

# The International Sustainable Campus Network Symposium 'Better Campus, Better City: Learning for a Sustainable Future'

Report of the ISCN Symposium held on 27 & 28 July 2010 in the Luxembourg Pavilion and at Tongji University during the World EXPO 2010, Shanghai, China



*The Chinese Dragon on Parade at the Expo*



*The Luxembourg Expo Pavilion*



*The group on Tongji Campus*

This report was compiled by Ariane König with input from Bernd Kasemir, Matt Gardner, Ying Hua, and Bojan Baletic based on interventions at the Symposium and written abstracts by all presenters.

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Last but not least, without Rolf Tarrach's invitation to me already in 2008 'to do something' about the presence of the University of Luxembourg at the World Expo Shanghai China, and the Luxembourg Pavilion, and leaving me the freedom to combine this open invitation with one of my favourite and in my eyes most worthwhile projects (and that is to contribute to the International Sustainable Campus Network) this event would never have taken place.

This report was largely compiled from abstracts of presenters (see biographies in Annex II), and short synopsis of discussions after each sessions by Bernd Kasemir, Matthew Gardner and myself.

Luxembourg, 10.10.2010,

Ariane König

## Table of Contents

<b>ACKNOWLEDGEMENTS</b> .....	<b>2</b>
<b>HIGHLIGHTS FOR POLICY- AND DECISION-MAKERS</b> .....	<b>4</b>
Recommendations for connecting sustainable campus and city development .....	4
Recommendations for the ISCN .....	5
<b>1. SETTING THE SCENE:</b> .....	<b>6</b>
<b>2. THEMATIC SESSIONS AT THE SYMPOSIUM</b> .....	<b>7</b>
2.1 Planning for sustainable campuses and cities: creating places of knowledge .....	7
2.2 Implementation: Green Buildings and Beyond .....	10
2.3 Learning: integrating facilities and outreach in research and education .....	12
2.4 Focus: Towards Low Carbon Communities.....	13
<b>3. FUTURE ORGANISATION AND WORK CONTENT OF THE ISCN</b> .....	<b>14</b>
3.1 The ISCN hosting future organization, and works streams .....	15
3.2 The ISCN Charter and Guidelines .....	16
3.3 Data network on sustainable campus principles – guidelines – solutions.....	18
3.4 The ISCN Excellence Award System .....	19
3.4.1 The ISCN Award program .....	19
3.4.2 ISCN Excellence Awards Ceremony .....	20
3.5 The ISCN Working Groups .....	21
3.5.1 Working Group 1. Buildings and their sustainability performance.....	21
3.5.2 Working Group 2: Campus-wide Planning and Target Setting.....	22
3.5.3 Working Group 3: Integration of Research, Teaching, and Facilities, .....	23
3.6 Financing ISCN.....	25
<b>4. CONCLUSIONS AND NEXT STEPS</b> .....	<b>25</b>
APPENDIX I: PARTICIPANTS .....	26
APPENDIX II: SHANGHAI FOLLOW-UP ISCN BOOK PROJECT .....	28
CONTACTS .....	30

## Highlights for policy- and decision-makers



New green wings for Shanghai's outskirts

In facing uncertainties from effects of ever accelerating globalization, urbanization, technological and environmental change, campuses can serve as living laboratories for cities. By demonstration and transfer new technologies and best behavioral practices, they can inspire cities in their quest to copy with new demands on societies and infrastructures, whilst attending to needs of future generations. Below are 10 recommendations from the Shanghai ISCN Symposium for leaders and change agents working in universities or governments.

### Recommendations for connecting sustainable campus and city development

1. Design for exchange: Exchange between campus and city requires permeable boundaries between them, that is pro-actively connected infrastructure and social networks. A prerequisite for exchange in practice are socially robust boundary design processes which engage representatives of the University and city communities, as well as planners and engineers.
2. Governance for exchange: local and regional policies for environmental conservation, renovation, and economic revitalisation jointly initiated by Universities in Japan have been found to work well if they rely on formalised Town-Gown Partnerships that are based on legal agreements and involve annual reporting. Ideal projects combine environmental conservation, social integration and special planning considerations. Successful examples include projects promoting low carbon mobility, gardening in the city, and the establishment of green businesses helping social inclusion of socially disadvantaged.
3. Develop infrastructures that teach: The best building technology fails without user awareness. Eye-catching demonstration projects of environmental technologies or monitoring efforts, can be combined with other awareness raising design measures to foster behavioural change at the individual and institutional level. Examples include visible solar panels, monitoring screens reflecting improvement or worsening of energy use in individual buildings, whole organisation earth day celebrations, visible recycling, and teaching tools on best practice of individual students. Development of such projects can help to integrate improving operations and academic programmes.
4. Combine experiential learning with civic engagement projects: such projects can address local issues or emergency help in disaster areas. For example, Hong Kong University developed student projects to help restructuring in Haïti.
5. Empower students to act as change agents on and beyond campus: students at the conference requested visible and accessible offices and funds to realize campus sustainability projects. Information on campus infrastructure and operations should be accessible to students. A teaching tool with key concepts for sustainable campus development and travel grants for students to attend ISCN conferences are desirable. They also recommended university management to explore what it takes to establish student run sustainability audits of Universities – and to make available a tool kit.

## Recommendations for the ISCN

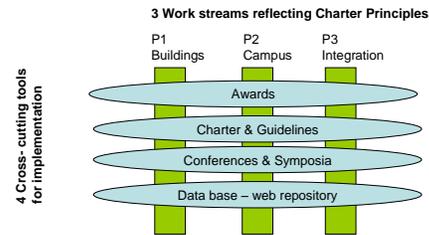


Figure 1. First ideas on future organisation of the ISCN

6. Open up the ISCN charter signature process and more widely advertise the ISCN awards programme: The ISCN has as main goal to foster exchange on sustainable development on and beyond campuses. Towards this goal it has developed a charter in conjunction with the Global University Leadership Forum linked to the World Economic Forum in Davos.<sup>1</sup> The Charter provides a priority-setting tool that fosters organisational commitment and resource allocation, which allows flexible pro-active planning of a sustainable development trajectory. Furthermore, it provides access to a network for exchange between leading Universities for exchange, learning and benchmarking. Signatories gain international visibility in an area that will increasingly play a role in rating of Universities by students and job seekers alike - globally. If your organization is interested in joining the ISCN-GULF Charter, please contact the ISCN Secretariat (see Contacts at the end of this report). In addition, the ISCN awards programme was designed to improve visibility of best practice and provide an incentive for it. Participants at the Symposium requested to open up the Charter process and to more widely advertise the Awards system.

7. The ISCN data base for sustainable campus design solutions should be made applicable for cities: the third of the ISCN information exchange tool apart from the Charter and the awards system is a design data base that is being developed by the University of Zagreb. This data base was found suitable at the Symposium for use in a partner network that is just being established: the league of cities for sustainable development. It was also suggested to develop an expertise data base on diverse sustainable infrastructure aspects for use in conjunction with the data base.

8. Join one of three ISCN Working Groups: ISCN's three Working Groups will be organised to co-ordinate research and information exchange amongst members such that each addresses one of three themes (buildings and renovation, campus design and operation, integration of facilities, research, education and civic engagement) corresponding to the Charter principles. Their work will include projects to further explore implications of the above five recommendations on linking sustainable campus and city development in diverse regional settings. To ensure greater impact, connections should be pro-actively forged to super campus projects such as Paris-Saclay, or projects with large dimensions in the middle East and China.

9. Symposium participants recommended establishing ISCN projects addressing overarching issues such as potential trade-offs between sustainability and excellence in research and education: An ISCN fund for research on overarching questions will be established that will as first project fund research on the following: Depending on definitions of excellence, which can change along with social norms over time, there may be trade-offs between organising higher education for sustainability or for excellence. The ISCN will conduct research on instances in which such trade-offs may exist and how they might be reconciled. If your organization is interested in joining this effort with kind and/or financial contributions, please contact the ISCN Secretariat (see Contacts at the end of this report).

10. Symposium participants requested more ISCN student exchange opportunities: several universities voiced interest in establishing funds for student exchange programmes, for example to conduct summer research projects during internships. Student travel funds to support attendance of ISCN conferences and Symposia would also be welcome.

<sup>1</sup> At the 2010 WEF meeting in Davos 21 leading Universities signed the ISCN Charter including Harvard, Yale, ETH Zürich, Ecole Polytechnique de Lausanne, the Universities of Cambridge and Oxford and INSEAD, Tsinghua, National University of Singapore and Australia National University.

# 1. Setting the scene:

## Expanding ISCN into Asia at the 2010 World Expo

The International Sustainable Campus Network (ISCN) was founded on the premise that universities have a pivotal role to play in fostering development of more sustainable technologies and practices, through research, education and civic engagement. Sustainable campuses can be conceived as 'living laboratories' for development of improved infrastructure to which the campus community can better relate, and campus communities could aim to be engaged in fostering required societal change. Key to this premise is the effective connection between Campuses and Cities considering development of networks and infrastructures for knowledge exchange, the Symposium's key focus. The 2010 World Expo in Shanghai with the theme 'Better City, Better Life' presented a uniquely suitable platform for the 2010 ISCN Symposium 'Better Campus, Better City'. Not only was it a perfect thematic connection but the World Expo also served as a door to further extend the this international platform's reach into Asia, in order to bring together new perspectives and better connect key actors. The setting in China, and in particular Shanghai distinctly underlined the salience of both the Expo and the Symposium focus.

