EIT ICT Labs within information and communication research. Five strategic multidisciplinary research platforms have been formed to further enhance KTH’s attraction as a major strategic research partner.
KTH was founded in 1827 and the main campus is located in attractive, and now listed, buildings in central Stockholm since 1917. In addition, KTH and Stockholm University jointly offer study programmes and carry out research in biotechnology and physics at nearby AlbaNova University Center. The School of Information and Communication Technology is located on the Kista campus, in the northern part of Stockholm, and there are additional campuses located in Haninge, Flemingsberg and Södertälje in the southern metropolitan area.

KTH is organised into schools. The schools are responsible for the relevant departments, centres and educational programmes. Schools report directly to the President and are headed by a Dean and a Vice-Dean. The President leads operations reporting to the University Board. One Vice President acts as the President’s Deputy. The President’s Group deals with strategic educational, research and quality issues and consists of the President, Deputy President, Dean of Faculty, Vice-Dean of Faculty, vice-president for research, the University Director and a student representative. The KTH Management Group deals with matters concerning all KTH schools and consists of the President, Deputy President, Dean of Faculty, Vice-Dean of Faculty, Vice-Presidents, University Director, all deans of schools and two student representatives.

The Faculty Council bears the academic responsibility for KTH’s education and research. Quality activities – follow-up, evaluation and recommendations – have a prominent place in their operations.

A central Faculty Forum acts as an arena for information, discussion and introduction of overall policy issues, as well as providing advice on research and educational matters. The University Board supervises all KTH operations and is responsible for ensuring that tasks are properly fulfilled. The Board consists of 15 members – eight external representatives, the President, three teachers and three student representatives.

In 2011, KTH’s total revenues amounted to SEK 3,713 million of which 28% was funding for educational programmes at undergraduate and graduate level, 25% were grants for research and doctoral programmes and the remaining 47% was external funding from, among other things, research foundations and the EU.

On this report

Since October 2010, KTH has been a member of the International Sustainable Campus Network. This report is the first of its kind for KTH and covers the years 2010-2011. It is by no means exhaustive and further work on those areas that are lacking will be carried out. The report was compiled by Teresia Sandberg, Project Coordinator at KTH-Sustainability, and Leif Svanblom, Environmental Controller. The information and data presented here have been taken from the Annual Report 2011, KTH’s Strategic Plan 2009-2012, the Project Plan for KTH-Sustainability and KTH’s environmental review 2011.
## Principle 1 – Sustainability Performance of Buildings on Campus

**Principle 1:** To demonstrate respect for nature and society, sustainability considerations should be an integral part of planning, construction, renovation, and operation of buildings on campus.

A sustainable campus infrastructure is governed by respect for natural resources and social responsibility, and embraces the principle of a low carbon economy. Concrete goals embodied in individual buildings can include minimizing environmental impacts (such as energy and water consumption or waste), furthering equal access (such as nondiscrimination of the disabled), and optimizing the integration of the built and natural environments. To ensure buildings on campus can meet these goals in the long term, and in a flexible manner, useful processes include participatory planning (integrating end-users such as faculty, staff, and students) and life-cycle costing (taking into account future cost-savings from sustainable construction).

### Management Approach to Principle 1

In March 2010 the President appointed a working group whose assignment was to conduct an extensive survey of KTH's environmental work. The assignment also included an evaluation of KTH's performance in relation to established environmental goals, but also in relation to other universities. One consequence of the working group’s report was a strengthening of KTH's environmental organization to include a Vice-President for Sustainable Development and an Environmental Manager. In December 2010, the University Board decided to adopt a new environmental policy (see Appendix 1) and also to instruct the President to decide on staffing and resources for the implementation of an environmental policy and an action plan. In September 2011, the President decided that KTH would become environmentally certified to ISO 14001 standard throughout its entire operations. The certification process has begun with an environmental review conducted by an independent consultant. The environmental review was completed in December 2011. Based on this review, an environmental aspect assessment will be carried out which will form the basis of an appraisal of the policy and the preparation of an action plan.

KTH's operations are conducted in rented premises and the largest landlord is Akademiska Hus. The Environment and Building department at KTH's University Administration is responsible for issues related to the provision of premises. If there is a need for new construction and/or the renovation of premises, representatives for the tenant, i.e. KTH’s schools or equivalent, together with the Environment and Building department will participate in the planning and design process which is conducted by the property owner, primarily Akademiska Hus. Akademiska Hus has ambitious environmental goals, including 40% in energy savings by 2025, starting from the year 2000. They are also members and promoters of Sweden Green Building Council.