The symposium was co-organised by the University of Luxembourg, and hosted by the Luxembourg government in the Luxembourg Pavilion, and by Tongji University, which provided its campus as a venue for the second day, and the International Sustainable Campus Network (ISCN). The Pavilion's management team and the Luxembourg Fonds National de la Recherche also provided substantial support. Over 80 participants from Asia, North and South America, Australia, North Africa and Europe – scientists and administrators of well-known international universities, urban planners, building engineers, and officials from the Chinese Ministries for construction and higher education seized this opportunity to co-mingle and exchange. Thanks to Tongji's active engagement over half of the participants came from Asia: China, Korea and Japan. Twenty five presenters shared their research, experiences and ideas. Particularly rich insights also on societal needs for sustainable development came from Prof. Naomichi Kurata, and his team from the Japanese Sustainable Campus Planning Committee of the Architectural Institute of Japan.

After words of welcome by the heads of the three organising institutions, including Prof. Rolf Tarrach, Rector of the University of Luxembourg and an overview on the symposium by the lead-organiser Dr Ariane König, the General Planner of the Expo 2010 and Dean at Tongji University, Prof. Zhiqiang Siegfried Wu, opened the symposium with a keynote speech, highlighting the links between the objectives of the symposium and the objectives of the Shanghai Expo. The challenges of China for sustainable development in a country of now nearly 1.5 Billion strong who increasingly pour into cities. This is accompanied by a racing growth of the GDP per capita with proportionally rising energy consumption. Prof. Wu emphasized that only thanks to the close co-operation of universities and regional governments in urban planning some promising solutions seem within reach. For example, China is planning eight cities with model character, the energy for which shall within a short time frame be provided entirely from renewable sources, notably the wind, the earth, and the sun.

The remainder of this document provides a more detailed account of presentations and discussions at the symposium. The next Section 2. summarises the four thematic sessions largely based on the abstracts of the presenters: 'Planning for sustainable campuses and cities: creating places of knowledge'; 'Implementation: Green Buildings and Beyond'; 'Learning: Integrating facilities and outreach in research and education'; and ending with a 'Focus: Towards low carbon communities.

Not only was the salience of the thematic content of the Symposium enhanced by its setting during the World Expo, the Symposium also took place at a turning point in the ISCN's evolution. Since 21 Universities of the Global University Leadership Forum signed the ISCN-GULF Charter in January 2010, and committed to the Charter's principles and reporting mechanism, and the successful second round of the ISCN awards system, the momentum gained provided an opportunity to re think the ISCN's structure and work content in order to better build on these past year's achievements and set a new direction for future developments. Section 3 of this report thus describes outcomes of deliberations throughout the Shanghai gathering on the reorganization of the ISCN structure and the redefinition the work content at this strategically key moment, as well as a new scheme for the organisation's longer term funding.

## 2. Thematic sessions at the Symposium

The four thematic sessions were introduced with a historical perspective on World Expos and the theme of Sustainability by Dr. Bojan Baletic and Rene Lisac from the University of Zagreb.<sup>2</sup> The presentation explored how the organisation of Expos may have impacted the development of the hosting city thereafter.

Since their inception over 150 years ago World Expositions have in most cases significantly influenced the development of the hosting cities. Selected themes and presented exhibits have always tried (more or less successfully) to inform and influence global trends. The starting point for the research was a hypothetical scenario for the World EXPO in Zagreb. Based on the analysis of the architectural program of former Expos the research addressed the following questions: What are optimal Expo models and their possible benefits for the city? What influences can World EXPO have on the city, and what are potential modes and mechanisms for this? How might the prior history of Expos have influenced the choice of and organisation in hosting cities?

Sustainability appeared in the late 1950's as a theme of ecology. During the oil crisis ecological themes became more prominent, to take center stage at the end of the 1970's as a political issue, being redefined as sustainability to comprise the Social as well as ecological aspects. Since then this concept steadily gained ground until today it has become a dominant organizing principle for the contemporary exhibitions, this trend is expected to continue in future. The concluding question of the presentation was to invite participants to ponder similarities and differences between the role university campuses and Expo grounds can play in urban sustainable development, role models for the cities and sustainable educators for the society as a whole?

### 2.1 Planning for sustainable campuses and cities: creating places of knowledge

This first thematic session of the Symposium was concerned with planning. Questions explored included 'How can master planning for sustainability optimally structure the interfaces between buildings and users, different buildings on campus, and campus and the surrounding communities? And 'How can it affect regional development?'

Kerstin Höger, from the Norwegian University of Science and Technology presented on **Sustainable Campus Masterplanning and Development**. According to Höger, the changing relationship between city and the campus – both academic and corporate – provides opportunities for fostering sustainable urban futures. Worldwide, universities and their host cities are evolving into knowledge cities. Universities and corporations thereby not only take on a central role for the sustainable cultural, economical and social development of the urban space, they are also establishing themselves as role models and laboratories for a new culture based on sustainability, creativity and innovation.

The design, masterplanning and development of sustainable campus environments demands a long-term and holistic perspective based on following principles: campuses of tomorrow should be dense, functional, open, diverse, and to a larger extent based on public transportation. This requires, among other factors, more dense development that makes it easier to choose environmentally friendly and health-enhancing mobility modes like bicycling or walking. Valuable green structures, bio-diversity and cultural heritage should also be unconditionally safeguarded. New campus development should primarily take place within the existing campus building-zones, by transformation and infill, rather than utilisation of natural areas. Implementing these principles will reduce the consumption of energy and emission of greenhouse gases from our campuses and cities.

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<sup>2</sup> The presentation is based on the result of a research undertaken by Rene Lisac, Tatjana Jaklenc, Kristina Careva and Kata Marunica at the Faculty of Architecture Ph.D.program.

Based on outstanding campus master planning projects like Science City ETH Zürich, Uithof Campus of the University of Utrecht, Science City Copenhagen, Harvard Cambridge and Allston Campus, Novartis Campus Basel, and the new Campus for the Singapore University of Technology and Design, urban design and planning factors are derived that help to create thriving science quarters. Furthermore, these factors were identified as vital in determining the sustainability of campus developments. These factors include efficient land-use; natural light and ventilation; water infiltration, green gardens and facades; long-term transformation strategies; integration into the urban context; a permeable public space network, accessibility and mobility; social cohesion; traces and identity; spatial and functional density; fostering quality of learning, teaching and research by designing spaces for formal and informal exchange, new project-oriented and artistic learning and working spaces; quality of academic and student life on campus at all hours; complementing uses and accommodations; partnerships with society and business; mixed-use building typologies; flexibility for the future; and participatory planning processes.

Building on these aspects of sustainable campus development, Naomichi Kurata representing the Sustainable Campus Planning Committee of the Architectural Institute of Japan presented on **Campus planning for promoting regional quality of life**. For the Institute, objectives for sustainable campus initiatives include not only to develop the university campus for lessening burdens on the global environment, but also to contribute to improvement of sustainability in our society by making best use of various resources of the university. The Campus Planning Committee of Architectural Institute of Japan has been discussing campus planning and town-gown partnerships from the view points of campus master planning to achieve sustainable campus, campus as a base for improving the sustainable community and region, and integral planning efforts between university and its neighboring communities and region. With these concerns, we are carrying on the studies on the methods for improving sustainability and quality of life of the community as a whole by linking campus planning closely with planning of the neighboring communities and with community development efforts associated with the university campus. The university campus is considered as an experimental and practicing field for this theme.

One aim of associated research is to explore the development of a comprehensive 'quality of life' indicator for life on campus and in the community as an indicator of livability that could result from sustainable community planning efforts. This indicator could help demonstrate the new physical framework of the sustainable community and their management methods, considering university campus as a scale model of urban communities. While improving the quality of life for students, faculty members and staff on campus, the research aims to develop the planning and management methodology for improving the sustainability of surrounding communities as well as university campus itself.

In parallel to this research, the Japanese Ministry of Education and Science has just set up the guidelines for the campus master plan focusing on the aspects of safety, sustainability and strategy. This could be the minimum standard for campus planning of public universities in Japan. Lessons were drawn from international case studies of campus planning and town-gown partnerships in the United States and Europe. Further questions shall be raised now by introducing several practice/trial cases in Japan. Some master planning efforts for sustainable campus and communities initiated by universities are Nagoya University Campus Master Plan with action programs, master planning for new campus of Kyusyu University linking to the neighboring community, and master planning of Hokkaido University associating with the existing surrounding neighborhoods. Examples of Town-Gown partnerships in Japan include the International Campus Town Initiative in Kashiwa City, the Creative City and Consortium of Universities in Yokohama City, and the Environmental Model City in Kita-Kyusyu City. Through these cases, the aim is to identify some significant implications to promote regional quality of life.

The planning of the University of Luxembourg's new campus in Esch-Belval in the South of Luxembourg on industrial waste land left by the steel producer Arcelor Mittal, was a decision also motivated by the wish to foster new regional development in the former steel production centre. This case study was developed by Xavier Poos, representative of the city of Esch, and Tom Becker and Markus Hesse from the University of Luxembourg. Xavier Poos' presentation on **'The University of Luxembourg, Challenges and Opportunities for Development of the City of Esch-sur-Alzette**, highlighted the potential of the project to create an innovative community focusing on new projects in science and business.

The Belval plans demonstrate intentions for sustainable campus development: Attention was paid to its unique sustainable urbanism with public buildings that have a mix of different functions and its construction of energy efficient buildings and eco-friendly buildings. Also helpful will be the concept of modal-split transport 40/60, prioritizing public transport, energy efficient transportation and cycling. Furthermore, it positions itself as a new centre of competences in health and eco –technologies and life sciences, sectors which are highly supported by the Government , in order to link economic development with environmental sustainability. The program seeks to promote the use of eco-technologies throughout the economy and increase Luxembourg’s production of eco-technology products and services. The government is investing 1 billion Euro in the project.