To coordinate the requirements that KTH makes on their premises in various projects, the Environment and Building department with the help of hired specialist consultants have put together planning documentation. This includes, for example, health and environment considerations and is sanctioned by the department head.

KTH has premises in seven locations with 42 buildings and an area of 240,000 m². KTH Campus is the area with the largest area and the most buildings, 170,000 m² or 29 buildings.
One of the goals of the KTH Strategic Plan 2009-2012 relates to infrastructure and campus work:

“A Strategic Plan for the physical environment has been established with a special focus on integrated, sustainable campus environments.”

Since 2009, there is a regulation which is aimed at increasing energy efficiency in Swedish authorities. Each authority will implement at least two of six predetermined measures and report back on the work that has been carried out to the Energy Agency annually. The President has decided that the two measures KTH will work with will be to purchase equipment based on energy-efficient product specifications and to change and modify equipment in favour of energy-efficient alternatives.
### Table 1 - Overview of goals related to Principle 1

<table>
<thead>
<tr>
<th>Topics</th>
<th>Goals and Initiatives</th>
<th>Key initiatives</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Priority areas</strong></td>
<td><strong>Objectives and targets</strong></td>
<td><strong>Key initiatives</strong></td>
<td><strong>Performance 2010</strong></td>
</tr>
<tr>
<td>Energy use</td>
<td>New targets are not defined. See above. Overall objective is to reduce KTH’s climate impact.</td>
<td>Together with property owners, start several energy saving projects.</td>
<td>KTH main campus:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electricity 129 kWh/m²</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>District heating 126 kWh/m²</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cooling 75 kWh/m²</td>
</tr>
<tr>
<td>Energy use</td>
<td>Purchase energy efficient equipment</td>
<td>During the procurement process, experts must be consulted to ensure that relevant environmental and energy aspects are taken into consideration.</td>
<td>No figures</td>
</tr>
<tr>
<td>Paper use</td>
<td>Reduce the use of paper at University Administration</td>
<td>All printers and copying machines will have a default function for double printing</td>
<td>No figures</td>
</tr>
<tr>
<td>Waste</td>
<td>Increase in recycling</td>
<td>Every lunch-room at University Administration will have recycling</td>
<td></td>
</tr>
</tbody>
</table>
During 2012 KTH’s environmental work will be further consolidated and new key initiatives and targets in this area will be formulated.
Principle 2 – Campus-wide Master Planning and Target Setting

**Principle 2: To ensure long-term sustainable campus development, campus-wide master planning and target-setting should include environmental and social goals.**

Sustainable campus development needs to rely on forward-looking planning processes that consider the campus as a whole, and not just individual buildings. These processes can include comprehensive master planning with goals for impact management (for example, limiting use of land and other natural resources and protecting ecosystems), responsible operation (for example encouraging environmentally compatible transport modes and efficiently managing urban flows), and social integration (ensuring user diversity, creating indoor and outdoor spaces for social exchange and shared learning, and supporting ease of access to commerce and services). Such integrated planning can profit from including users and neighbors, and can be strengthened by organization-wide target setting (for example greenhouse gas emission goals). Existing low-carbon lifestyles and practices within individual campuses that foster sustainability, such as easy access for pedestrians, grey water recycling and low levels of resource use and waste generation, need to be identified, expanded and disseminated widely.

Management Approach to Principle 2

KTH will educate engineers with an equality and global perspective for today's and tomorrow’s society. Approximately 30% of today's students and PhD students at KTH are women. In Sweden, the internationalization of higher education has been rapid and KTH is among the universities and university colleges with the most students of foreign origin. Approximately one hundred different nationalities are currently represented in the various KTH campuses.

The KTH Strategic Plan 2009-2012 indicates that KTH regards diversity in terms of gender, ethnicity, cultural similarities and differences as a valuable resource for both KTH and for technological development in general. There are many ways of taking advantage of the unique diversity of the staff and students at KTH today. Issues such as equality, diversity and equal treatment, and consideration to these aspects in the day to day work of a modern university are important tools that are used at present to attend to both the individual’s needs and to KTH’s needs of being able to provide the best education and workplace. An action plan is directly linked to the strategic objectives of the KTH Strategic Plan for 2010-2012.

At KTH, each person who travels is responsible for ensuring that the journey is planned and implemented so that the environmental impact and costs are minimized and that comfort and safety is achieved, and also that the journey is undertaken within a reasonable amount of time. Alternatives to travelling, such as telephone meetings or video conferencing must always be considered. When planning a meeting/conference, the meeting time must be scheduled with due consideration to those participants who are travelling by train.
<table>
<thead>
<tr>
<th>Topics</th>
<th>Goals and Initiatives</th>
<th>Key initiatives</th>
<th>Performance 2010</th>
<th>Performance 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social</strong></td>
<td>The proportion of women in the KTH faculty will increase from 15% in 2008 to 20% in 2012.</td>
<td>Training in leadership and education should include and highlight issues of gender and technology. For new appointments, people who are trained in gender equality along with appointment committees that provide equal opportunities for men and women will make proposals for candidates.</td>
<td>Female Professors 10%</td>
<td>Female Professors 11%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>The proportion of women registered on engineering courses (Undergraduate and Master’s level), architectural programmes and doctoral programmes should be at least 35% in 2012. No single educational environment has less than 10% women in 2012.</td>
<td>New activities will start to strengthen student recruitment of women at all educational levels. During the period KTH will further develop cooperation with secondary schools nationally to broaden recruitment.</td>
<td>New students at undergraduate level: 27% women</td>
<td>New students at undergraduate level: 30% women</td>
</tr>
<tr>
<td><strong>Transportation</strong></td>
<td>KTH’s ecological footprint, energy use and</td>
<td>New travel policy to be developed</td>
<td>3,054 kg CO2/full-time employee from air</td>
<td>2,254 kg CO2/full-time employee from air</td>
</tr>
<tr>
<td>contribution to greenhouse gases in the atmosphere will gradually decrease</td>
<td>during 2012</td>
<td>trips greater than 500 km</td>
<td>trips greater than 500 km</td>
<td></td>
</tr>
</tbody>
</table>

During 2012 KTH’s environmental work will be further consolidated and new key initiatives and targets in this area will be formulated.
Principle 3 – Integration of Facilities, Research and Education

**Principle 3: To align the organization’s core mission with sustainable development, facilities, research, and education should be linked to create a “living laboratory” for sustainability.**

On a sustainable campus, the built environment, operational systems, research, scholarship, and education are linked as a “living laboratory” for sustainability. Users (such as students, faculty, and staff) have access to research, teaching, and learning opportunities on connections between environmental, social, and economic issues. Campus sustainability programs have concrete goals and can bring together campus residents with external partners, such as industry, government, or organized civil society. Beyond exploring a sustainable future in general, such programs can address issues pertinent to research and higher education (such as environmental impacts of research facilities, participatory teaching, or research that transcends disciplines). Institutional commitments (such as a sustainability policy) and dedicated resources (such as a person or team in the administration focused on this task) contribute to success.

Management Approach to Principle 3

In 2011, the council KTH-Sustainability was formed to work with education, research and co-operation. KTH-Sustainability will serve in an advisory capacity to the President and in a preparatory capacity to the Faculty Council. It is headed by the Vice-President for Sustainable Development and is made up of teachers and student representatives and the Environmental Manager.

For KTH's educational programmes, two complementary approaches are used. Firstly, environmental and sustainable development have been given a high profile for several educational programmes, in particular, the Master of Science in Engineering programme *Energy and Environment* which started in 2010 and which has continued its strong development throughout 2011. There are also several Master's programmes with the environment and sustainable development as its theme.

The second approach is to ensure that all courses integrate the environment and sustainable development in their programmes so that they are in line with the overall learning objectives as described in the Higher Education Ordinance. Several initiatives were taken in 2011 in line with this work and they will continue throughout 2012. Sustainable development is a priority area for new targeted investments in 2012. Several new courses will be developed in the area, and educational development projects for the integration of the environment and sustainable development in the programmes will be started.

KTH's research and its research programmes will contribute to the sustainable development of society. This means that a long-term perspective will be adopted so that solutions in the short run do not constitute a threat to the ability of future generations to satisfy their needs. It also implies a holistic perspective where technology is seen in context and as something that is used by people.