In sum, Belval will provide a new home for the University of Luxembourg; Public Research Centers and incubators for start up companies; Central Business & residential District - “Square Mile” featuring modern office space and a residential area ; Residential area – several types of housing including schooling facilities, Leisure – shopping, concert and sporting facilities. This melting pot of financial-educational-research & social activities will create new synergies which will contribute to the sustainable development of the entire campus and as a direct consequence to the entire city and even the entire region. This contribution to sustainable development is and will remain one of the main priorities of the city of Esch-sur-Alzette today and in the coming years.

Tom Becker and Markus Hesse are currently preparing research for ‘**Exploring a campus in terms of urban integration and regional development**’ once the Belval site is constructed and ready to receive the research organisations after 2013. The Luxembourg team however cautions that comparable experiences such as the promotion of the “new technologies” in the 1980s, of “innovation” in the 1990s and, more recently, of “creativity” led to rather disillusioning results. Thus we ought to explore whether “knowledge” really can be considered as a generator of wealth and economic competitiveness. Over the years, a considerable number of urban and regional studies were – and still are – being carried out in order to find the secrets behind success-stories like Silicon Valley in Northern California or the Route 128 in Boston, Massachusetts, in order to determine the local and/or regional impact of technological change. The idea behind such studies is to develop blueprint- ideas that allow us to implement such good or best practices in any other region that would like to follow a similar path. However, is it really that simple to assess and repeatedly copy such cases and become knowledge-based? Reality tends to be more complex and contingent than conventional wisdom makes us believe. Despite the obvious significance of science, research and knowledge in general, we must be cautious and take into account the limits of such blueprint thinking. The only confirmed issue seems to be the absence of a causal link between *Institution – Place – Policy – Outcome*.

Given this more cautious attitude towards “knowledge” as a generator of wealth and economic competitiveness, the team discussed the possible expectations in terms of regional development that might result from the implantation of the Cité des Sciences. Two types of effects were highlighted: direct, place-based impacts that originate from the fact that considerable investments are made available; and indirect, growth-related effects that have been targeted both by regional research and economic development policy. Yet none of these spin-off or spill-over effects should be taken for granted once the university is fully operational. Research seems to suggest that a broad interaction with other institutions and the setting up of strong networks within and beyond the region is a prerequisite for a successful regional development. Two challenges will have to be met:

One the one hand, a well-planned urban design and high quality architecture of the new campus are not enough to guarantee a successful urban integration of the project. The involvement of the users in the planning and implementation processes and their acceptance of the campus are crucial. In the case of the Cité des Sciences this acceptance is shaped by factors such as the location’s environmental qualities and amenity values, information campaigns and targeted marketing strategies, the accessibility of the new quarter as well as the socio-economic impact of the campus upon the city and the region. During the planning and implementation processes, these factors should therefore not be neglected.

On the other hand, the University of Luxembourg is aiming at further connecting the Luxembourgish case with more recent broader debates on the role of science and research as a means of urban and regional development. In this spirit the Department for Geography and Spatial Planning has taken the initiative to establish a Belval Observatory (Observatoire Belval), a virtual and material platform that

should on the one hand provide knowledge from similar cases of science cities or university towns. Then again it should trace and measure the progress of the new research campus and the way in which it is becoming reality: in terms of campus life, integration into the urban area, governance and regional impact. Such a two-way exchange may lay the ground for regional development that contributes to bringing the Cité des Sciences forward as a successful case of situating knowledge in Luxembourg.

**In the Symposium discussion** it was stressed that in addition to physical aspects also non-physical aspects of planning for campus sustainability are essential. This includes town-gown partnerships with surrounding communities. Here it is important that the university side is seen as open and responsive to community needs, rather than being seen as driving town-gown dialogues just to further their own agenda. Experiences of network members concerning openness to and interest in such partnerships by surrounding communities were generally positive, including in Asia where such collaborations are increasingly mandated from city or regional/national governments.

Concerning the question which size or density might be most appropriate for a sustainable campus, participants felt that this is very much context specific with experiences in Asia with huge new campus developments presenting different perspectives compared to more limited campus development projects in Europe or America. Here it was also mentioned that a platform for sharing experiences on campus sustainability across Asia is currently missing, and that Asian participation and inter-Asian networking within the ISCN could fulfill an important function here.

A final point of discussion was how sustainable building standards such as LEED, BREAM, Minergie etc. could better be extended to include a holistic campus perspective rather than a focus on individual buildings, providing a logical transition to the next session's topic – green buildings and beyond.

## 2.2 Implementation: Green Buildings and Beyond

This session was more focused on implementation of concrete environmentally friendly design measures during planning, construction, renovation and operation of buildings.

Hongwei Tan from Tongji University provided an overview on **Green building solutions and sustainable campus development in China**. Tongji University has been taking the lead in China in building a sustainable campus since 2003, and getting consensus through the participation of faculty, students and staff on sustainable development. The solution has been approached through technology, management and education, and with participation of all stakeholders at every stage of the process. The campus has been built up as the demonstration model of the sustainable campus nationwide. Various projects have been running on campus including a solar thermal system, wastewater reuse, heat recovery, building design for energy-efficiency, a ground source heat pump system, energy-efficiency lighting, facilities energy monitoring and a management system. This pool of new technologies and experience also served well in planning the Expo and Shanghai, including new solutions for the ecological recycling of river water or for achieving greater comfort in a city environment through spraying of water mists. The campus energy management system has been promoted in China. It could be contributed to sustainable campus and society.

Furthermore, a series of sustainable development curricula for undergraduates and graduates have been created. The students have participated in the sustainable campus initiative, which could make a valuable contribution to sustainable development at other universities and society in general. Tongji's approach to education and student involvement has also been promoted in other parts of China. Beyond serving as role model, Tongji University faculty also plays an important role in the development of national guidelines for an evaluation system and technical support for sustainable campus development across all China.

Joseph P. Mullinix from the National University of Singapore (NUS) described '**Challenges to green campus building in a tropical environment**'. Singapore has experienced rapid economic growth and development during the past few decades accompanied by a strong demand for education and research

as the new knowledge-based economy expands and has greater impact on its high tech manufacturing and service sectors. The National University of Singapore is substantially expanding the size and scope of its educational and research programs to support this economic growth by offering globally competitive education and research and providing a supportive environment to attract and retain the best staff and students.

To support these educational and research initiatives, significant infrastructure expansion projects are under construction including a 250,000 m<sup>2</sup> “University Town” for education, research, housing, and cultural/athletic facilities linked by a bridge to the main campus; a substantial expansion of biomedical research space; an additional 300 residential flats for international staff in the staff housing community; and significant upgrading of physical science and engineering research facilities. This complements recently completed new homes for the law, public policy, conservatory, business and dentistry programs. This expansion, coupled with greater prosperity and rising standards and expectations of the Singapore community, present challenges for sustainable development. These issues are becoming more apparent throughout Asia and are further complicated in Singapore by its location in the tropics on a relatively small island.

The presentation highlighted the development and operational issues identified by NUS as well as concerns and responses. It touched on issues as diverse as development density, master planning and life cycle concerns, district cooling plants and utility pricing, bike paths and challenges of bicycle acceptance and promotion in a tropical environment, and similar challenges of reducing reliance on air conditioning in student housing and class rooms. Further topics were mass transit linkages, ecoponds and a miniature botanical garden, the economic challenges of green development, and integrating our built environment with sustainable planning and research programs.

Sarah Liao then presented on ‘**The University of Hong Kong’s Centennial Campus: Growth and Sustainability in a City Environment**’. As the University of Hong Kong (“HKU”) prepares to celebrate its centenary in 2011, it faces extraordinary academic, social, economic, and environmental challenges. Built on a quiet hillside one hundred years ago, the university now stands in one of the world’s most dynamic and densely populated urban centers, just next door to the industrial center of Guangdong Province. Expansion city-wide of the tertiary system will add several thousand new students and faculty to HKU next year, and a transformation of the undergraduate curriculum is underway. Amidst spatial constraints, a challenging terrain, and pre-existing buildings and infrastructure, the new Centennial Campus will provide much-needed new space and structures designed for maximum resource-efficiency, improved access and connections to the surrounding community, and extensive green areas for teaching, learning and relaxation.

HKU has adopted four principles for the Centennial Campus, from master planning through construction and operation: The Learning Community; Environment and Heritage; A Unified Campus; and An Open and Transparent Process. In parallel with the campus development, the new curriculum and research priorities are designed to meet the constantly changing needs of the city, region, and global community.

**The discussion at the end of this session** raised questions on effective integration of sustainable buildings, technologies and design elements on campuses. First and foremost, stakeholder engagement is critical. In the case of campuses, this includes not only students, faculty and staff of the institutions, but also the surrounding communities. This is important as frequently difficult and complex choices that need to be made that will impact all of the campus stakeholders. For example, in Singapore, a decision was made to only air condition common spaces and classrooms but not the dormitory rooms. As an energy saving measure, the benefits of this decision were clear, however students need to understand why the choice was made. Another example is when campus transportation and mobility options are developed, the neighborhoods around the campus will also be impacted.

Effective sustainable campus design, construction and operations is an ongoing activity that requires ongoing monitoring. Buildings require commissioning once construction is complete, but they also need ongoing monitoring to ensure that they maintain that level of improvement, and maybe even improve upon it. For this to be possible, robust data collection and monitoring systems are required. Just as important as the actual technologies deployed, are the systems used to assess their efficacy. Communication of such efforts can help to engage the campus community.

## 2.3 Learning: integrating facilities and outreach in research and education

Guiding questions of this session concerned: 'How to best create "buildings and campus plans that teach" in relation to sustainable development by demonstrating and inspiring cutting edge research on environmental and social issues?'; 'How to integrate research, education and facilities and transcend disciplinary boundaries, a requisite for socially salient solutions?' and 'What can University communities do to help anchor best practices in society at large?'.

Bart Meehan from Australia National University presented **A designed approach to campus sustainability: infrastructure that can teach at ANU**. Lasting campus sustainability is a combination of engineered solutions and behavioural change. However, many Universities have programs that treat these as separate issues, rather than taking the opportunity to establish an integrated approach. By deliberate design choices, Universities can create built and site infrastructure that provide visual cues to promote the community's awareness of environmental issues, as well as, creating intuitive building systems that reinforce sustainable behaviour. At the core of this integrated approach is the desire to educate the community about the individual's impact on the environmental footprint of the campus. The presentation looked at various ongoing strategies implemented by the Australian National University to educate its staff and students in the function of ecologically sustainable buildings and landscape and through this, to establish a culture that supports behavioural change to improve environmental performance.

Outstanding examples included measures to raise awareness on water consumption and CO<sub>2</sub> emissions of buildings through monitoring and display of results set against daily targets, common campus wide celebration of earth day, and the placement of an innovative and aesthetic photovoltaic system as eye-catching structure at a turnstile type point in the midst of campus.

Jenny Su from the National Cheng Kung University presented on '**Civic engagement towards sustainable rural development by Universities and other levels of schools in Taiwan**'.

This presentation highlighted the rationale and context for recent national policy and funded initiatives to support sustainability developments within Higher Education in Taiwan, including practical and educational aspects. The analysis considered the main policy developments, practical challenges, and future prospects for sustainable development in Taiwanese Higher Education. One main message concerned effectiveness of working in parallel bottom up with students, faculty and staff and teachers in local schools in joint projects and top down on relevant policies for sustainable campus development in Universities and schools. The government initiated and funded a national project that connects education and practice for sustainability, the Taiwan Sustainable Campus Program (TSCP), which profiled the values and importance of civic engagement for the ultimate realization of campus and community sustainable development.

It is hoped that the execution of TSCP will serve as a model for educators and governmental officials, to inform national efforts to promote different methods of sustainability practice and education in different national and social contexts. Several Universities have also signed up to the Talloires declaration on sustainability in higher education, which also helps, and which has also informed the TSCP.

The success of the TSCP design and implementation mechanisms is evident in the rapid growth in the number of institutions taking part over a short period of time. The level of civic, voluntary and productive participation involved suggests that targeted funding for original approaches to connect sustainability practice and education can be an extremely effective vehicle to promote sustainability in Higher Education.

Eddi Omrcen from the University of Gothenburg presented on '**Creating sustainable campuses and cities: How can participation and learning be developed, between businesses, researchers, authorities, decision makers, citizens and organisations?**' The University of Gothenburg and the foundation Mistra Urban Futures are partners in a larger collaborative project for a new international centre for sustainable urban development. Gothenburg and its University are becoming thus

systematically entwined in their sustainable development paths. From early stages onwards in this process, the need for participation, cooperation and learning inside the university as well as outside is proving a key success factor. The goal is to coordinate practical experience and research in order to achieve sustainable urban development. The centre will serve as an arena for development and transfer of knowledge, and the plan is to develop cooperation with the business sector, interest organisations and the public. The centre will start five pilot projects in 2010, which were briefly presented: Multi-level governance for sustainable urban development; building for climate change; urban empowerment; business-driven sustainable development; and urban games: mutual learning for sustainable development.

Keisuke Hanaki from the University of Tokyo discussed the outstanding example of a **'University collaboration with local communities toward the formation of low carbon city in Bunkyo City'**. The University of Tokyo is collaborating with a local non-profit organization and companies located in Bunkyo City of Tokyo, which has a population of 178 000. Because Bunkyo City has many universities, University campuses and schools account for 35% of all floor area of buildings. The university is working with a local non-profit organization together with other local universities to promote energy saving in university campus, elementary and junior high schools and houses in the City. The university is contributing through technological aspects and social survey for the formation of a low carbon city.

**The Symposium discussion on this session** started with remarks on the need to create organisations with sustainability as a value set and the repeated message across all presentations how this works best if pursued at the policy level in terms of guidelines, norms and codes of conducts, vision and mission statements to build an organisational culture at the same time as instituting practical high impact projects with high visibility. People are the solution. Not only do the best building technologies fail if users are not briefed on energy-saving best practices on their sides. The desired multiplier effect education can achieve to spread best practice in society will only work if the community is truly engaged. Participatory processes for planning, choosing targets and implementation measures and projects are key for cohesion and motivation.

## 2.4 Focus: Towards Low Carbon Communities

What tools, concepts and strategies can we develop that help to think, plan and communicate about reducing CO2 emissions in campus communities?

Petra Schweizer-Ries, University of Saarbrücken, Germany, **presented on 'Conceptions of energy and usage strategies in low carbon communities'** from the perspective of an environmental psychologist. Three strategies are important on the way to support sustainable development in the energy sector: consistency, efficiency and sufficiency. The first two are technical and behavioural aspects, whereas the latter is embedded in culture. Looking at Universities, these approaches were highlighted with emphasis on how to change behavioural and mental habits in terms of increasing sustainable energy consumption. Three cultures were highlighted from traditional over actual to sustainable based on energy supply and consumption patterns. Examples from diverse village communities and campuses elucidated participatory approaches and action research towards the choice of goals and implementation options including adoption of renewable energy technologies.

Ying Hua from Cornell University, USA, presented a **Design thinking approach and process** she developed at her University. She asserted that both the establishment of an explicit goal of low carbon or climate neutral society, and an effective action plan and implementation process are critical for achieving the goal. Based on Cornell's climate action plan, Ying Hua introduced a design thinking concept as an effective process to initiate action and implementation plan to achieve campus sustainability. Responding to the first session on the relationship between campus and city, Hua highlighted two factors jeopardising campus and wider community connection: first, modernism's negative impacts on our neighbourhoods, communities and cities, and second, the deconstruction and expansion of campus that destroys the physical connection between campus and city and the collaboration atmosphere for innovation (Yang & Hua, 2008). Cornell's climate action plan and its

development processes highlight the design thinking approach and the importance of demand reduction for curbing campus' carbon emissions. Strategies adopted in Cornell's climate action plan include targeting at planning, development, space use, policy, behaviour, awareness, campus-wide energy generation and distribution, as well as specific technologies used on campus buildings.

Moreover, Cornell and the US National Renewable Energy Lab (NREL) has developed a Climate Neutral Research Campuses website to help research campuses to develop and implement climate action plans. This web-based tool can provide a platform for resource assessment and carbon impact comparison and a commonly accepted data collection methodology for the development of a matrix of climate action options.

The **discussions in session four** included appropriate metrics for low carbon (campus) communities, meaningful targets, and effective initiatives to further carbon savings. Concerning metrics, it was proposed that while energy and carbon per floor area are interesting measures for internal management, energy use or carbon emission figures per person might be more suitable for benchmarking between different organizations. On the point of meaningful goals, a number of participants wondered whether the goal of carbon neutrality, like proposed in the American Colleges and University Presidents' Climate Commitment (ACUPCC) is really meaningful and realistic, or whether it is detracting from more modest but feasible shorter term goals. Experiences with goals of individual institutions under the ISCN-GULF Charter might over the next couple of years give a clearer picture of what seems feasible and meaningful, and offer a more experience-based framework for higher education organizations to plan and communicate their carbon goals. As one of the examples of successful network exchange within the ISCN, the University of Oregon learned of Cornell's climate action plan through the network and used it as inspiration for its own carbon management plan..

It was also stressed that the most carbon saving floor area is the area that you do not build, and that space management that decreases the need for new construction can have the highest rate or return among carbon reduction initiatives. This was discussed as an example that the focus should not always be on efficiency (lowest emissions per floor area) but effectiveness (highest impact of an initiative at comparable cost). Space management at universities is often bogged down in inter and intra-departmental turf fights, and the notion that universities should use their floor area flexibly and effectively (like for example a hotel) does not always go down well with established players in the organization. This is an example that technical solutions (like online space management tools) need to work well within an organizations culture and governance structure to be effective. In addition, it was mentioned that for effective communication and motivation for low carbon work- and live-styles, real live model examples displayed in clearly accessible and engaging case stories are essential.

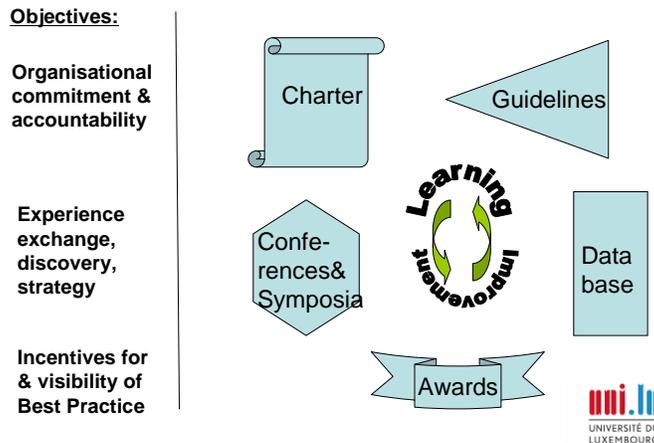
Insights from all four sessions related to all three new Working Groups of the ISCN – highlighting the need for a new approach to foster close collaboration between them.

### **3. Future organisation and work content of the ISCN**

All participants at the ISCN Symposium shared the conviction that as main sites for discovery and education, and in a new role of role models and living laboratories with a civic engagement remit, Universities have a unique role to play in fostering adoption of new technologies and best practices for sustainable development on their campuses and in society at large. Objectives of ISCN are accordingly to foster organizational commitment, provide a platform for exchange and learning, internationally between regional networks and individual organizations. Towards this goal, the ISCN has developed four cross cutting tools in addition to three re-organized working groups (see Figure 3.1. below). One key goal is to provide a platform for world-wide exchange that also builds on and includes prior initiatives and declarations on sustainability in higher education that largely have a regional (ASHEE, HEEPI, FondaTerra) or topical focus and whose global linkages ISCN strives to improve.

This section presents a summary of main points of agreement on the future organisation of the ISCN during discussions of the dedicated session five on the second day of the Symposium at Tongji, as well as from discussions taking place before and throughout the Symposium and interactions thereafter leading up to this report. First, a summary of Bernd Kasemir's presentation provides an introduction and overview of ISCN's activities. Thereafter the cross-cutting tools plans for the three Working Groups and constructive discussions for further developments along all these axes are presented in turn.

## ISCN X-tools to foster campus sustainability



### 3.1 The ISCN hosting future organization, and works streams (Bernd Kasemir)

The International Sustainable Campus Network (ISCN) has been established in 2006, with its first Conference at ETH Zurich held in 2007. It was founded with the objective to enhance universities' commitments to construct, redesign, and organize their campus sustainability and to include the experience in education. To realize landmarks of sustainability in leading universities around the world and to increase the visibility of best practice, the sustainability program of the Swiss ETH (Federal Institutes of Technology) Domain was a main driving force in the development of this international network, and has sponsored a lion share of the operation of the ISCN so far. Since then, an ongoing global experience exchange has been established on all aspects of campus sustainability, with the exchange of concrete case examples of ISCN member universities from around the world as the backbone of shared learning. At and between the ISCN conferences, knowledge exchange and shared learning within the Network has been facilitated by four Working Groups, focused on the Awards Program, the Sustainable Campus Charter, Decision Making on Campus Sustainability, and the Integration of Research, Education, and Facilities. Particularly over the last two years, the ISCN has further matured and the work contributed by many campus sustainability coordinators, faculty members, and university administrators has borne fruit.

Achievements include the start of a track record of best practice cases created by the Awards program, and the development of a Charter document that has been approved in shared discussions between the ISCN and the Global University Leaders Forum (GULF) convened by the World Economic Forum. This Charter builds on key discussion within the ISCN over the last years and structures sustainable campus commitments into three activity areas of first individual buildings, second overall campus infrastructure, and third the integration of research, teaching and facilities. These three areas can be seen as nested spheres that together span the whole spectrum from construction details to a holistic view of the overall sustainability profile of the organization. Based on these experiences and achievements, it is proposed to develop the structure of the ISCN and its work streams further by creating a clearer differentiation into:

- Three explanatory Working Groups that are aligned with the Charter headings: Sustainable Buildings on Campus; Sustainability in Overall Campus Planning; and Integration of Research, Teaching, and Facilities on Campus
- Four cross-cutting tools for more established aspects of implementation and networking: in addition to Conferences & Symposia, these would include Awards, Charter & Guidelines, and Data Base & Web Repository to maintain stable ISCN functions
- Furthermore, a clearer defined ISCN-Secretariat is expected to facilitate the stable organization of the Network's activities and to also receive ISCN-GULF Charter memberships and monitor and communicate the Charter members' commitments on campus sustainability.

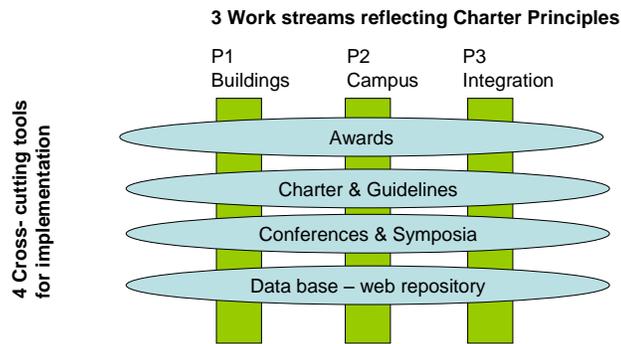


Figure 1. First ideas on future organisation of the ISCN

The ISCN secretariat run by Sustainerv will continue to establish a Charter signature and reporting procedural framework and services relating to it. The partners from the Swiss ETH Domain (EPFL, ETH Zurich, and Novatlantis) will contribute to fund the bulk of the Charter and reporting associated process, but this will need to be complemented by Charter reporting fees that also guarantee access to the Charter reporting data base. The secretariat will explore how best to link the reporting process with the further development of the data base. One option is that the data base has an information repository for charter reports as well as for best practices in design.

### 3.2 The ISCN Charter and Guidelines (Ariane König)

The 'Sustainable Campus Charter' highlights the clear commitment of signatory universities to organise their future development also in view of affecting beneficial environmental and social impacts. The charter was developed by the International Sustainable Campus Network (ISCN) and the Global University Leaders Forum (GULF - a group of 25 heads of leading Universities set up in conjunction with the World Economic Forum). The Charter establishes three main principles of sustainable development, which signatories commit to respect. The ISCN Charter development was lead by the University of Luxembourg with numerous contributions from ISCN and GULF members.

Signatories of the Charter commit to setting concrete and measurable goals and to report regularly and publicly about their progress towards reaching these goals. Goals and targets can be selected adapted to the institutional context, following three overarching principles of the Charter:

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

The Charter, similarly to the UN Global Compact, is built around the idea of shared principles and individually tailored goals. Charter signatories are encouraged to publicly set goals that are challenging but also realistic for their particular circumstances. Over the next years, this will create a body of shared experience among Charter members, strengthening the ISCN's role as honest broker of best practice on campus sustainability. In the discussion, it was suggested that this may lead to alternatives to more blanket targets like the ACUPCC (American College & University Presidents' Climate Commitment) goal of climate neutrality by taking options of member universities into account in a more differentiated manner.

As demonstrated during the last G8 University summit, initiatives to improve sustainable development at organisations of research and higher education are gaining momentum. With the signature of the University of Luxembourg the charter has now been signed by twenty two Universities. These include most members of the Global University Leaders Forum (GULF), amongst them INSEAD and Cambridge in Europe, Harvard and Yale in the US, and Tokyo and Tsinghua Universities in Asia.

The ISCN Guidelines are currently finalized under the lead of the ISCN Secretariat and with inputs from many ISCN and GULF members. They advise on implementation of and reporting on the Charter; by highlighting areas suitable for setting qualitative and quantitative targets and providing guidance on reporting. The guidelines are currently being revised in order to make them compatible with reporting requisites such as the framework of the 'Global Reporting Initiative'. Discussions will explore merits of and challenges to implementation of the charter as well as further tools that can be researched and developed.

In sum, the ISCN and the Charter and Guidelines provide a global network to connect existing initiatives and individual Universities; a focus on the *integration* of research, teaching, and campus infrastructure, operation and planning; and a structured instrument for leaders to choose strategic priorities for their organisation and communicate them at the presidential level. The charter is a governance tool that will foster institutional change as a prerequisite is the dedication of stable resources to live up to commitment.

- Requisites: Target setting and monitoring: will require a process for setting targets and monitoring progress relating to all three principles.
- Reporting: regular reporting is required.
- Fees: contribution of Charter membership fees to ISCN secretariat.
- A priority setting tool: The Charter process provides support for priority setting to more proactively plan a trajectory for endorsing organizations/Sustainable Development Initiatives.
- Networking: access to a network for exchange on reporting experiences with leading Universities.
- International visibility: Signature will provide visibility in an area that will increasingly play a role in rating Universities by students and job seekers alike - globally.

As the Charter has been accepted and signed it should not be changed in the near future. However, the Guidelines will need to be further revised as an ongoing process to assist organizations in defining goals and taking action, including three areas that are at present only implicitly covered but felt key to success by participants:

The need for fostering behavioural change at the individual and institutional level, also by consciously designing the built environment such that users relate to the infrastructure and its design objectives in reducing natural resources use – awareness buildings measures (examples – visible solar panels, monitoring screens reflecting improvement or worsening of energy use in individual buildings, earth day, teaching tools on best practice of individual students).

-- how better to connect campus and urban communities and infrastructures to ensure translation of experiences on campus to urban development and society at large. This involves the civic engagement remit (axes: institutions / individuals; infrastructures/behaviour). It requires thought and possibly research on which impacts can be expected, are considered key for ISCN (economic growth vs. quality of life), and how they achieved (best practice of action through case studies, and how they can be measured).

-- empowerment of students to act as change agents on campus develop tools and suggestions how to empower students to act as change agents. An office that advertises its role as 'boite à idées' and funds to realize small projects. Take Ewoud de Kok's ISCN Excellence Award application as model.

### 3.3 Data network on sustainable campus principles – guidelines – solutions (Rene Lisac)

The database presented at the Symposium will serve as a user-friendly interface to get an easy overview of complex network of sustainability measures that are applicable to campuses, their underlying principles and possible different solutions. The structure and content of the database corresponds to elements included in the ISCN Guidelines, but each point is adapted to a search-system and developed more in detail. Users can change the displayed data base elements according to the desired search criteria.

The database contains a theoretical part based on recommendations and campus structure elements, and a practical part with case illustrations. The theoretical part of the database lists the recommendations based on discussions held in connection with the development of the ISCN Guidelines. Each recommendation is associated with specific categories, to help topical searches of case studies in the database [1]. Each recommendation is assigned to a **field** (environment, society, economy, university development...), and each field has subcategories termed **areas**, as (for example in 'environment': water, CO2, energy, waste, etc.), which in turn are associated with **goals** (for example under 'water': reduce use of drinking water, reduce pollution of wastewater, reduce amount of rainwater, etc.).

The campus structure is considered in the database at different **levels** (urban planning, building, equipment, campus operation and management, university activities, etc.). The levels in turn are subdivided into **segments** (for example under 'building' scale: building form, functional disposition, structure, infrastructure, etc.). This will not only help to systemize goals and to see how different principles might be connected and surf through them, but will show if every part of the specific process (use of water, energy, social processes, etc.) is addressed in the campus sustainability measures. These goals and guidelines should be general, with no practical solutions offered so they can be applicable to all different worldwide situations. Thus, this part of the database is designated the 'theoretical' part.

The second part of the database, the 'practical' part, should offer practical solutions from specific worldwide campus case studies. Each case study measure should be connected to guidelines from the 'theoretical' part. This allows searching on how specific issues have been considered on diverse campuses across the world. The first case studies will help us in gaining experience on how to refine the structure of the database and the case study information for it.

Development of both parts of the database will be interdependent. The process of filling in case studies in the practical part of the database will simultaneously evoke changes and improvements of the theoretical part structure and guidelines, as well as systematisation in theoretical part will give better insight for improving sustainable campus practice. This continuous process should also result in periodical update of the guidelines document.

Discussion demonstrated the success:

- All impressed by professionalism, attractiveness and flexibility of concept.
- Case studies expressions of interest to feed data base from Gothenberg and Tongji, and NSU. ANU in progress EPFL completed.
- Develop scheme that students can populate data base by preparing selected case studies under supervision. If possible develop a funding scheme that students can spend a summer working at other institutions to develop these case studies

And also served to highlight the challenges:

- Develop a quality control system – extended peer review system to ensure very selective uptake of only best practices. Universities can choose of which success stories to highlight in detail but should also provide a comprehensive overview on all measures of sustainable campus development and what priorities were selected.

Roland Stulz will explore a connection of the data base to the League of Cities for Sustainable Development initiative, funding to develop a analogous data bases for campuses and city measures will be explored.

### **3.4 The ISCN Excellence Award System (Matthew Gardner)**

The International Sustainable Campus Network has organized the ISCN Excellence Awards program for the second year. The ISCN Awards recognize three categories of achievement: Excellence in Construction, Excellence in Leadership and Excellence in Student Programs. The presentation focused on the current state of the ISCN Award program, and on how this program can be positioned to raise global awareness of the importance of campus sustainability programs, bring more attention to the ISCN, and increase the participation of the global campus community in the ISCN. Ideas for the future of the ISCN Award program were discussed.

#### **3.4.1 The ISCN Award program**

The ISCN Award program was established in 2009 to recognize outstanding examples of sustainable campus design, construction and operations, as well as exemplary leadership. In 2010, the award categories were expanded to include:

##### **University Executive Leadership Award**

The University Executive Leadership Award is given to the executive leadership of one university that has been selected for making outstanding progress in the integration of sustainability as an organizing principle of the institution.

##### **Excellence in Construction Award**

The Construction Award will recognize a campus development project—a single structure or series of new or retrofitted buildings—that showcases outstanding performance in energy efficiency, minimal CO<sub>2</sub> emissions, or other environmental impacts and/or other sustainability-relevant aspects.

##### **Excellence in Impact Award**

The Impact Award seeks entries of ongoing or completed initiatives that demonstrate how campus development and management can be used to create impact for research, teaching and campus community involvement.

##### **The oikos Student Leadership Award**

From students for students, the award is given to outstanding student projects or campaigns that contribute to a sustainable campus and encourage fellow students to start their own initiatives to make a difference.

Over the past two years, over 50 colleges and universities have applied for recognition from the ISCN Award program.

Future ISCN award categories will be adapted to the three Charter Principles (Buildings, Campus and Integration) in addition to the student award category. In order to broaden the participation in the award program, information about the award program will be disseminated well in advance of any deadlines. New members of the jury team will also be recruited from regions where the ISCN is interested in expanding its constituency.



### 3.4.2 ISCN Excellence Awards Ceremony

Another highlight was the ISCN Awards ceremony. The winners in the four awards categories were:

- Excellence in Construction: The King Abdullah University of Science and Technology in Saudi Arabia
- Excellence in Leadership: Professor Dr. Sascha Spoun, President of the Leuphana University of Luneburg
- Excellence in Impact: University of Bradford for the Ecoversity project
- ISCN oikos Excellence Awards for a Student Project: Ewoud de Kok, for the project "Computer Neutral", a CO<sub>2</sub> neutral computer room at the University of Amsterdam

The 2010 ISCN Excellence Award for Impact was given to the University of Bradford for their Ecoversity project. As recently as 2004 the Bradford campus was widely perceived to be unattractive, dated, energy inefficient and in parts an unsafe place to be. The results were apparent - staff and students turned away from coming to work and study at Bradford.

Not discouraged, the leadership turned to a combination of a sector wide-consultation on sustainable development and creative brain-storming events to produce a transformational vision to turn the unpromising internal conditions to their advantage and launched 'Ecoversity' in 2005. Since that point, the University has seen dramatic improvements in the look and feel of its campus, its environmental performance and the engagement of its students, faculty and staff in the sustainability mission. Key elements have included:

- an integrative\* approach to institutional change embracing environmental, social, ethical and economic dimensions of sustainability
- strong visionary and strategic leadership from multiple points across the University including embedding Ecoversity and ESD in the Corporate Strategy;
- coherent and integrated master planning process including rigorous standards for new buildings and refurbishments;
- new avenues for communications with students, faculty and staff including newsletters, and web-based communications
- policies and procedures to shape the curriculum
- a distinctive student-institutional collaborative student engagement programme - the Ecoversity Student Ambassador and intern programme to engage students on sustainability projects.
- A sophisticated approach to data collection and monitoring a frequently overlooked part of campus sustainability initiatives.

The 2010 ISCN Excellence Award in Leadership was given to Professor Dr. Sascha Spoun, President of the Leuphana University of Luneburg. In his work at Leuphana, Dr. Spoun has overseen the development of a systems-based approach to organizational sustainability, to integrate sustainability in the organization in ways that are derived from a variety of different initiatives and projects, and activities, by engaging a broad range of stakeholders.

He has focused on a three-prong approach, reformulating the Sustainability mission, teaching sustainable development, and sustainable campus operations.

Two of the ISCN Excellence Award winners participated in the Shanghai Symposium, where they were presented their awards. First, the King Abdullah University for Science and Technology (KAUST) in Saudi Arabia, represented by Mr. Abdullah Al Ghamdi, the Director of Environment, Health and Safety, was recognized for the new campus constructed near Thuwal. The design of KAUST responded to a set of extraordinary challenges. In the context of a very hot and humid climate, the team was challenged to make KAUST a low-energy and highly sustainable project that takes full advantage of a stunningly beautiful setting along the Red Sea.

The KAUST team also was challenged to create a contemporary work of architecture that resonated with the global scientific community while being firmly rooted in local Saudi culture.

Through an integrated design process that included a deep commitment to the environment, local communities and energy efficiency, the KAUST design team have built a shining beacon of a campus that is a model for not only campuses in the region, but truly globally. They faced challenges related to water conservation, marine habitat, local community engagement, and mobility that they have since turned into not only the largest LEED-New Construction building in the world, but a true "Learn – Work – Live" campus.

The ISCN Excellence Award for Student Projects was given to Ewoud de Kok, for the CO<sub>2</sub> Neutral Project he lead at the University of Amsterdam. This project is a great example of initiative, entrepreneurship and leadership driven by the enthusiasm of students. Computer Neutral was a project that took the biggest computer room of the University of Amsterdam and made it CO<sub>2</sub> neutral.

The project introduced students to new techniques to reduce our impact on the planet through minimising computer energy wastage, installing energy-efficient lighting and generating electricity directly from sunlight and wind (solar and wind energy). The elements of the project that were most successful have been implemented university wide, and the lessons learned have now been introduced to other universities in the Netherlands.

### **3.5 The ISCN Working Groups**

ISCN activities have been restructured in 2010 to reflect the structure and intent of the new ISCN Charter, which gained its first signatories in January 2010. Three re-structured Working Groups (WGs) corresponding to the 3 Charter Principles are being formed: WG 1 is largely concerned with fostering research and innovation relating to the built environment and campus operation, and WG 2 with campus master planning. Both WGs 1 and 2 can be conceived as supporting further development of interdisciplinary, use-inspired research on infrastructure design and operation that highlights environmental and social planning requisites, as well as the economic aspects in a life-cycle analysis perspective. WG 3 considers how to better integrate such research and the overarching sustainability goals for campus development with the University's education and civic engagement remits.

Synopsis of outlook on working group activities presented in final panel discussion by the WG co-chairs:

#### **3.5.1 Working Group 1: Buildings and their sustainability performance**

Co-chairs: Bart Meehan (National University of Australia) & Ying Hua (Cornell University)

*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.*

This work group is planning to address 3 main themes:

### Building systems integration

As our theoretical and practical knowledge about individual building systems and technologies grows, we need to continually pay attention to systems integration and the pursuit of effectiveness instead of simply efficiency. Building on university campuses have great potential to serve as test beds or living laboratories for research and practice in this area. For building projects on campus, two issues need to be addressed: 1) use the appropriate technologies that are sustainable, economically viable, and address needs from the specific building type, use pattern, and climate type, etc. This includes both building-level and campus-level technologies (links to wg2). 2) considering the fact that many current programs focus on energy-efficient technologies for buildings, WG1 also needs to highlight the magnitude of impact by building energy demand reduction and conservation strategies.

### Interface between occupant and building systems

We are interested in having more “smart buildings”, however, occupant should not be automated out of the system. Buildings on university campuses are optimal built environment to explore how to unlock the great potential of energy and other resources consumption reduction by having educated occupants as an integral part of buildings. Building research and practice will significantly benefit from findings in this area. It can also serve great education purposes to integrate students’ initiatives and to nurture sustainable life style of the young generations.

### Existing buildings

There are significant needs to upgrade the existing building stock in many countries. Many universities are facing the same challenge. How to improve the performance of existing buildings through operation and management strategies, and what are the effective strategies for minor and major retrofit for different building types and climate types are important questions to ask. The answer of these questions will be found useful by many universities, as well as have impact that goes beyond the campuses.

Recommendations for future expansion of this WG into a global research consortium on sustainable buildings that could address siting, programming, envelope, HVAC, lighting, energy supply, water, controls, user interface, etc., with campus buildings as test beds. Identify the expertise in different universities worldwide in terms of different performance aspects. This could be a good complement to the development of the best practice database.

## **3.5.2 Working Group 2: Campus-wide Planning and Target Setting**

Co-Chairs: Bojan Baletic (University of Zagreb), Mikala Holme Samsøe (Danish University Property Agency), Naomichi Kurata (Kogakuin University)

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

The focus for the WG2 is strategy, physical campus planning and working method. The decisions concerning physical planning are often neglected or less prioritized in everyday practice at the universities. Contemporary issues such as Sustainability, Learning environment or Collaboration with Business or Society all potentially have physical implications. The idea that physical planning is a useful approach to solve a wide range of problems at the universities should be promoted. We should also identify way in which this could become an important conversation topic among university leaders, planners and municipality.

The proposal of creating an overview of all the ISCN member campuses is useful in this effort. To combine physical plans (what does campus look like?) with keywords of strategy (which strategic challenges did they work with?) and planning method? (How did they do it?). The group should also define a template that would make sense for every university in ISCN to fill out. The ISCN universities

that are involved in this group should help each other to make this template by creating and reviewing a couple of campus cases. It would be good to be able to present it to all the others at the next conference in the spring.

Both WGs 1 and 2 can be conceived as supporting further development of interdisciplinary, use-inspired research on infrastructure design and operation that highlights environmental and social planning requisites, as well as the economic aspects in a life-cycle analysis perspective.

### **3.5.3 Working Group 3: Integration of Research, Teaching, and Facilities,**

Co-chairs: Ariane König (University of Luxembourg) & Nancy Budwig (Clark University)

*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.*

WG 3 considers how to better integrate research and sustainability goals for campus operation and development with the University's education and civic engagement remits.

The two premises of fostering (1) adoption of research frameworks that emphasize problem solving and use-inspired research and (2) interdisciplinarity in research and education, are seen by some as difficult to reconcile with the strife for excellence as defined for example in ranking tools measuring often frequency and quality of peer reviewed publications within established disciplines. Based on case studies, we will highlight and further develop best practices for 'research and experiential learning methods in living learning campus laboratories' as a key concept for designing curricula, pedagogical practice, research projects and civic engagement activities towards sustainable campus development.

WG3 will build on prior work and case studies conducted under the former ISCN WG IV on 'Sustainable Change Management' and adopt and further elaborate their concept of framing campuses as 'living laboratories' for the development of sustainable solutions (See ISCN Conference Report 2009, pp.y-z). WG 3 will work in parallel to develop two discussion papers and three to five case studies around the themes of interdisciplinarity and use-inspired research for sustainable campus development. We propose to organise one conference sessions in April 2011 on this topic, subsequently publish a book in 2012, and contribute case material to the data base.

#### **ISCN WG3 Activity 2011: Case-based Research on sustainable campus development and community connection**

*Objective:* develop 3 – 6 case studies of 'sustainable university projects' across three continents with a focus on undergraduate curriculum reform and one selected research project for sustainable campus development and connecting campus and local communities. The case studies shall highlight existing tensions and trade-offs in local definitions of sustainable development objectives and approaches to achieve these. Processes for priority setting shall be discussed.

*Suggested structure of a case:* After an introduction with a strategy for sustainable development and connection to local community, how it came about and priorities for its implementation. The case shall provide an:

- 1) overview description of undergraduate curricular reform activities in view of learning for sustainable development – with a focus then on one detailed example of an activity or course.
- 2) overview on sustainable campus research and a detailed description of a sustainable campus research project (possibly student driven)

The two detailed descriptions of the education and research initiatives shall respectively relate to: a. Interdisciplinarity, b. Practice basedness c. Impact on community (-campus community, -local community, and -municipal governance).

**Table 1. Structure of case**

University strategy on sustainable development: origins, development and rational for priorities			
<b>Sections</b>	1. Educational activity	2. Research project	
	a. Interdisciplinarity	a. Interdisciplinarity	
	b. Practice basedness	b. Practice basedness	
	c. Impact on community -campus community -local community -municipal governance	c. Impact on community -campus community -local community -municipal governance	
How to the relate to University strategy on sustainable development?			

*Background Working Paper:* The starting point will be a working paper provided by NB and AK begins with an introduction describing campus as living laboratory for sustainable development. Subsequent sections provide working definitions for: a. Interdisciplinarity as it relates to education and research; b. Practice based research and learning; and c. Impacts on communities and municipal governance (about 5 pages each). The conclusion of this paper will speak to changes in the mission of universities in the face of sustainable challenges with a particular focus on curricular reform and objectives for learning for sustainable development ('building communities of practice' will be used as bridging concept).

At the ISCN conference in Summer 2011, there will be discussion of the first descriptive case studies. We will also explore how case studies might be strengthened with empirical data, in particular as it relates to assessing learning and impacts of change sin curriculum design w.r.t. objectives of learning for sustainable development.

### 3.5.4 Next steps

- All ISCN participants will be informed with brief plans for Working Groups asking for expressions of interest to join a specific Working Group.
- Elaboration of work plan for presentation and implementation at the next ISCN Conference by session chairs and interested participants. First work towards planned case studies or working papers on key topics could be initiated.

**Case study work:** All Working Groups are planning to largely rely on case studies to distill out best practice that shall be highlighted. Some apprehension was voiced on case studies. are we approaching a case study fatigue – is more case studies really what we need. The discussion however concluded in remarking: in order to select best practice to highlight require case studies on what has worked / successful projects and unsuccessful project. Especially for a globally useful information repository a dense mesh of cases that relate to each other and individual situations in diverse ways is key for learning. Sustainability challenges are highly contingent. There seems to be no other way to recognize identify more generally relevant best practice that ISCN shall highlight. We have a searchable data base to help master the cases. We have an awards system to really highlight and put into the spot light out standing achievements. Working group work will further deepened criteria of what is best practice and in what way what is more generally applicable relying on case studies. Reporting will also help to identify and explore cases of best practice.

The conduct of case studies should be coordinated across Working Groups – compare and contrast objectives – identify best way of achieving them by working together or conducting separate more focused case studies: There should be a Working Session at the next conference on the coordination of case studies at which the three Working Groups will compare and contrast their plans seeking synergy in the preparation of case studies.

### 3.6 Financing ISCN

Concerning **Financing** of the ISCN and its core organizational activities, a combination of resources is needed. Support by the Swiss federal research organizations will continue in a modified form (with cost sharing foreseen between EPFL, ETH Zurich, and Novatlantis), Charter membership fees starting next spring will contribute to Secretariat costs, and corporate memberships and foundation donations should be explored. Student exchanges and specific research activities like project on the sustainability/excellence trade-offs mentioned above will likely be funded by specific contributions from a few ISCN member organizations particularly interested in together exploring the topic in question.

**ISCN research projects:** In addition those members who wish to participate in a more engaged manner can contribute funds towards research projects linking interests of 2-4 ISCN members. One project example that met broad interest of participants was the investigation of means to achieve behavioral changes of users of buildings to reach the potential energy efficiency as conceived by planners and engineers. The IARU on line learning tool could be integrated in this research as well as diverse display approaches of building energy use and how users relate to it. This research work could also serve to further develop the principle of universities as living laboratories.

**Additional network funding:** A network proposal will be prepared and submitted to foundations. Activities to be funded will include: - building platform of exchange – describe the x-cutting tools above - networking activities; - student fellowships / internship programme to help populate design data base with design cases, and to build a reporting data base pass word protected for signatories. Continue to plan to expand scope of ISCN to embrace corporate campuses and members for the medium term.

## 4. Conclusions and Next steps

The Shanghai ISCN 2010 Symposium addressed key questions at the interface between sustainable campus and sustainable setting. The conference location at the World Expo 2010 and on Tongji University Campus in Shanghai, one of the rapidly developing Asian cities, was a perfect illustration of the challenges and opportunities for sustainable urban development, where campus projects can play a path finding role.

The Symposium also marked a key point in the ISCN's development. With this meeting, the network has now fully arrived in Asia, in addition to its earlier consolidation amongst European and American participants. The extended scope of the ISCN's networking activities will be reflected in the dissemination of the Charter process and the Awards program. It will also be reflected in an ISCN Book Project that is planned as a follow-up to the Shanghai meeting (see Appendix II for details).

Next steps after the Symposium and this Summary Report are foreseen to include:

- Finalize date and location of 2011 ISCN Conference (likely spring/summer in Scandinavia)
- Drive the book project reflecting selected contributions for the Shanghai Symposium to completion.
- Finalize Working Group focus statements for the three groups
- Invite ISCN members to participate in the new WGs
- Develop research outline for the sustainability/excellence tensions project
- Increase collaboration with major new campus construction efforts –e.g., Paris-Saclay, new campuses in the Middle-east, large new campuses in China
- Explore interest and funding opportunities for ISCN student internship program
- Work with Charter signatories to ensure first reports in time for 2011 Davos WEF meeting

## APPENDIX I: Participants

### ISCN SYMPOSIUM "Better Campus, Better City: Learning for a Sustainable Future" Shanghai Expo & Tongji University, 27-28 July 2010

page 1/2

First Name	Last Name	Institutional Affiliation	Country
Diane	<b>ABBOTT</b>	National University of Singapore	Singapore
M.	<b>ARAI</b>	Kyusyu University	Japan
Bojan	<b>BALETIC</b>	University of Zagreb	Croatia
Tom	<b>BECKER</b>	University of Luxembourg	Luxembourg
Tan Kai En	<b>CALVIN</b>	National University of Singapore	Singapore
Yulu	<b>CHEN</b>	Renmin University	China
Xiaolong	<b>CHEN</b>	Tongji University	China
Tomoyuki	<b>CHIKAMOTO</b>	Ritsumeikan University	Japan
José	<b>CHONG</b>	Technische Universität Darmstadt	Peru
Loo	<b>DELIANG</b>	National University of Singapore	Singapore
Song	<b>GAO</b>	Qsinghua University	China
Matthew	<b>GARDNER</b>	Sustainserv Inc.	USA
Ning	<b>GU</b>	Fudan University	China
Keisuke	<b>HANAOKI</b>	University of Tokyo	Japan
Kerstin	<b>HÖGER</b>	Norwegian University of Science and Technology	Norway
Ying	<b>HUA</b>	Cornell University	USA
Hongmin	<b>JIANG</b>	Shandong University	China
Bernd	<b>KASEMIR</b>	Sustainserv Inc.	Switzerland / USA
Michael Kasolo	<b>KIGOZI</b>	Students for Global Democracy	Uganda
Ann	<b>KILDAHL</b>	The University of Hong-Kong	Hong-Kong
Ewoud	<b>De KOK</b>	University of Amsterdam	The Netherlands
Hisashi	<b>KOMATSU</b>	Nagoya University	Japan
Ariane	<b>KÖNIG</b>	University of Luxembourg	Luxembourg
Iru Gbassay	<b>KOROMA</b>	Youth Action International-SL	Sierra Leone
Naomichi	<b>KURATA</b>	Kogakuin University	Japan
Da	<b>LEE</b>	SK Telekom, Seoul	Korea
Guoqiang	<b>LI</b>	Shandong University	China
Lijun	<b>LIANG</b>	Qsinghua University	China
Sarah	<b>LIAO</b>	The University of Hong-Kong	Hong-Kong
René	<b>LISAC</b>	University of Zagreb	Croatia
Bin	<b>LV</b>	Beijing University	China
LivKartvedt	<b>LYSKJAER</b>	Danish University and Property Agency	Denmark
Zhixue	<b>MA</b>	Chinese Embassy	China
Bart	<b>MEEHAN</b>	Australian Natinal University	Australia
Steve	<b>MITAL</b>	University of Oregon	USA
Minoru	<b>MIZUNO</b>	Osaka University	Japan
Joseph	<b>MULLINIX</b>	National University of Singapore	Singapore
Michitomo	<b>OHKUBO</b>	XYMAX Bulding Science	Japan
Eddy	<b>OMRCEN</b>	University of Gothenburg	Sweden

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**ISCN SYMPOSIUM "Better Campus, Better City: Learning for a Sustainable Future"  
Shanghai Expo & Tongji University, 27-28 July 2010**

page 2/2

First Name	Last Name	Institutional Affiliation	Country
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Lixia	<b>QIAN</b>	Chinese Embassy	China
Lijuan	<b>QU</b>	Zhejiang University	China
Juan	<b>REISER</b>	Pontificia Universidad Catolica del Peru	Peru
Takeru	<b>SAKAI</b>	Kyushu University	Japan
Mikala Holme	<b>SAMSØE</b>	Danish University - Property Agency, Ministry of Science	Denmark
Petra	<b>SCHWEIZER-RIES</b>	University of Saarbrücken	Germany
Yoshiyuki	<b>SHIMODA</b>	Osaka University	Japan
Shuangjiang	<b>SONG</b>	Renmin University	China
Shacsha	<b>SPOUN</b>	Leuphana Universität Lüneburg	Germany
François	<b>SPRUMONT</b>	University of Luxembourg	Luxembourg
Roland	<b>STULZ</b>	Novatlantis - Sustainability at the ETH-domain	Suisse
Huey Jen	<b>SU</b>	National Cheng Kung University	Taiwan
Yuan	<b>SU</b>	Waseda University	Japan
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Junwei	<b>YAN</b>	Southern China Univ. of Techonogy	China
Xiaodi	<b>YANG</b>	Carnegie Mellon University	USA
Qiwei	<b>YANG</b>	Committee of Education of Shanghai	China
Deming	<b>YANG</b>	Committee of Construction of Shanghai	China
Jing	<b>ZHAO</b>	Tianjin University	China
Baotong	<b>ZHU</b>	Ministry of Education	China
Neng	<b>ZHU</b>	Tianjin University	China

**And 5 members of the Chinese Green Building Committee**

# APPENDIX II: Shanghai follow-up ISCN Book Project

**Title:** 'Better Campus, Better City: Learning for a Sustainable Future'

*Main target audience:* Academics. Secondary audience: practitioners and policy-makers concerned with the Sustainable University.

*Writing style:* An accessible and animated and matter of fact presentation of actual measures adopted to make University campuses, communities and programmes more sustainable, and to better connect them to adjacent cities. What were the challenges hidden tensions in the concept of sustainable development in that particular social context, what did or did not work as expected? What were the impacts and real achievements – in figures where relevant?

**Table of Contents** (chapter titles are just place holders – please feel free to change)

Preface

- |  |  |
|--|--|
| 1. Ariane König  | Learning for a sustainable future:<br>(Objectives of the book, core argument, overview)                    |
| 2. Ying Hua  | Designing a climate action plan at Cornell   |
| 4. Bart Meehan   | Using the campus infrastructure to change attitudes and values at ANU                                      |
| 5. Joe Mullinix  | Creating an environment for discovery and learning at NUS  |
| 6. Hongwei Tan   | Tongji: A living laboratory for the Expo and urban design  |
| 7. Sarah Liao & Ann Kildahl                              | HKU: Growth and sustainability in a city environment   |
| 8. Kerstin Höger   | ETH Zürich: efforts to better connect a green field campus to the city                                     |
| 9. Eddi Omrcen   | Improving cooperation between research and practice in Sweden  |
| 10. Ariane König, Tom Becker, Markus Hesse & Xavier Poos | Building a sustainable university and anticipating urban and regional impacts                              |
| 11. Nancy Budwig   | The city park project at Clark's   |
| 12. Naomichi Kurata, Takao Ozasa, & Takeshi Ueno         | Campus planning for promoting regional quality of life   |
| 13. Rene Lisac and Bojan Baletic                         | Have World Expos helped to improve urban environments – and what lessons can be drawn for campus and city? |
| 14. Ariane König   | Better connecting campuses and cities  |

Part I focuses more on measures for more Sustainable Campuses (Chapters 2-5) and Part II shifts the emphasis on connecting or integrating Campus and City (Chapters 6-11).

Editor: Ariane König

First draft chapters -- target submission date: mid-November.

## **Flexible guidance for chapter structure (about 6000 words)**

### **Summary (~300-400 words)**

#### **1. Introduction**

Context: country, population, geography, total no. of Universities)  
Expectations from and role of University (research-centred / education)  
Type of your campus: green field, city-embedded, or science park?  
Financing and Governance model  
Scale (no. of staff and students and researchers)  
Is sustainability a priority?

#### **2. The place of and organisation for sustainability at the University**

##### *2.1 Sustainable Development- the organizational philosophy in general(300 words)*

What are the priorities and goals set for sustainable development in the coming 5 years, why and how were these selected (decision-process and financial mechanisms, and resulting rationale for SD and how it relates to the context the University operates in)? What resources are dedicated to attain these? What are the main challenges and tensions, can they be addressed?

##### *2.2. Particular measures: infrastructure, operations, management and planning*

##### *2.3. From sustainable campus to a sustainable University: education and the campus community*

##### *2.4. Measures to integrate facilities, planning, research and education*

How do you conceive the campus as a living laboratory. What are exemplary projects?  
How do you enable students to act as change agents?

##### *2.5. Civic engagement – engaging with society (700 words)*

How do you translate experiences from campus – technical solutions and best community practice?  
What measures to connect campus and city have you tried (infrastructure and communities)? What failed, what was achieved – how and why?

#### **3. Conclusion**

*Towards the sustainable University: highlights, outstanding challenges, key future research needs  
What measures have been most successful in connecting campuses and cities and why?*

### **References**

# CONTACTS

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