KTH’s research on the environment and sustainable development is now underpinned by the fact that sustainable development is a priority area for targeted investments. Finding solutions to the long-term global challenges requires a long-term approach with regard to research, but also from the perspective of research. KTH will develop, disseminate and apply techniques, methods, approaches and knowledge that
take into account sustainable development. This in turn requires methods to identify and prioritize solutions and research that can promote sustainable development. KTH’s research on the environment and sustainable development will be based on the environment and sustainable development and will also be integrated into relevant areas of operation. This also includes not only research and the focus taken by the research but also KTH’s efforts in this area which must be long-term.
Table 3 - Overview of goals related to Principle 3

<table>
<thead>
<tr>
<th>Topics</th>
<th>Goals and Initiatives</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority areas</td>
<td><strong>Objectives and targets</strong></td>
<td>Key initiatives</td>
</tr>
<tr>
<td>Education</td>
<td>All educational programmes shall address the specific and general learning objectives for the environment and sustainable development</td>
<td>In 2012 all educational programmes have conducted a self-assessment of programme-specific and general learning objectives for the environment and sustainable development at both programme and course level. Self-assessments should examine in particular the extent to which exams test these learning objectives. It should also find out how course analyses are designed to investigate students' learning in these respects. Based on self-assessment, the schools shall develop an action plan for the development of KTH's educational programmes for environmental and sustainable development.</td>
</tr>
<tr>
<td>Education</td>
<td>New educational programmes must address environmental and sustainable development considerations</td>
<td>When applying for the establishment of educational programmes, those responsible must describe how they plan to include environmental and sustainable development considerations. This is done according to the checklist for the process of application and a decision on the establishment of educational programmes. KTH Sustainability should be a referral body to the Faculty Council before a decision is taken regarding establishment.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Research</td>
<td>KTH’s research relevant to environment and sustainable development has increased and is visible outwardly towards society</td>
<td>Mapping of research related to environment and sustainable development and presentation on webpage.</td>
</tr>
<tr>
<td>Research</td>
<td>Research on the environment and sustainable development has been included in the statement of operations from the schools, for</td>
<td></td>
</tr>
</tbody>
</table>
example with regard to publications, citations, external financing of research projects, quality, the direction of change and the pace of change.

| Research | Communicate KTH’s research within environment and sustainable development | KTH-Sustainability is responsible for producing a report on *Research for sustainable development at KTH* in its overall annual report regarding sustainable development work. This report will form the basis for communication and information internally and externally. | In progress |
| Co-operation | Communicate KTH’s research within environment and sustainable development | Develop a communication plan for KTH's work with the environment and sustainable development | In progress |
| Co-operation | Increase KTH's presence in the media with regard to issues that concern the environment and sustainable development | According to activities in the communication plan | In progress |

During 2012 KTH’s environmental work will be further consolidated and new key initiatives and targets in this area will be formulated.
POLICY FOR SUSTAINABLE DEVELOPMENT

KTH should actively and responsibly contribute to sustainable development through education, research and cooperation with business and the public as well as through reduction of its own ecological footprint.

- KTH should develop and strengthen its role as a university which actively and responsibly works with environmental issues and sustainable development.
- KTH’s identity and brand should be associated with sustainable development.
- KTH’s ecological footprint, energy use and contributions to greenhouse gases in the atmosphere should gradually decrease.
- KTH should be a socially attractive place of work with good work environments, have a sound economy and master problems in both its work and campus environments according to laws and good professional practice. The KTH Development Plan and the policies for work environment, gender equality and diversity among employees and for ethics should support sustainable development.
- KTH employees, students, alumni and external partners should contribute to sustainable development through research, education and cooperation. This is done by development, dissemination and implementation of such technology, methods, views and knowledge that promote sustainable development.
- KTH employees and students should, through education and research, continuously develop abilities to critically analyze different alternatives in their work or studies and select those which may promote sustainable development.
- KTH should be a place where issues concerning the environment and sustainable development are presented and debated, and where disciplines, views and stakeholders interact.
- The KTH management is in its priorities, plans and decisions, ultimately responsible for the fulfillment of the goals of the action plan. For this task, the KTH management is supported by an operative organization made up of Sustainable Campus and KTH Sustainability.
- The KTH school managements, departments, divisions, units, research groups and administrations are responsible for carrying out and applying this policy and the action plan within their operations and to prioritize this work within available resources.

To achieve policy objectives there is an action plan. In the action plan goals are set, whose fulfillment is followed up annually and presented in a report. The action plan will be revised if needed.

Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs.