The European Campus

Heritage and Challenges

Alexandra den Heijer
George Tzovlas

The European Campus
Heritage and Challenges

Information to support decision makers

Alexandra den Heijer
George Tzovlas

Colophon

This book can be referred to as: Den Heijer, Alexandra and George Tzovlas (2014), The European campus – heritage and challenges, Information to support decision makers, Delft: Delft University of Technology, October 2014.

Authors
- Alexandra den Heijer – TU Delft, associate professor – a.c.denheijer@tudelft.nl
- George Tzovlas – TU Delft, PhD research – g.e.tzovlas@tudelft.nl

Cover and graphic design by George Tzovlas. For more background information about the authors and this research project, see: www.managingtheuniversitycampus.nl

Acknowledgments

The authors want to thank the following people for their support and creative thinking in the first stages of this comprehensive project.

- Dirk Jan van den Berg – President TU Delft
- Karel Luyben – Rector Magnificus TU Delft, President Elect CESAER
- Hans Beunderman – TU Delft, former vice-rector and dean Faculty of Architecture
- Gert Jan Scheurwater – TU Delft, Secretary General / Director Strategic Development
- Karin Laglas – TU Delft, former dean Faculty of Architecture and the Built Environment
- Hans Wamelink – TU Delft, chair department of Real Estate & Housing, acting dean
- Hans de Jonge – TU Delft, professor Real Estate Management
- Monique Arkesteijn – TU Delft, assistant professor / chair Corenet Benelux
- Flavia Curvelo Magdaniel – TU Delft, PhD researcher (technology campuses)

- Robert-Jan Smits – European Commission, DG Research & Innovation
- Peter van der Hijden – European Commission, policy officer
- Audrey Goosen - European Commission, policy officer
- Thomas Estermann – European University Association – Director Governance, Autonomy & Funding Unit
- Enora Pruvot – European University Association - Programme Manager - Governance, Autonomy & Funding Unit
- Marceline du Prie – EU liaison EU Liaison, special advisor to the TU Delft Board on European Affairs

Published by Delft University of Technology (TU Delft)
Delft, the Netherlands - a.c.denheijer@tudelft.nl / www.managingtheuniversitycampus.nl

ISBN / EAN 978-90-817283-2-4

Many photos in this book are used to illustrate unique qualities of the European campus - more references, sources, links to universities, background about some projects can be found online: www.managingtheuniversitycampus.nl/european-campus (page numbers as references). We have made every effort to trace and contact copyright holders. If an error or omission is brought to our notice we will be pleased to remedy the situation in future editions of this book. For further information, please contact the authors.

Preface

The European campus is a crucial enabler for the future of Europe. This proposition triggered a comprehensive research project that explores university campuses in all 28 European Union (EU) member states. The current publication summarizes the state of the European campus. It highlights the heritage – illustrated with many photos – and underlines the challenges that more than 800 European universities are confronted with.

The quality of European universities, including their physical infrastructure, not only affects policy agendas of education, research and innovation, it affects Europe's position in the global 'battle for brains'. The 'fitness for purpose' of the European university campuses should be explicitly part of a strategy for smart, sustainable and inclusive growth.

This book – covering the data of 28 EU member states – emphasizes that the European campus (still) has the heritage and inner-city locations that provide students with a life experience as much as a learning experience. The unique qualities of European cities add to 'sense of place' and attract students from all over the world.

However, the last part of the book compares country data and draws conclusions about age profile, condition, footprint etc. Many universities are investing in new state-of-the art facilities, but this heavily affects their financial sustainability. At the same time, many existing European campuses are in very poor functional and physical condition, which negatively influences productivity and satisfaction of users. This requires reinvestment, but most of all: smart strategies.

Based on thorough data collection, best practices and prior research about managing university campuses this book suggests campus stress testing as a tool for assessing the 'fitness for use' of today's campuses. Sharing knowledge, benchmarking and self-assessment tools will map the readiness of Europe's higher education infrastructure to engage global competition. And, crucially, pin-point key areas of deficiency, just as banking stress tests do. Some of these challenges are operationalized in this book.

This research project is conducted in close collaboration with European university networks and policy officers of the European Commission (EC). In the coming years Alexandra den Heijer (associate professor) and George Tzovlas (PhD researcher) will explore new theories for managing university campuses and provide information and tools to support decision-making in practice.

This first book – with its many facts, maps, figures and photos – sets the European campus agenda. It is relevant for presidents, university board members and policy makers from university to EC level, but also for (future) students, staff and visitors who are more than welcome at the European campus.

Dirk Jan van den Berg
President of Delft University of Technology (TU Delft)
Delft, October 2014

Delft, campus Delft University of Technology (TU Delft)

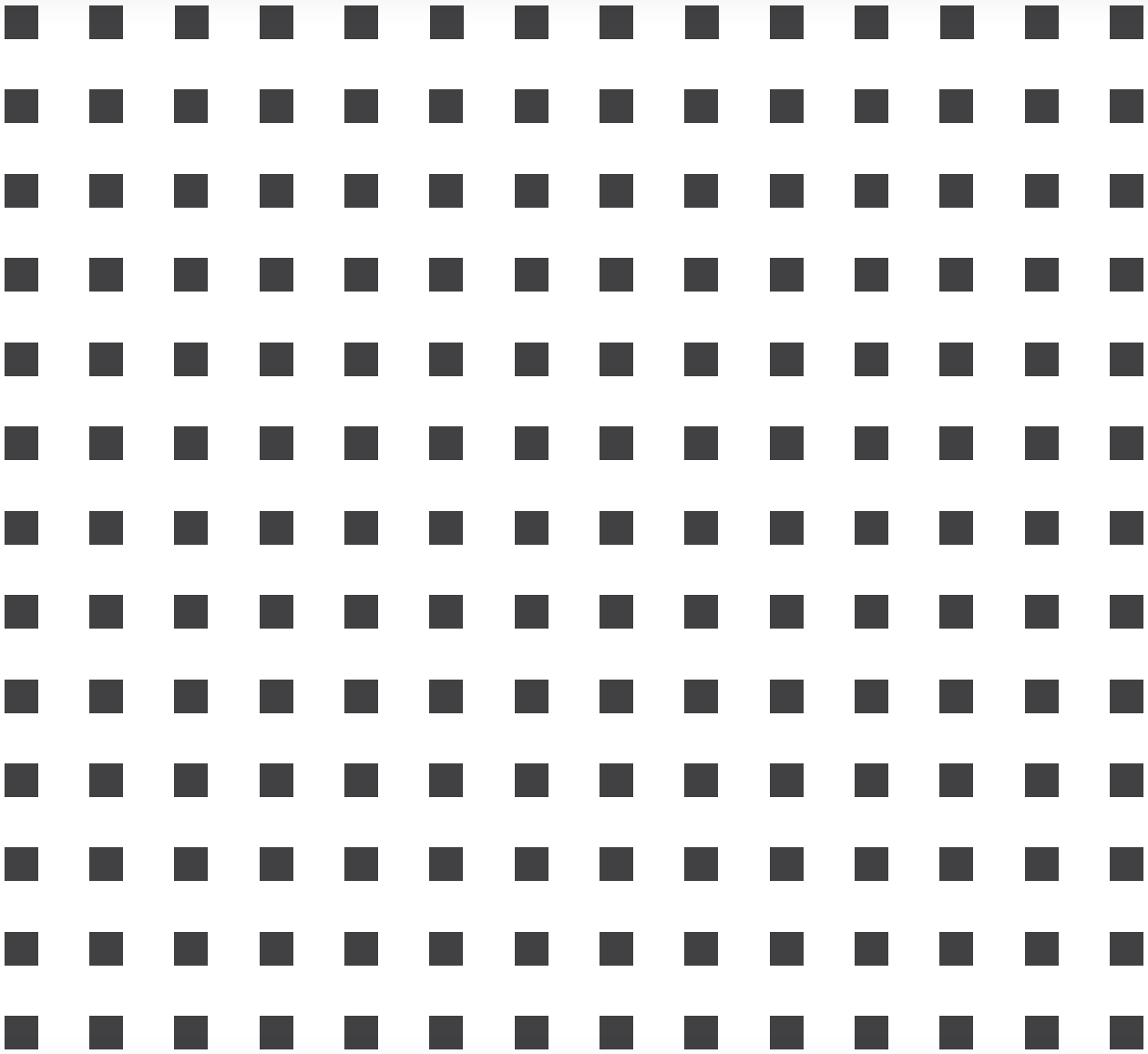
Part A | Introduction

Part B | Presenting Information

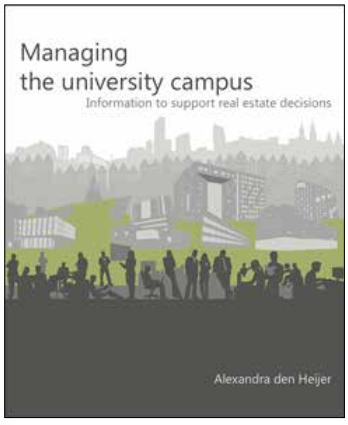
Part C | Conclusions

Table of Contents

Presenting Information | Part B



Part A



The basis of this research is the dissertation of Alexandra den Heijer, “Managing the university campus”, based on ten years of research. Additional information about this book and related publications at:

http://managingtheuniversitycampus.nl

Background

Basis of this research

On March 4, 2011 Alexandra den Heijer defended her PhD thesis "Managing the university campus" (Den Heijer 2011), based on ten years of research. Her book summarized insights from international literature and Dutch practice – fully supported by the fourteen Dutch (research) universities and with input from many European campus management networks. Since the book was launched, Alexandra has been 'on tour', with a focus on Europe, invited by academic and professional networks. The overwhelming attention confirmed the relevance of sharing knowledge about "managing the university campus" in the European context.

Academic basis of the research team

At Delft University of Technology (TU Delft) this project is related to the research programme "Innovation & Management of the Built Environment" at the Faculty of Architecture. In a research team (chair of Real Estate Management) managing property of higher education institutions is assessed from many different perspectives: from accommodating the student and researcher of the future ('the changing academic workplace') to connecting campus and knowledge city for mutual success (PhD research Flavia Curvelo Magdaniel about "Technology campuses in cities"). While based at a faculty of architecture and university of technology, this research team also uses theories from psychology, economics and management sciences.

Problems and challenges for the European campus

The dissertation "Managing the university campus" started with the quote from former Harvard president (1971-1991, 2006-2007) Derek Bok: "If you think education is expensive, try ignorance". This statement was transformed into: "If you think university buildings are expensive, try ignoring them". International campus research often highlights the positive impact of campus projects on the productivity (enabling better research and innovation) and competitive advantage of universities (higher rank), while it is equally important to investigate the negative impact of 'not investing in aging university buildings' on competitive advantage (less attractive for students and staff), productivity (less output per m2), profitability (higher operating costs) and sustainable development (larger ecological footprint). Our research team explores both.

We strongly believe – based on research – that improving (the management of) the European campus is a precondition for attracting and retaining Europe's knowledge capital, for more competitive EU universities in the global 'battle for brains' and for supporting innovation in the EU economy. This aligns with the EU's growth strategy "Europe 2020": "*In a changing world, we want the EU to become a smart, sustainable and inclusive economy. These three mutually reinforcing priorities should help the EU and the Member States deliver high levels of employment, productivity and social cohesion.*" (http://ec.europa.eu/europe2020)

Involving EUA and the European Commission

The shared challenges of European universities - and the similarities in their situations and strategies - were emphasized during the 2012 Annual conference of the European University Association (EUA) in Warwick – where TU Delft's campus research team organised a workshop to inform and involve board members of European universities. Their enthusiasm convinced us to involve the European Commission (EC) in exploring the possibilities to strengthen the European network of campus management expertise, with input from theory and practice.

Problem statement of this research

In the current European context the university campus can be perceived as a (potential) problem as well as an asset for European universities, and consequently for Europe's knowledge economy and Europe 2020: a strategy for jobs and smart, sustainable and inclusive growth.

Proposition 1
The European campus is an asset for Europe's knowledge economy: an 'enabler' for Europe 2020.

Proposition 2
The European campus is a (potential) problem for Europe's knowledge economy: a 'disabler' for Europe 2020.

Based on the conclusions of "Managing the university campus" - which can be found in part C of this book – these two propositions were subdivided in eight statements, which are described and visualised on the following pages.

Propositions

European Campus as an Enabler for Europe 2020

1.a Universities as growth engines – place matters.

1.b European knowledge economy accommodated in cultural heritage buildings.

1.c European univer-cities considered attractive places to live, work, be.

Propositions

European Campus as a Disabler for Europe 2020

2.a + 2.b More than half of the university buildings from 1960s-1970s, in bad technical & functional state.

2.c Low utilisation rates, high vacancy rates in offices, laboratories, classrooms.

2.d + 2.e Campus costs about 5% to 15% of university budget, affecting their financial sustainability.

Propositions

European Campus as an Enabler for Europe 2020

1.a Universities as growth engines – place matters.

1.b European knowledge economy accommodated in cultural heritage buildings.

1.c European univer-cities considered attractive places to live, work, be.

Propositions

European Campus as an Enabler for Europe 2020

1.a Universities as growth engines – place matters.

1.a "Universities are economic growth engines: where they are located increasingly determines where European economy will grow and where innovation will take place ("place matters")."

Prior research (Van den Berg et al. 2005, Perry et al. 2009, Curvelo 2010, Den Heijer 2011) shows that universities contribute to the urban and regional economy in many ways: they are large employers, they attract knowledge workers whose presence will be a key factor in attracting businesses that depend on them, they generate start-ups, research institutes and other innovative spin-off, they attract visitors (for conferences, academic networks, graduation ceremonies and other events) that need hotels, restaurants and other urban functions and they accommodate an increasingly international population that will consider the university city their home, at least for a certain period in their lives (purchasing power).

1.b European knowledge economy accommodated in cultural heritage buildings.

1.b "More than anywhere in the world European universities are (still) accommodated in cultural heritage buildings - in historical inner cities - that highlight both the history of Europe and the history of these universities."

Europe has the oldest universities in the world and many European universities still own or use the buildings they added to their campuses centuries ago. Prior research (Den Heijer 2011) shows that there is a tendency towards selling these buildings and building new buildings for similar functions, usually on locations that are further away from the city centre. Reasons are the relatively high market values (due to their inner-city locations), the relatively high operating costs and the inflexibility for growth. However, when in- creasing the benefits per m2 – either by intensifying use to allow many user groups to enjoy the heritage or by allowing external users who pay rent – heritage buildings could still turn out feasible business cases for universities. There are many European references that illustrate this (Den Heijer 2011).

1.c European univer-cities considered attractive places to live, work, be.

1.c "The qualities of the European city and the quality of European campus facilities are key in attracting and retaining knowledge workers – both students and talented researchers; universities and cities (should) increasingly join forces in branding "the European experience"."

Europe has the oldest universities in the world and many European universities still own or use the buildings they added to their campuses centuries ago. Prior research (Den Heijer 2011) shows that there is a tendency towards selling these buildings and building new buildings for similar functions, usually on locations that are further away from the city centre. Reasons are the relatively high market values (due to their inner-city locations), the relatively high operating costs and the inflexibility for growth. However, when in- creasing the benefits per m2 – either by intensifying use to allow many user groups to enjoy the heritage or by allowing external users who pay rent – heritage buildings could still turn out feasible business cases for universities. There are many European references that illustrate this (Den Heijer 2011).

Propositions

European Campus as a Disabler for Europe 2020

2.a + 2.b More than half of the university buildings from 1960s-1970s, in bad technical & functional state.

2.a "The majority of university buildings dates from the 1960s and 1970s, requiring substantial reinvestments, at the cost of investments in education & research (but adding to their quality)."

2.b "Dysfunctional facilities and unattractive (desolate) campus locations can chase away knowledge workers, which negatively affects productivity and competitive advantage of higher education institutions."

One of the starting points of this research about the European campus is the – to some extent "hidden" – problem of dysfunctional, energy-inefficient and ageing buildings.

As a research team we want to investigate the scale of this problem (in m^2) and estimate how many (financial) resources are required to improve the quality of the campus, in terms of functionality, technical condition and energy-efficiency. European universities can use each other's strategies and references as benchmarks for their campus (investment) plans.

2.c Low utilisation rates, high vacancy rates in offices, laboratories, classrooms.

2.c "Also as a consequence of proposition (2b), laboratories, lecture rooms and academic offices have low occupancy rates – are underutilized – according to space utilization studies in many European countries; strategies to replace 'territory' with 'spaces to share' are difficult to implement."

Traditionally, many functions on campus are assigned to certain groups: designated meeting rooms, laboratories for specific research teams and lecture halls that are exclusively used by one faculty or school. Generally, these "use patterns" are not reconsidered during the use of the building, until users complain that there is a shortage of a certain space type. Even then, a more common strategy is to add space instead of rethinking territorial issues. The latter can save space, energy and financial resources and could even add to more interaction on campus, which contributes to innovation (cross-overs between different scientific disciplines). So, intensifying the use of space – which seems like an efficiency measure – could also add to achieving primary goals of universities. Our campus research team will gather evidence of both the (low) occupancy rates and the effectiveness of intensifying use (less territory, more shared space) as a campus strategy.

2.d + 2.e Campus costs about 5% to 15% of university budget, affecting their financial sustainability.

2.d "The average Dutch university is spending 10-15% of the resources on physical infrastructure; this percentage is a reference for European universities and is likely to increase due to backlog maintenance (and aging buildings on European campuses)."

2.e "Consequently, the increasing costs of (ownership of) the campus negatively influence the financial sustainability of higher education institutions."

This research is aiming at collecting reliable data to estimate the investment that is necessary to improve the quality of the European campus. Depending on (quality) ambitions – from a minimal technical condition to landmark buildings (including the cultural heritage buildings) that inspire and attract knowledge workers – the investment level ranges. This research aims at supporting universities in finding the right strategy, spending their financial resources smartly and optimizing the use of their physical footprint. Assessment tools (like a 'campus stress test') can help decision makers at European universities transforming their current campuses into campuses accommodate the university of the future.

Propositions

European Campus as a Disabler for Europe 2020

2.a + 2.b More than half of the university buildings from 1960s-1970s, in bad technical & functional state.

2.c Low utilisation rates, high vacancy rates in offices, laboratories, classrooms.

2.d + 2.e Campus costs about 5% to 15% of university budget, affecting their financial sustainability.

Goals of the research

At many European universities there is a mismatch between the ambitious campus plans (and investment programmes) and the expertise and capacity of campus management departments. One of the challenges is to share knowledge about campus management in a European network: knowledge from practice (from benchmark studies and professional networks) and knowledge from theory (produced by academics), or a combination of both.

There are three different goals of this research project - valorisation, research and network - which are related to different target groups.

Valorisation goal: Exploring (management of) the European campus to support the decision-making process of policy makers on multiple levels: individual universities, EU member states, European Union – related to the Europe 2020 policy.

Research goal: Building a knowledge base for (managing) the European university campus, with input from theory and practice – with references from 28 EU member states.

Network goal: Creating a European campus management network with existing campus organisations, campus directors of universities and academics – connecting professionals and scholars in this field of study.

The research and network goals are supporting the valorisation goal: to learn from each other and make sure that European resources for campus infrastructure are spent in the most effective and efficient way.

Relevance European campus research for the European Commission (EC)

Based on the problem statement the European campus can be both an enabler and disabler for the Europe 2020 agenda. Resources that the European Commission allocates to EU member states for campus infrastructure should be spend in the most effective and efficient way. Member states should be supported in their decision making with assessment tools (like a 'campus stress test') and references ('best practices') from other EU member states.

The idea of a 'campus stress test' comes from Robert-Jan Smits, DG Research & Innovation at the European Commission. He suggested this assessment tool in January 2013, at a meeting with EC's Peter Droell, Audrey Goosen, Peter van der Hijden and Denise Heijligers and TU Delft's Hans Beunderman, Marceline de Prie and Alexandra den Heijer. Since then, this idea has been developed into a concept and is subject of George Tzovlas' PhD research from 2014.

Conceptual framework for campus management

Some key performance indicators (KPIs) that would be part of a "campus stress test" have already been used for the data collection of this research. These are derived from the conceptual framework for campus management (Den Heijer 2011). This framework defines four perspectives and variables that need to be integrated in every campus decision: physical (m^2), functional (users), financial (euros) and strategic (university goals). This aligns with the proposition that every campus decision positively or negatively affects the university's performance: competitive advantage, productivity, profitability and sustainable development.

Decisions about university campuses affect strategic (goals), financial (euros), functional (users) and physical (m^2) variables, linking to performance indicators of various stakeholders: competitive advantage, productivity, profitability and sustainable development - see figure 1 - on university level, country level and EU level.

The campus is a key asset in the global 'the Battle for Brains', influencing:

- competitive advantage (university rankings) in attracting talent (strategic perspective)
- productivity, creating effective workplaces for future students, staff (functional perspective)
- profitability, financial sustainability, resource-efficiency (financial perspective)
- sustainable development, footprint in m^2 per user (physical perspective)

This conceptual framework was used in prior research to assess university buildings and university campuses. In this book it will also be used to assess the campus data of EU member states and it will be the basis of a 'campus stress test' that will be developed in the next phase of this research project.

Content of part A, B and C

The next sections of part A contain more detailed information about focus, methodology and KPIs.

Part B of this research describes and illustrates the current state of the European campus in 28 EU member states.

Part C compares the data, draws conclusions about decisions that shaped today's European campus and gives recommendations for the European campus of the future.

Part C also elaborates on the idea of the 'campus stress test' as a tool to support decision makers at European universities, campus management organisations and (inter)national governments about campuses, see Figure 2.

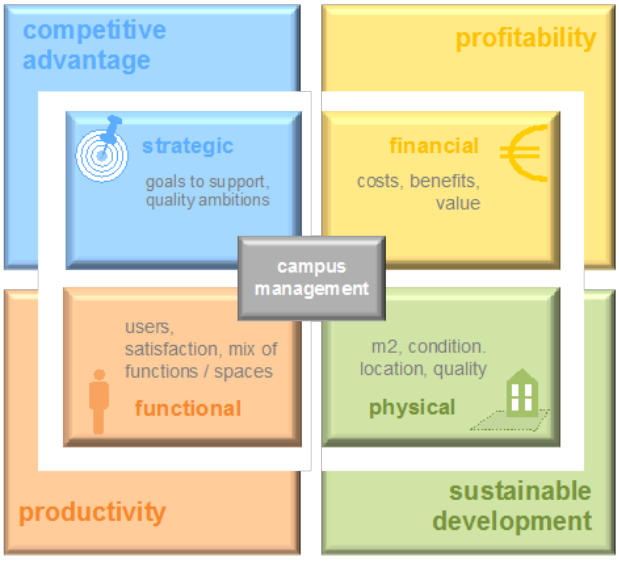


Figure 1.
Decisions about university campuses affect strategic (goals), financial (euros), functional (users) and physical (m^2) variables, linking to performance indicators of various stakeholders: competitive advantage, productivity, profitability and sustainable development on university level, country level and EU level; this is the basis of a 'campus stress test' (Den Heijer, 2011).

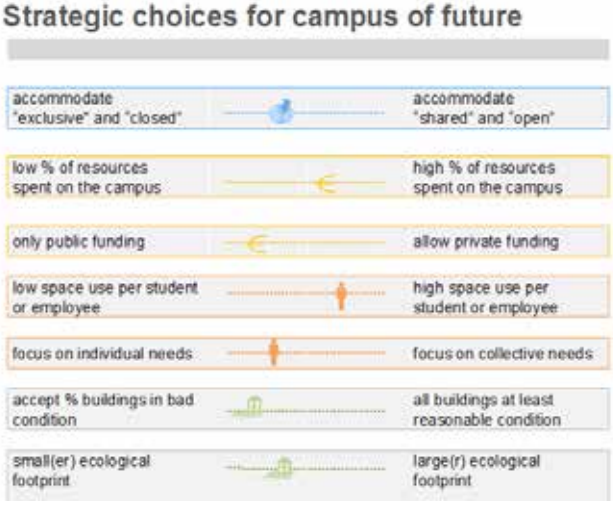


Figure 2.
Simple example of potential variables in a stress test – this research project aims to add ratios to the scales, based on references from 28 EU member states (Den Heijer, 2011). More information about the campus stress test can be found in part C.

Focus and Scope

The focus of the research is on Higher Education Institutions (HEI) that provide PhD education, recognised in most European member states as universities. Therefore, referring to the Bologna Process, after which the European Higher Education Area (EHEA) was created, the research focuses on these HEIs, that based on the Qualifications Framework of the EHEA, provide third cycle education, doctoral education. The Qualifications Framework was adopted by the European ministers in Bergen, in 2005. It defines the qualifications in terms of learning outcomes, which can be addressed as statements of what students know and can do on completion of their degrees. In describing the three cycles, (1st Cycle, 180-240 ECTS, 2nd Cycle, 90-120 ECTS, 3rd Cycle not specified) the Qualifications Framework measures the qualifications obtained through the European Credit Transfer and Accumulation System (ECTS) (EHEA,2014).

Moreover, the research focuses on the public universities, where the majority of the European students is currently enrolled to (more than 60% of total HE student population). In addition, public universities are a public asset, primarily financed by national and European funds (60% to 70% of their total income). Therefore it is important to assess the return of that national and European societal investment, by exploring their current performance.

The research addresses the performance of the university as an organisation and the contribution of its real estate, as one of its resources that support its primary process. The real estate of an organization is often referred to as its fifth resource that cannot be separated from the other four, capital, human resources, information and communication and technology. These resources may reinforce each other, but they can also neutralize or in the worst case have a combined negative effect. The organizational model incorporating the five resources is applicable in the case of a university with specific interpretations of input, output, stakeholders and performance (Den Heijer,2011). For the research, the primary focus lies within the university human resources as its real estate users (students, teaching and administrative staff) and the capital, as the available financial resources.

Methodology

In order to collect information from 28 different systems conducting a web-research., it was necessary to develop a consistent and systematic methodology. Aiming at developing a national profile for each member state of the European Union, it was necessary to focus the research on different layers where information was to be sought. These information layers were categorised in three levels.

On the European level – The context

First, with a top-down approach (or outside-in), by examining the European level or International context in which European countries co-exist. The purpose was to identify the current state of the European and national context, through basic demographic facts. Thereafter, it was possible to develop a first layer of the research's database, with every EU28 member state. The sources were primarily statistics and demographics from Eurostat (EUROSTAT, 2013), and reports about national systems of education and higher education by OECD (OECD,2012) and the European University Association (EUA), especially the EUA Public Funding Observatory (EUA,2014).

On the National level – The HE sector performance

Having realised the challenging number of the European member states, the next step was to develop a database for each one. The purpose was to develop the necessary layers of information in order to achieve the aim of having twenty eight national profiles, about higher education, universities' performance and the contribution of university real estate – facilities.

The first goal was to identify and frame the HE sector of each member state, retrieve the list of the HEIs that comprised it and focus on the selected scope (3rd cycle, doctoral education and public universities). At the same time, information relevant to the performance of the HE sector was collected, mainly on a national scale, with aggregated data about total student enrolment, participation in HE, academic or teaching staff, support or administrative staff and the available financial resources. Obviously the amount and quality of information from country to country differed, but it allowed for its registration and therefore the development of a first layer describing the performance of the national HE sector.

The sources where information was retrieved from were primarily governmental; national statistics, the responsible ministry

of education and in many cases the ministry of finances. In many countries, further information was provided by other official sources relevant to the HE sector, such as national rector's councils and HE quality assurance organisation and finally –and less often- by organisations or companies responsible for the management of university property. Finally at the end of this stage a list of the universities of each national HE sector was created.

On the university level – development of KPIs

That list was the basis for further web-research. Every selected university was researched through its official site. To cope with language barrier a web browser with automatic translation was used when necessary. Many of the universities provided their basic performance indicators in a specific domain, where in most of the cases was named "facts and figures".

Again, there were many differences from country to country regarding the richness of facts under these domains, whenever they were provided there. Another observation is that many universities provided basic information in domains where they presented their history, and their mission and vision. Thus, it can be said that most widely available fact was of course that of the student enrolment, supported with figures about gender ratios, enrolment to scientific fields, and more rarely graduation rates.

On the other hand there was a considerable information shortage regarding, the employees of the university, its budget, its income stream and expenditure structure as well as about its facilities. Of course, this can be said in comparison to the information available for the universities' students. Thereafter, browsing and research each university one by one, the acquired KPIs were registered in a second layer, where the information at a university level was stored. At the end of this stage, it was possible to aggregate that information and develop KPIs describing the general performance of these universities.

In order to cope with shortage of information, the first way was to seek further information in additional policy, strategic and management documents (such as multy-year development plans or annual financial statements). Whenever it was possible to translate these documents, the extracted information was registered in the university's database. In some cases it was even possible to acquire more detailed information, stemming out of reports about specific projects, increasing the insight on issues like the functional mix (% of accommodated functions), also about capital expenditure for facilities, and development , operating and maintenance costs.

The second way was to relate available information to the student population, which used as a denominator in new KPIs describing the relation of Teaching Staff, Financial Resources (total expenses) and the Gross Floor Area (GFA) of the university facilities. Therefore, it was possible to get to an average value for these KPIs at the end of the analysis at the university level, and thereafter use and compare it with the KPIs of the previous stage, the analysis at the National level.

Validation of information

From this point and on, it was possible to follow a bottom-up path, comparing, assessing and evaluating the information from the level of universities, to the level of the national HE sector, and finally use the information to develop a national profile with similar KPIs for each country. Therefore, complete the database originally developed to register demographics, with similarly treated KPIs regarding HE and university facilities. The following table briefly describes that methodology, corresponding to the different levels, from which information was collected.

Focus on level	Sources	Purpose
European & National	Eurostat, OECD, EUA and other international organisations	▪ Identification of the current European and national context, analysing demographic data. ▪ Development of EU28 database, population, GDP, GDP % for education and HE education.
National	Government statistics Ministries for education, Organisations and Councils for Higher Education	▪ Development of Country's Database. ▪ Identification of HE sector KPIs; students, staff, funding. ▪ Registration of information and sources in a "National level" layer. ▪ Identification of Universities; list of focus institutions.
University	"National level" Official University web-sites	▪ Registration of identified universities in a "University level" layer. ▪ Browsing official university sites. ▪ Facts & Figures, Policy documents (Financial reports, Strategic & Development plans). ▪ Registration of available information (KPIs) per university; students, staff, funding, facilities. ▪ Aggregation of university KPIs (sum and average figures).
National	Registered information at "University level"	▪ Verification of information. ▪ Comparison, assessment and evaluation of KPIs from 2 levels. ▪ Development of KPIs on national level relevant to the research focus.
European & National	Country's Database	▪ Registration of national profile to EU28 database ▪ Allowing comparison between member states

Guide to the reader

Figure 3.
Example of an introduction image of each member state,from the Netherlands.

Photograph

Each Country Profile contains one image of the member state's capital city, only with a couple of exceptions. The purpose is to provide a memorable impression of the -urban if possible- qualities of the nation's capital.

This impression preferably depicts both the history as well as the contemporary state of the city, through the perspective of an iconic location, monument or a "feeling" in general. The goal is to enable the reader develop an understanding of how it would probably feel like, being in a city hosting one of the universities.

Figure 4.
Example of a web-map developed to depict the location of the analysed universities of each member state.

Map

For each member state a web map was created, where every researched university was geo-coded to its actual location. By visiting the provided web-address the reader may have a virtual overview of each university's campus.

Demographics

The demographics for each member state of the European Union provide an overview of the national context, of which Higher Education is a part of it.

Three indicators, Population, Surface and Gross Domestic Product (GDP), provide information about the size and economic capacity of each member state in 2011. A fourth indicator, GDP for Education expresses the annual expenses for all grades of education as a percentage of the GDP. This information concerns 2009, at the beginning of the financial crisis, and was retrieved from Eurostat in 2012.

Student mobility and internationalisation

The information about student mobility and the internationalisation of each sector, are based on data from OECD, from the publication Education at a Glance 2012, and was retrieved in 2012. The original data set, Table C4.7., provided information about the number of foreign students in tertiary education, by country of origin and destination (2010), and market shares in international education (2000, 2010) (OECD, 2012). The research categorised the information concerning the EU member states, as both countries of origin of and destination for foreign students and it focuses more on the incoming students per EU member state. seven EU member states were not part of the OECD data set, and therefore the EU 28 average values are used as indicators for them.

Based on this information, three graphs are developed per EU member state, as a first set of indicators concerning the attractiveness of each EU member state HE sector. In other words, as an indicator of the demand for the provided HE education. The first one(top-left) provides information for the incoming and outgoing students, in the inner circle, whereas in the outer circle the continent of origin is presented as a percentage of the total incoming students. The second one (bottom-left) presents the internationalisation of the HE sector, as a ratio of the total incoming students and the total estimated students enrolled in it. Finally the third one (bottom-right) presents the market share of the HE sector, concerning European student mobility, as a percentage of the incoming students in the specific country versus the total incoming students in the EU 28.

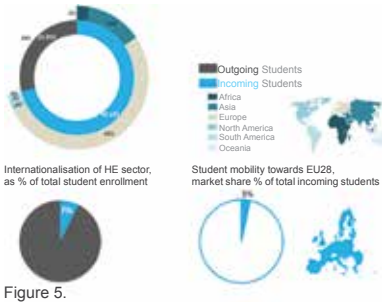


Figure 5.
Example of student mobility and internationalisation graphs, from the Netherlands.

Ranking of Universities

The ranking of universities can be used as an indicator of the provided HE per university individually. Moreover, aggregated it can also be used to indicate the state of the provided HE in a national scale.

In this research, information about universities' ranks was obtained from QS World University Rankings in 2012 and concerns the university rankings of the period 2012-2013 (IU.QS.com, 2013). The specific source was used due to the availability and usability (excel file) of the information. It should be mentioned that other international ranking methods exist, which can be used for this purpose, such as Times Higher Education; World University Rankings and Academic Ranking of World Universities, and most recently, U-Multirank.

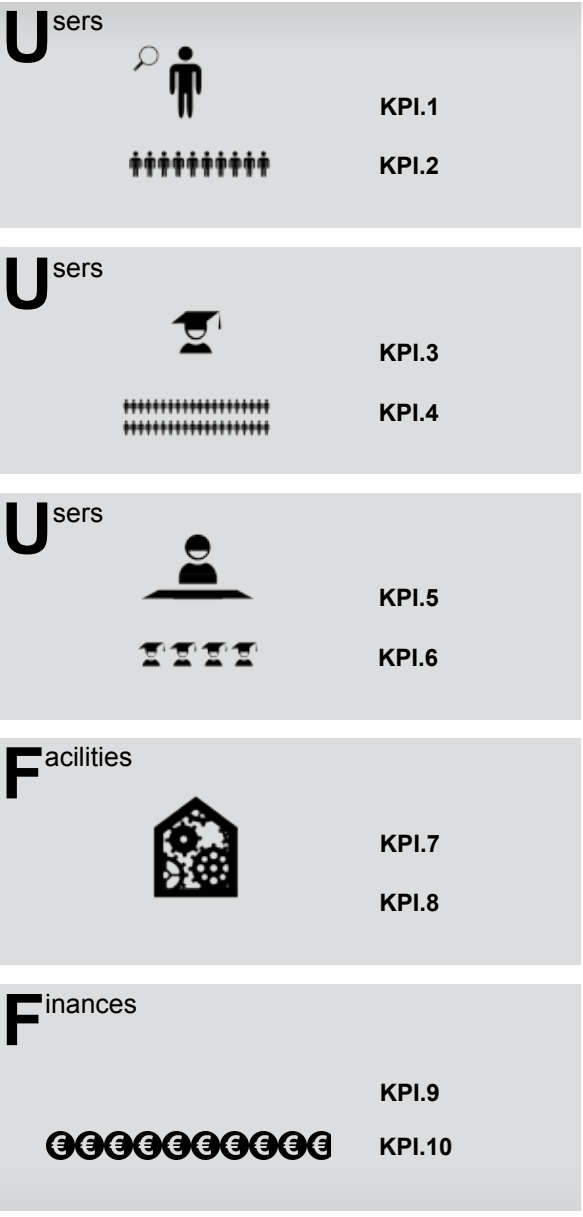
At a glance, the methodology used by QS World University Rankings to calculate the rank of each university comprises of six criteria, with the following corresponding weights. Academic Reputation (40%), Employer Reputation (10%), Student-to-faculty ration (20%), Citations per Faculty (20%), International Faculty ratio (10%) and International Student ratio (5%). It becomes clear that these criteria assess the competitiveness, teaching capacity and scientific productivity of each university. Being a product of an organisation focusing on the specific purpose, this information is regarded as supportive to the research, and is considered valid.

Rankings of national Universities

Universities ranked among the top 600 in the world
Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
62	University of Amsterdam
75	Leiden University
85	Utrecht University
99	Erasmus University Rotterdam
103	Delft University of Technology
107	Maastricht University
109	University of Groningen
136	Radboud University Nijmegen
158	Eindhoven University of Technology
161	Wageningen University
177	Vrije Universiteit Amsterdam
224	University of Twente
401-450	Tilburg University

Figure 6.
Example of the list showing university rankings, from the Netherlands.



Collection and management of information

The first three sets of KPIs provide information about the main (internal, in organisational terms) user groups of university facilities, and represent the demand for different typologies of space(functions and functional mix).

Students

The first user group are the students of universities, which is the biggest of the three. The KPI.1 expresses the total number of students retrieved during the research on the selected universities(University level) . In most of the cases universities provided information about their student enrolment per academic year. In most of the cases the number provided referred to student headcount, whereas there was rarely a categorisation between headcount and FTE students. Therefore the indicator refers to the total annual student enrolment.

The KPI.2 expresses the percentage of the students enrolled in the researched universities versus the estimated total enrolment in the national higher (or tertiary) education sector, and results from the comparison of information collected from different sources and of different levels (National level and University level). In terms of typologies of space, students are accommodated and /or use primarily all of the provided university facilities but office space.

Academic Staff

For this research, Academic staff refers to the university employees that are responsible for Education (teaching students) and Research. During the research, many terms and categorisations were observed, varying from country to country, especially when seeking information on a national level. For Example in France, where four categories existed: Professors, Lecturers and Assistants, Second Degree Teachers and Non-permanent Teachers. Moreover, in some cases especially when researching each university, Academic staff was given as FTE employees or as a headcount. It was hard to assess the actual rate of Total Academic staff / FTE Academic staff. This can be solved by examining universities that have a valid and precise record based on this categorisation, and thereafter use that ratio to observe KPI.3, which refers to an estimated total number of Academic Staff.

KPI.3 is dependent on KPI.1 and KPI.4. The latest , This is simple measure of the number of academic staff employed for

every student enrolled. In the absence of an international standard by which to measure teaching quality, it provides an insight into which universities are well equipped to provide small class sizes and a good degree of individual supervision (QS World University Rankings, 2014). This indicator was developed only through the research on the university level, whenever it was possible to have it per researched university. Thereafter, the resulting average value was used, describing the relation of a the same sample (selected universities). In terms of typologies of space, Teaching staff are accommodated and /or use all of the provided university facilities, besides maybe residential , conducting their job primarily in spaces for teaching and research as well as in offices.

Administrative Staff

For the research, Administrative staff refers to the university employees that are responsible for administrative and support tasks, necessary for the day-to-day functioning of a university. During the research, the availability of this indicator follows the same pattern of teaching staff. Two differences; the first one is, that there were less cases where administrative staff was broken down into further categories, and the second one is that compared to teaching staff, information about administrative staff was even more scarce.

The exact same methodology employed for Teaching staff, was used to develop KPI.6 and thereafter estimate KPI.5. Besides calculation purposes, KPI.6 may indicate the workload share, for administrative work that could possibly be accomplished by both employee groups. In terms of typologies of space, Administrative staff are accommodated and /or use primarily all of the provided university facilities, conducting their job in spaces for teaching and research as well as in offices. In terms of typologies of space, Administrative staff are accommodated and /or use mainly part of the provided university facilities, conducting their job primarily in office space.

Facilities

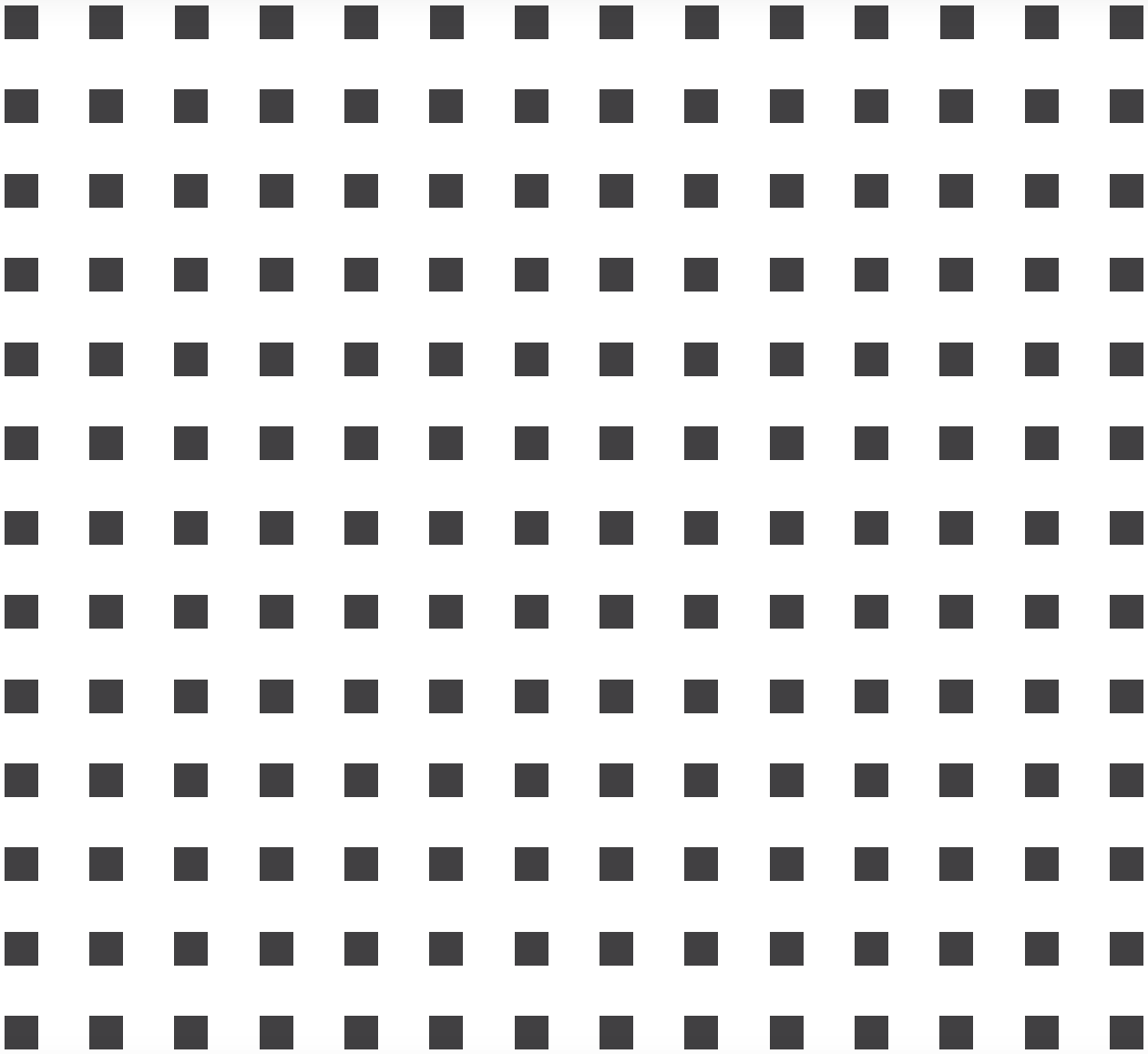
University facilities are the primary focus of this research. The research addresses them through an integrating approach as described in the introduction. In order to analyse them, the first concern was to develop an understanding about the size of the European universities' portfolio. During the research, the availability of relevant information varied a lot. Next to that, in most of the cases that information was provided without further definition, such as GFA (gross floor area) or UFA (usable floor area) –terms used in the Netherlands- or GIA (gross internal area) – used in the United Kingdom. Information regarding the total square meters of built university facilities was treated as GFA.

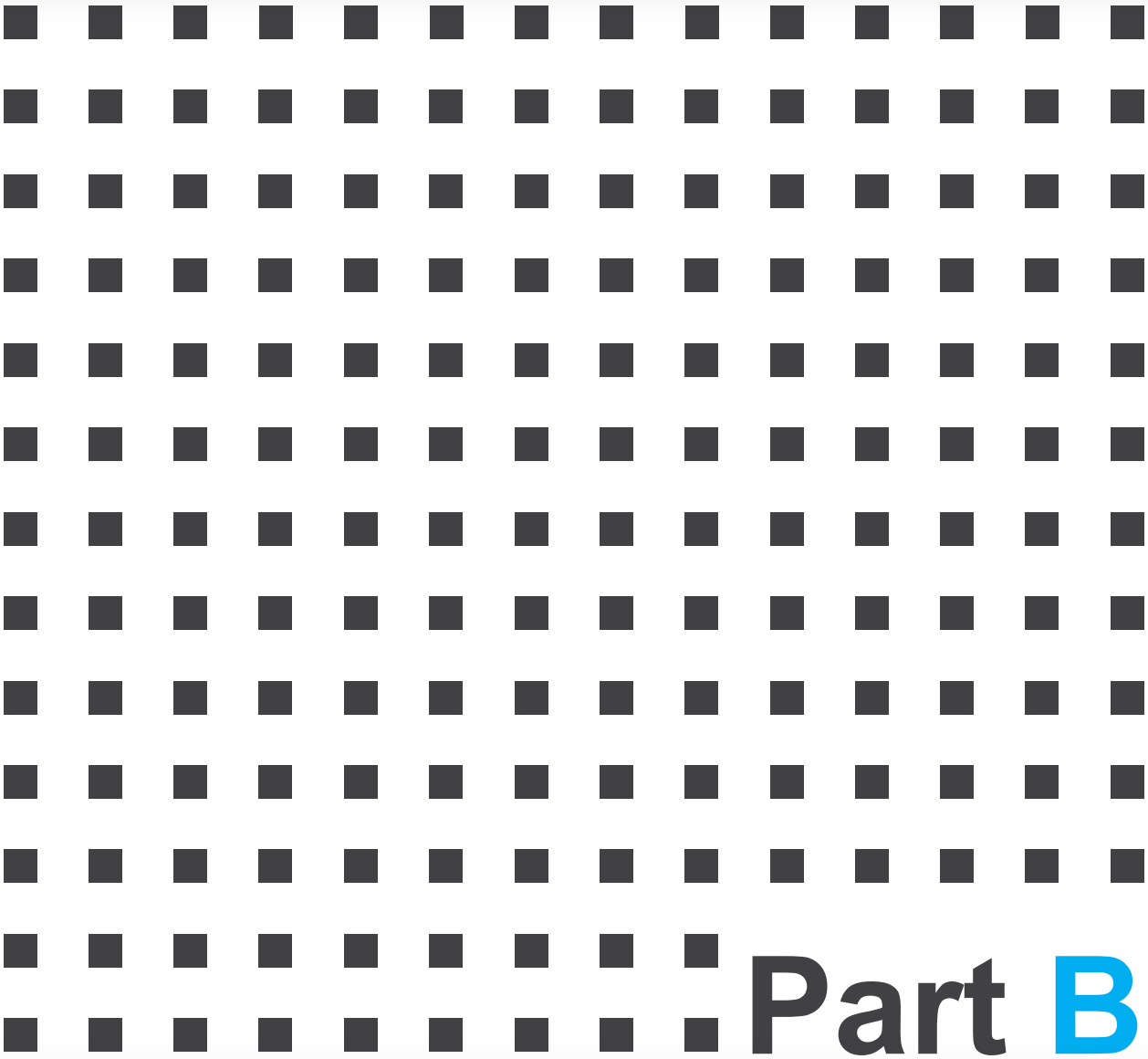
For every member state analysed, the retrieved GFA per university was related to its student population, developing KPI.8, the assignable GFA per student. Thereafter, a national average was calculated and used to estimate the sector's potential total size of university facilities, presented with KPI.7, the estimated GFA square meters. Occasionally, it was possible to acquire further information regarding facilities, like their age, their condition, the accommodated functions (%, as the functional mix), energy costs and energy consumption, operating costs as a percentage of the budget or in some cases investment costs for new constructions or refurbishment. However at this stage, the research focuses on a European comparison, therefore the basic KPIs to be used are the total size and the "spaciousness" of facilities.

Finances

For the research finances of the universities represent their financial capacity. During the research, the annual expenses of universities was regarded as the most appropriate indicator, showing the actual allocation of resources and the relevant performance (for example in rankings, or looking at the university staff and facilities) based on internal organisation decisions, rather than contextual dependencies (e.g. income streams from public sources).

Again, for every member state analysed, the retrieved annual expenses per university were related to its student population, developing KPI.10, the annual expenses per student. Thereafter, a national average was calculated and used to estimate the sector's capacity to finance its –current- performance, presented with KPI.9, the estimated national annual expenses for universities. For a more in depth analysis, finances of universities should be addressed from the perspective of Financial Sustainability, as suggested by EUA's work and policy areas.





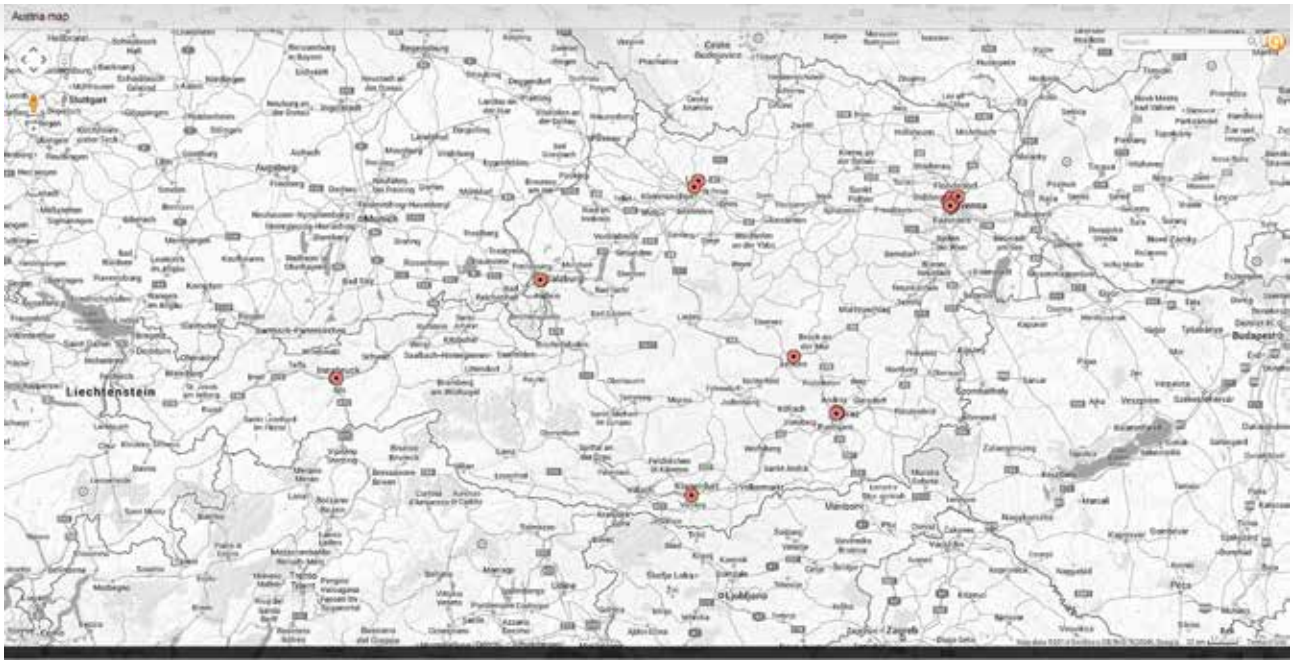
Part B

Country Profile: Austria

Austria, Vienna.
Source: Austrianzimmers.com. 1 May 2014.
http://www.austrianzimmers.com/news/article/111

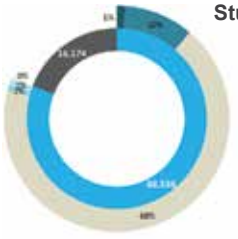
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	8,44	83.870	€ 301	6,0

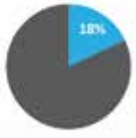


Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment



Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
160	Universität Wien
274	Technische Universität Wien
276	Universität Innsbruck
373	Karl-Franzens-Universität Graz
451-500	Johannes Kepler Universität Linz (JKU)

28 member states of the European Union

Country Profile: Austria

Users

300.000
Students

79% of the est.
higher education enrollment

Users

21.429
est. Academic Staff

14 students
per academic staff

Users

11.905
est. Administrative Staff

1,8 academic Staff
per administrative Staff

Facilities

est. 3.600.000
m^2 GFA

12,0 m^2 GFA
per student on average

Finances

€ 4.405 min.
est. Annual Expenses

€ 14.682
av. annual expenses
per student

Since the introduction of the University Law in 2002, Austrian HE sector comprises of Universities (public and private, since 1999) and Universities of Applied Sciences (Fachhochschule) (Kottmann, 2008). In 2012/13, 284.455 Austrians and 88.440 foreign students were studying at the Austrian HEIs; 220.960 Austrian students were enrolled at 21 public Universities ,35.481 at 19 Universities of Applied Sciences and 4.443 at 12 private universities.

A 25% of public universities' and a 39% of private universities' students are foreigners (Statistics Austria, 2014). During the research, 301.730 students were counted in 21 public universities and the Danube University Krems.In the past thirty years there was a steadily growing student population. However the introduction of general tuition fees in the winter semester of 2001 resulted in a sharp decrease of 20% in student numbers.

Between 2010 and 2012, student enrollment grew by 6% from 350.247 to 372.895 students in total (Statistics Austria, 2014). In 2012/13 public Universities employed 35.506 persons as academic staff; of them, 2.333 were professors and 33.173 were other "science and arts" staff (Statistics Austria, 2014). Based on the analysis of public universities' figures during the research, this number could be attributed to the sum of the staff employed.

In 2010 the total public expenditure for the Austrian HE sector was €4,7bn, with €4,6bn for the university sector and €83min for the non-university sector (Statistics Austria, 2014). The total public expenditure for the Austrian universities was almost doubled between 2000 and 2010, from €2,5bn to €4,6bn (Statistics Austria, 2014).

Based on the available information retrieved from the public universities' official sites, the assignable built space per student ranges from 3,8 to 25,8 square meters, being 12 square meters on average. Thus the total built surface used is estimated at 3,6min square meters. In Austria, BIG owns and manages the facilities of seven universities, a portfolio of 400 objects and 1,6min square meters of built area (BIG, 2013).

Vienna University of Technology (TU Wien) spends annually €30min for its space (TU Wien, 2014) Thus, with 276.000 square meters of gross floor space (TU Wien, 2014) it is possible to acquire an indication of the total cost of ownership per square meter, which stands at €108. Moreover the total cost of ownership accounts for around 13% of the university's

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	8,44	83.870	€ 301	6,0

budget. Currently TU Vienna consolidates its position in four locations within the city of Vienna, executing the project TU University 2015 (TU Wien, 2014); "*The top project goal is the creation of optimal basic conditions for those who study and work at the TU Vienna. Therefore, the main points of the project have been set up on topics such as accessibility, sustainability, art/culture, and corporate identity*" (TU Wien, 2014).

Another interesting project from Austria concerns the campus of the Vienna University of Economics and Business. This campus consists of six building designed by renowned architects, where the most prominent example is the Library and Learning center by Zaha Hadid. The campus was developed in a plot of 90.000 square meters, providing 100.000 square meters of utilised area for 25.000 students, providing 4.500 teacher workspaces and 3.000 student workspaces, at a total investment cost of €492 min (VASKO + Partner, 2014).

During the research it was possible to retrieve quantitative information about the campus of 8 Austrian universities. The assignable space per student ranged from 5,7 to 25,6 square meters. On average, the same indicator was calculated as 12,2 square meters per student.










The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Belgium

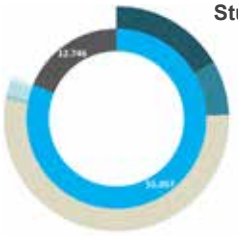
Belgium, Brussels.
Source: Kovshenin, K. Blog.utrip.com. 1 May 2014.
http://blog.utrip.com/brussels-travel-plan/#.U2JP94ZmhcY

28 member states of the European Union

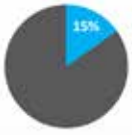
Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	11,04	30.528	€ 370	6,6

Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment



Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
82	Katholieke Universiteit Leuven
127	Université Catholique de Louvain (UCL)
148	University of Ghent
172	Université Libre de Bruxelles (ULB)
189	Vrije Universiteit Brussel (VUB)
196	University of Antwerp
239	University of Liege

28 member states of the European Union

Country Profile: Belgium

Users

200.000
Students

56% of the est. higher education enrollment

Users

26.316
est. Academic Staff

8 students per academic staff

Users

10.526
est. Administrative Staff

2,5 academic Staff per administrative Staff

Facilities

est. 1.960.000
m^2 GFA

9,8* m^2 GFA per student on average

Finances

€ 1.660 min.
est. Annual Expenses

€ 8.300
av. annual expenses per student

Belgium is characterized by the co-existence of the Flemish and the French community. Thus, the HE sector was analysed accordingly. In 2003, the structure of HE in the Flemish Community has been reformed to comply with the Bologna Principles. It comprises of 7 Universities and 22 University Colleges (Hogescholen). In 2007/08, 64.372 students were enrolled at the universities and 104.174 students at the University Colleges, with a total of 168.564 students enrolled in the Flemish HE sector (O&O Monitoring, 2009).

In 2007, Flemish universities employed, 18.542,6 FTE staff or 22.997 persons. These figures include on the one hand the academic faculty (ZAP-13,7%), the assistant academic staff (AAP-9,6%) and the administrative and technical staff (AT-Pwu-20,8%) financed by the Ministry of Education, and on the other hand the scientific staff or researchers (WP-41,6%) and the administrative and technical staff (ATPbwu-14,8%) paid from other financial sources (O&O Monitoring, 2009).

In 2007 the Flemish HE sector was financed with €1,88bn of which €1,08bn was allocated for the universities. For the same year, the universities' budget may be broken down in: the Teaching and Research Grant to Universities (64%), the Second Research Block Grant to Universities (10%), research funds from the Fund for Scientific Research -FWO- (17%), the Innovation Block Grant to Universities (2%) and Tuition Fees (2%). In 2007 the Flemish government further provided funding for real estate and equipment investment which accounted for 5% of the total budget (O&O Monitoring, 2009).

The HE sector of the French Community comprises of Universities and HEIs (other than university institutions) that offer professionally-oriented programmes. In 2007, the 9 (7 as per 2013) universities belonged in one of the three University Academies (the Academy of Louvain, the Academy of Wallonia-Brussels, the Academy of Wallonia-Europe) (O&O Monitoring, 2009) .

In 2007/08 around 67.000 students were enrolled at the Universities and 83.000 students in the remaining HEIs. Universities employed 1.880 FTE Academic staff, 1.955 FTE Scientific staff and 3.851 FTE Administrative, Technical and Managerial staff. In 2008, the budget for the HE sector of the Wallon region was €1,15bn, of which €712mln were allocated to the Universities and €439mln to the HEIs. Between 2000 and 2008 the total expenditure for the Wallon universities grew from €540mn to €712mn (O&O Monitoring, 2009). Based on the Belgian Universities' figures retrieved during

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	11,04	30.528	€ 370	6,6

the research, in 2013 there were 196.000 students enrolled in both the Flemish and the French speaking part of Belgium.

During the research it was not possible to retrieve quantitative information regarding the educational facilities of the Belgian Universities. For this reason and for the purposes of estimating a total gross floor area of the Belgian universities, the average assignable square meters per student -as a research result- has been used, and is highlighted with an asterisk (*).










The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

Country Profile: Bulgaria

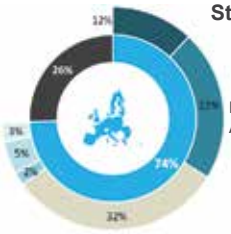
Bulgaria, Sofia.
Source: Wikimedia.org. 1 May 2014.
http://upload.wikimedia.org/wikipedia/commons/1/11/Party_House_by_night%2C_Sofia_%28by_Pudelek%29.JPG

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	7,33	110.910	€ 38	4,6

Student mobility & Internationalisation

source: **OECD**,2012



EU 28 Average

Internationalisation of HE sector, as % of total student enrollment

Student mobility towards EU28, market share % of total incoming students

EU 28 Average

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
600+	Sofia University “St. Kliment Ohridski”

28 member states of the European Union

Country Profile: Bulgaria

Users

220.000
Students

79% of the est. higher education enrollment

Users

9.016
est. Academic Staff

24 students per academic staff

Users

5.635
est. Administrative Staff

1,6 academic Staff per administrative Staff

Facilities

est. 1.518.000
m^2 GFA

6,9 m^2 GFA per student on average

Finances

€ 330 min.
est. Annual Expenses

€ 1.500
av. annual expenses per student

In Bulgaria, higher education is provided by Universities, Specialised Higher Schools (Spetzializirano Visshe Uchilishte) and Colleges (Euro Education, 2005). Based on the information provided by the Bulgarian Ministry of Education and Science in 2014, there are 51 accredited HEIs in Bulgaria (Minedu.government.bg, 2014). From the ministry's section for ranking the universities of Bulgaria, 37 state and 14 Private Universities were identified (RSVU, 2013).

Bulgaria was one of the countries that information regarding student enrolment was considerably less available in the official web-sites of the universities. While on average 84% of the analysed universities provided basic information about their student numbers, more than half of the Bulgarian state universities and even less of the private universities provided such information. Thus, in 18 public universities 127.967 students were counted, while in 5 private universities only 14.600. In order to increase the research's insight about the students of the Bulgarian HE, a review of the country's HE system dating to 2004, from a report developed by the Higher Education Policy Institute, has been used.

In 2004, Bulgaria was characterised by HEIs of small size. In fact, out of 51 HEIs, only 10 had more than 10.000 students, while 32 had less than 5.000 and 17 had fewer than 1.000 (Bekhradnia, 2004). In 2004, the Bulgarian HE sector educated around 220.000 students (Bekhradnia, 2004). On one hand, at this period growing student demand for HE was anticipated, but on the other hand, a demographic downturn was also forecasted for the next two decades (Bekhradnia, 2004). Hence, ten years later, a relatively unchanged student population could be assumed. In 2004, there were 22.250 staff employed in the HE sector, resulting in a 1:10 staff to student ratio. This ratio was characterised as low, indicating an over-staffed sector.

However, at the same time it was an already ageing sector (Bekhradnia, 2004). At the same period, one of the main financial challenges for the Bulgarian HE sector was twofold; first, low public investment on HE (0,6% of the country's GDP) and at the same time, the allocation and use of the available financial resources was rather inefficient (Bekhradnia, 2004).

In terms of university facilities, the Sofia University "St. Kliment Ohridski" uses a historic building in the city of Sofia, dating back to 1880, with a surface of 10.200 square meters, the quality of which is also used to promote the corporate image of the university (Uni-Sofia.bg, 2008). The University

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	7,33	110.910	€ 38	4,6

"Angel Kanchev" in the city of Rousse, uses 67.490 square meters in total, of which more than 13.000 (20%) were built at the university's second campus, and put to operation in 2010 (Uni-Ruse.bg)With the university established 69 years ago, it is expected that the remaining 80% of its facilities would be in need of reinvestment in the following years.









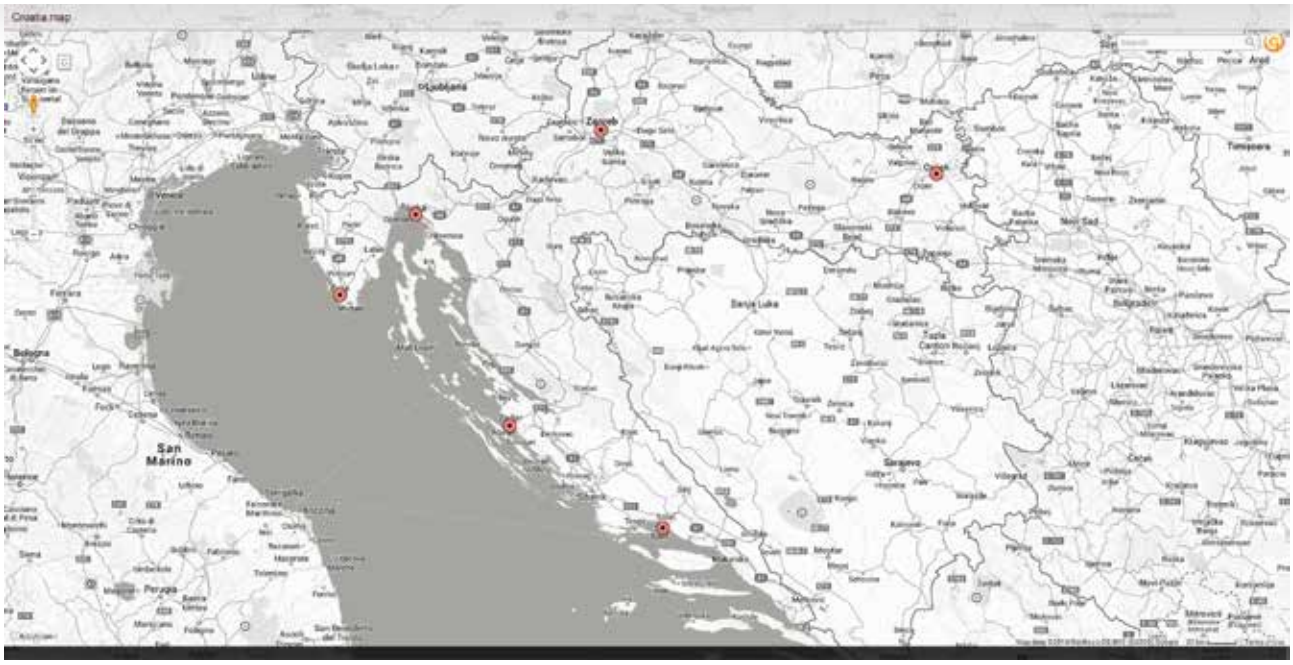

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

Country Profile: Croatia

Croatia, Dubrovnik.
Souce: Charterworld.com. 1 May 2014.
http://www.charterworld.com/index.html?sub=dubrovnik-yacht-charter-croatia

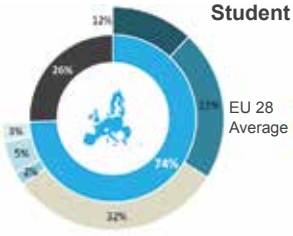
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km²)	GDP (bn Euros)	GDP for Education (% of GDP)
	4,28	56.694	€ 79	4,3



Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
550-600	University of Zagreb

28 member states of the European Union

Country Profile: Croatia

Users

150.000
Students

67% of the est. higher education enrollment

Users

8.108
est. Academic Staff

19 students per academic staff

Users

4.054
est. Administrative Staff

2,0 academic Staff per administrative Staff

Facilities

est. 570.00
m^2 GFA

3,8 m^2 GFA per student on average

Finances

€ 176 min.
est. Annual Expenses

€ 1.175
av. annual expenses per student

The Croatian HE is regulated since 2003 by the Act on Scientific Activity and Higher Education. A binary system was established in which provides two types of education, academic and professional, in both public and private HEIs. Academic education is solely provided by 10 Universities (Sveučilišta), while professional education is provided by 15 polytechnics (Veleučilišta), 27 schools of professional higher education/ colleges (Visoke škole) and less often by universities.

Additionally there are 67 faculties and academies (as part of universities) which are legally recognised as separate and independent legal entities. While most HEIs are publicly owned, of them, 3 universities, 2 polytechnics and 24 schools of professional higher education are private (EACEA, 2010).

In 2009/10, more than 140.000 students were enrolled in the Croatian HE, 114.202 of them in universities, 22.034 in polytechnics and 9.027 in schools of professional higher education. In 2013, during the analysis of 7 Croatian public universities, 150.631 students were counted in total.

According to the data provided by the Central Bureau of Statistics (EACEA, 2010) in the academic year 2006/2007 Croatian HEIs employed 9.457 FTE professors and associate lecturers, while in the academic year 2009/2010, there were 11.459 FTE professors and associate lecturers (an increase of 21% in three years) (EACEA, 2010).

Between 2003 and 2007, around 70 % of Croatian HEIs' income was provided by the state budget, which in 2007 accounted to 0.86 % of the country's GDP. In the same period both state funding and the institutions' own income doubled, but the participation in GDP decreased (EACEA, 2010). Other sources of funding (the remaining 30%) are founders' funds, local authorities funding, National Science Foundation project-based funding, the institutions' own funds, tuition fees(38%) and donations (EACEA, 2010). Most of the Croatian HEIs' expenses are allocated to cover salary costs and other indirect costs, resulting in a limited amount of available finances for the HEIs to allocate at will (EACEA, 2010).

The four largest public universities in Croatia (Rijeka, Zagreb, Osijek and Split) account for over 70 % of all students in Croatia. The university of Zagreb currently concentrates its accommodation in the University Campus Borongaj, former barracks, where adaptation and renovation works took place before its opening in 2007. The campus covers 92.8 hectares , it is used by 35.000 students and is considered as one of

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	4,28	56.694	€ 79	4,3

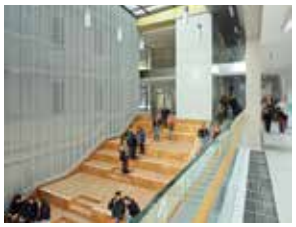
the biggest investments in Croatian education in the last 150 years (Unizg.hr, 2014). At the same time the university of Rijeka develops its own new campus (campus Trsat) since 2002, with phased planned works exceeding 2014, aiming at new facilities of increased standards that will enhance its overall performance (Uniri.hr, 2014).

Interestingly the Academy of Applied Arts is accommodated in a former military building, a neoclassical building of 1926 (Ožanić & Hero, 2014) Finally the university of Zadar is currently accommodated in a historic building, occupying more than 20.000 square meters in the city. However there are also plans for the development of a new campus with an estimated cost of €90mn between 2013 and 2017 (Unizd.hr, 2014).









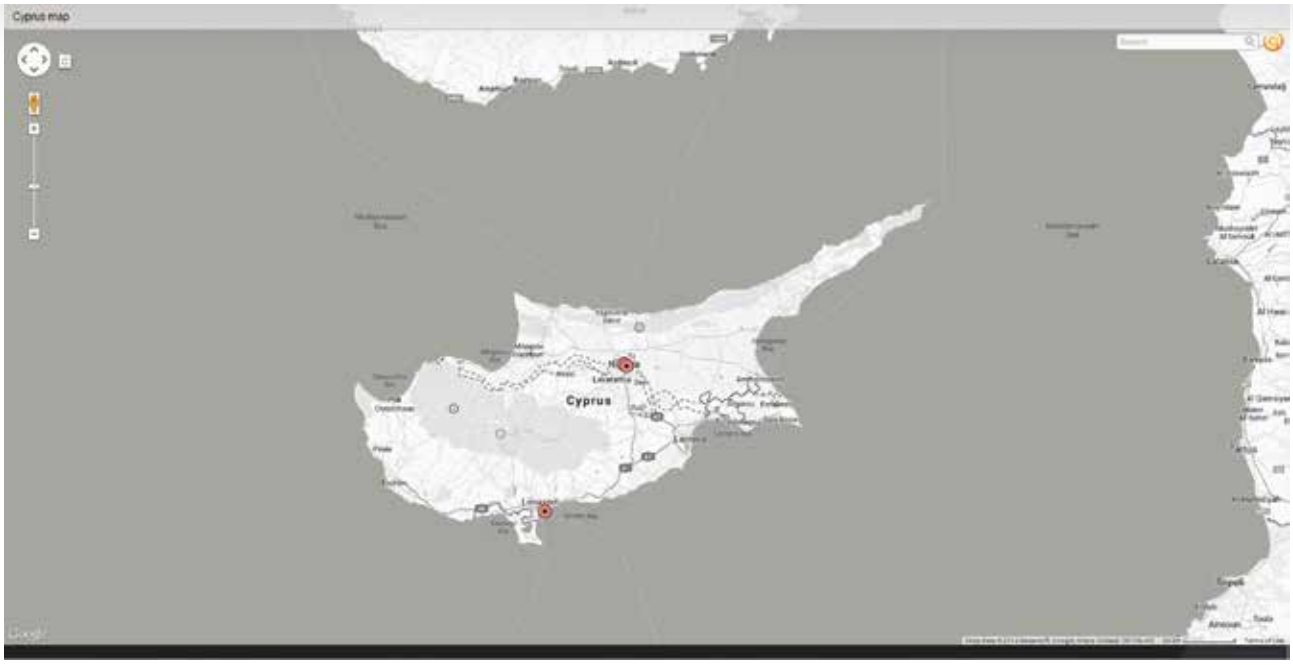

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Cyprus

Cyprus, Nicosia.
Source: Getintravel.com. 1 May 2014.
http://www.getintravel.com/nicosia-cyprus/1346997000000/

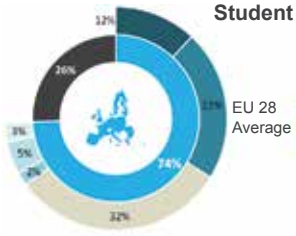
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	0,86	9.250	€ 18	8,0



Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University

28 member states of the European Union

Country Profile: Cyprus

Users

12.000
Students

39% of the est.
higher education enrollment

Users

800
est. Academic Staff

15 students
per academic staff

Users

800
est. Administrative Staff

1,0 academic Staff
per administrative Staff

Facilities

est. 142.800
m^2 GFA

11,9 m^2 GFA
per student on average

Finances

€ 22 min.
est. Annual Expenses

€ 1.800
av. annual expenses
per student

The HE sector of Cyprus is a relatively young system, which was characterised by the establishment of the first Cypriot university in mid 80s, the University of Cyprus. Higher and Tertiary Education is provided through "*a wide range of means and methods in public or in private institutions, through full-time, part-time, distance and other forms of attendance, in Universities and Institutions of Tertiary Education*" (Higher-education.ac.cy, 2014).

Currently, the majority of HEIs in Cyprus are private. There are 3 public and 5 private Universities, as well as 5 public Institutions of Tertiary Education and more than 35 private Institutions of Tertiary Education. Due to the establishment of new universities and HEIs next to the University of Cyprus, in the 2000s, The number of students in Cyprus has been increasing rapidly over the last fifteen years.

In 1995 more Cypriots studied abroad than these who were enrolled in a national HEI (9.213 versus 7.363). However, in 2009 the situation changed. For the first time more Cypriot students were studying in Cyprus, and less abroad (21.095 versus 20.051) (Highereducation.ac.cy, 2014).

In the same period, there was a significant increase in HE attainment , from 16.576 students in 1995 to 42.431 students in 2011. Moreover, the number of foreign students was considerably increased, from 1.511 in 1995 to 8.540 in 2011 (Highereducation.ac.cy, 2014). Because of the strong ties between Greece and Cyprus, many Cypriots chose to study in Greece. Next to that, in 2011Greeks were also half of the foreign student population of Cyprus.

That growth of the HE sector should respectively be followed by accommodation demands, as Cyprus lacked HE infrastructure. Due to lack of documentation regarding educational facilities projects, it is hard to provide facts about the campuses of Cypriot universities. It is only possible to mention that the university of Cyprus has developed a new campus.

The new University Campus is located on the outskirts of east Nicosia, between Aglantzia and Athalassa, and covers an area of approximately 1,2 square kilometres. The new facilities would host all faculties, departments, and teaching activities of the University (MBA.ucy.ac.cy, 2014)

"*An international architectural competition was held in 1992 for the design of the New Campus. The winning designs served as the basis for the final Master Plan, which was com-*

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	0,86	9.250	€ 18	8,0

pleted in 1994 and approved in 1998, at which time building commenced. The Master Plan conceptualizes the Campus in four distinct zones: public buildings, academic buildings, sports facilities, and student residences. Upon completion, slated for 2020, the Campus will accommodate up to 9,000 students" (MBA.ucy.ac.cy, 2014).









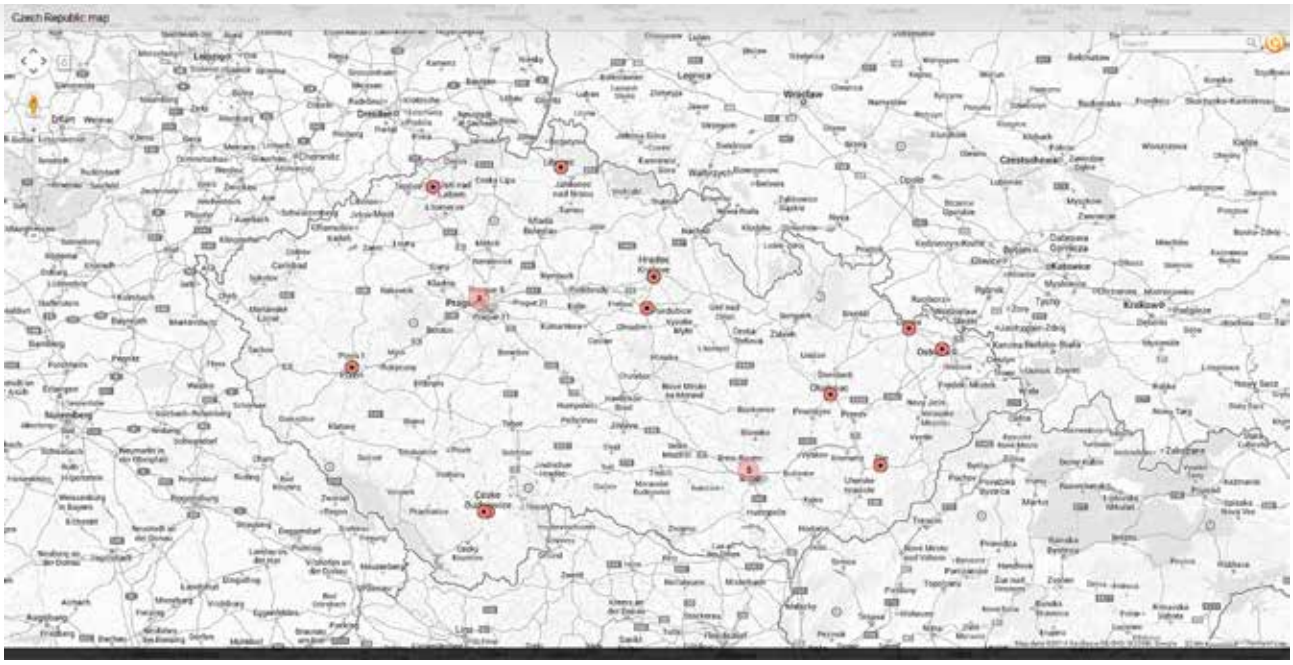

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

Country Profile: Czech Republic

Czech Republic, Prague.
Source: Ball, L. Lisaballtraveldesign.com. 5 February 2014. 1 May 2014. http://lisaballtraveldesign.com/charles-bridge-prague/

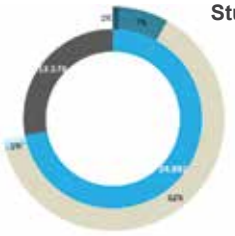
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	10,51	78.866	€ 156	4,4



Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
286	Charles University
501-550	Czech Technical University In Prague
551-600	Masaryk University
601+	Brno University of Technology

28 member states of the European Union

Country Profile: Czech Republic

Users

320.000
Students

84% of the est.
higher education enrollment

Users

23.881
est. Academic Staff

13 students
per academic staff

Users

21.710
est. Administrative Staff

1,1 academic Staff
per administrative Staff

Facilities

est. 1.600.000
m^2 GFA

5,0 m^2 GFA
per student on average

Finances

€ 1.335 min.
est. Annual Expenses

€ 4.171
av. annual expenses
per student

According to the Czech Ministry of Education, Youth and Sports, the Czech HE sector comprises of 26 public, 2 state HEIs and 45 private HEIs (Msmt.cz, 2014). In the Czech Republic the term “tertiary sector” is not yet defined in legislative terms.

It describes a HE sector which includes public, state and private HEIs that provide education for all 3 cycles of the EHEA Qualifications Framework. Moreover, it includes tertiary professional schools (providing tertiary professional education or, possibly, Bachelor degree programmes in cooperation with a higher education institution) and, finally, other institutions providing education leading to acquisition of a higher than secondary level of qualification (two-year studies at conservatoires following the secondary leaving examination) (Kopicová, 2010). The research focused at the 26 public HEIs (19 universities, 4 art academies, 2 institutions and a College of Polytechnics).

In 2007, there were 348.610 students in the Czech HE sector (Beneš & Roskovec, 2009). There were 303.731 students enrolled in the 26 public HEIs, 3.940 in the 2 state HEIs and 40.939 students enrolled in private HEIs (Beneš & Roskovec, 2009). In 2013, during the research more than 320.000 students were counted in the 26 public HEIs (unavailable information from 5 institutions) (Beneš & Roskovec, 2009).

The Czech student body might experience a negative growth in the future, mainly due to the drop in birth rates observed between 1990-1996. In 2007, pubic HEIs employed 18.030 FTE academics and 12.335 FTE administrative staff. In total, there were 30.365 FTE staff, 17% more compared to the year 2000 (Beneš & Roskovec, 2009).

Regarding the financial resources of the Czech public HEIs, their funding was increasing from 2000 until 2007. In 2000 total funding accounted for CZK 22.654 min and in 2007 it was almost doubled to CZK 40.163 min. State participation was 80% in 2000 (0,7% of GDP) and 76% in 2007 (0,9% of GDP), while for the same period, income from private sources increased by 67% (Beneš & Roskovec, 2009). Since 2009 Performance Based Funding was introduced, aiming at shifting the HEIs’ funding formula from their input to their output (Koucký, n.d.).

In December 2011, the Czech parliament –in response to the financial crisis- suggested a 20% reduction of the education budget until 2014, through a three-year saving plan

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	10,51	78.866	€ 156	4,4

(Koucký, n.d.). Austerity measures resulted in the opening of a debate regarding the introduction of tuition fees for public HEIs (Koucký, n.d.).

Information about the universities' campus was available only for the country's leading university, Charles University in Prague, retrieved from its General Development Plan 1997-2020. In 2008, for more than ten years the university invested in total CZK 7bn, of which more than CZK 2bn of own resources (Cuni.cz, 2008).

Around 60% of funds were spent on the reconstruction and rehabilitation of its infrastructure. Another 12% of the funds allocated for the acquisition of machinery , instruments and equipment (Cuni.cz, 2008). In many cases renovation and modernization works aimed also at protecting the historical heritage of the Czech Republic (Cuni.cz, 2008).

In 2008, the university used 243.000 square meters of academic space, next to numerous buildings in various locations besides Prague. Between 1994 and 2008 it is observed that because of the growth of students (63%) and a more moderate increase of academic space (23%), the assignable space per student decreased (from 6,6 to 5 square meters) (Cuni.cz, 2008), raising the issue of more space utilization.










The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Denmark

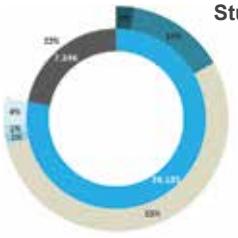
Denmark, Copenhagen.
Source: Podgorski, C. Mydestination.com. 10 May 2013. 1 May 2014.
http://www.mydestination.com/blog/coping-in-copenhagen/

28 member states of the European Union

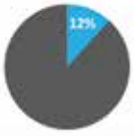
Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	5,58	43.094	€ 240	8,7

Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector, as % of total student enrollment



Student mobility towards EU28, market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
51	University of Copenhagen
89	Aarhus University
132	Technical University of Denmark
318	University of Southern Denmark
352	Aalborg University

28 member states of the European Union

Country Profile: Denmark

Users

160.000
Students

71% of the est.
higher education enrollment

Users

13.559
est. Academic Staff

12 students
per academic staff

Users

11.299
est. Administrative Staff

1,2 academic Staff
per administrative Staff

Facilities

est. 3.120.000
m^2 GFA

19,5 m^2 GFA
per student on average

Finances

€ 3.952 min.
est. Annual Expenses

€ 24.700
av. annual expenses
per student

Higher education in Denmark is free, besides some costs associated with students, such as books and teaching material. Danish HE programmes are categorized according to level and duration: the short-cycle higher education including, among other things, the vocational academy education, the medium-cycle higher education including the university bachelor programmes, the professional bachelor programmes and other medium duration higher programmes, together with the long-cycle higher education including master's programmes (candidatus) and PhD programmes (UNI•C Statistics & Analysis, 2010).

Following this categorization, there are various types of Danish HEIs; 8 Universities, 10 Academies of professional higher education, 12 University Colleges and Engineering Colleges, 14 Maritime Colleges, 19 Police and Defense Colleges, 32 Artistic and Cultural Colleges and 8 institutions with medium-cycle higher education (UNI•C Statistics & Analysis, 2010).

Between 2000 and 2008 student attainment of the Danish HE was relatively stable (slight increase of 5%), with a total of 199.465 students in 2008. In short-cycle higher education programmes there were 18.950 students, in medium-cycle higher education 127.186 and in the long-cycle higher education 53.329.

In 2010, the total number of students was 215.167 (UNI•C Statistics & Analysis, 2010). The analysis of the 8 Danish universities counted a population of 159.950 students in 2013, estimated as a 71% of the current total enrolment.

Compared to other countries, Denmark uses relatively many resources on education at all levels. In 2006, 15,6% of the total public expenditure was allocated to all levels of education and 4.4% for HE. The total funding (private and public) was 7,3% of the country's GDP, with 1,7% allocated to HE. In Denmark, private expenditure on education is far less than public expenditure (UNI•C Statistics & Analysis, 2010).

In Denmark, the public real estate company Bygningsstyrelsen is responsible for providing property management to the state's real estate. Regarding university campuses, it provides professional approach and insight in contemporary issues regarding strategic campus planning as well as a precise and coherent registration of the Danish universities' facilities, the physical condition of the campuses, the university's strategy and its campus strategy (Bygst.dk, 2014).

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	5,58	43.094	€ 240	8,7

Based on the report of Bygningsstyrelsen "Campus Development Method and Process" (Bygst.dk, 2013) the Danish university campus can be described by the following sentences.

"*The universities are expanding, and the building mass must keep up to ensure that there is enough space for more students and researchers.*

The objective is to create attractive universities that offer good physical settings for academic and social exchange. Campus and city merge.

The universities wish to improve their study environments and create life on campus – also after teaching hours. Dispersed localities mean dispersed activities, and the challenge is often to improve the university's identity and visibility.

Several universities therefore work on densifying their building mass as well as their activities, and they aim to involve the city and other knowledge institutions in the development of common environments" (Bygst.dk, 2013).









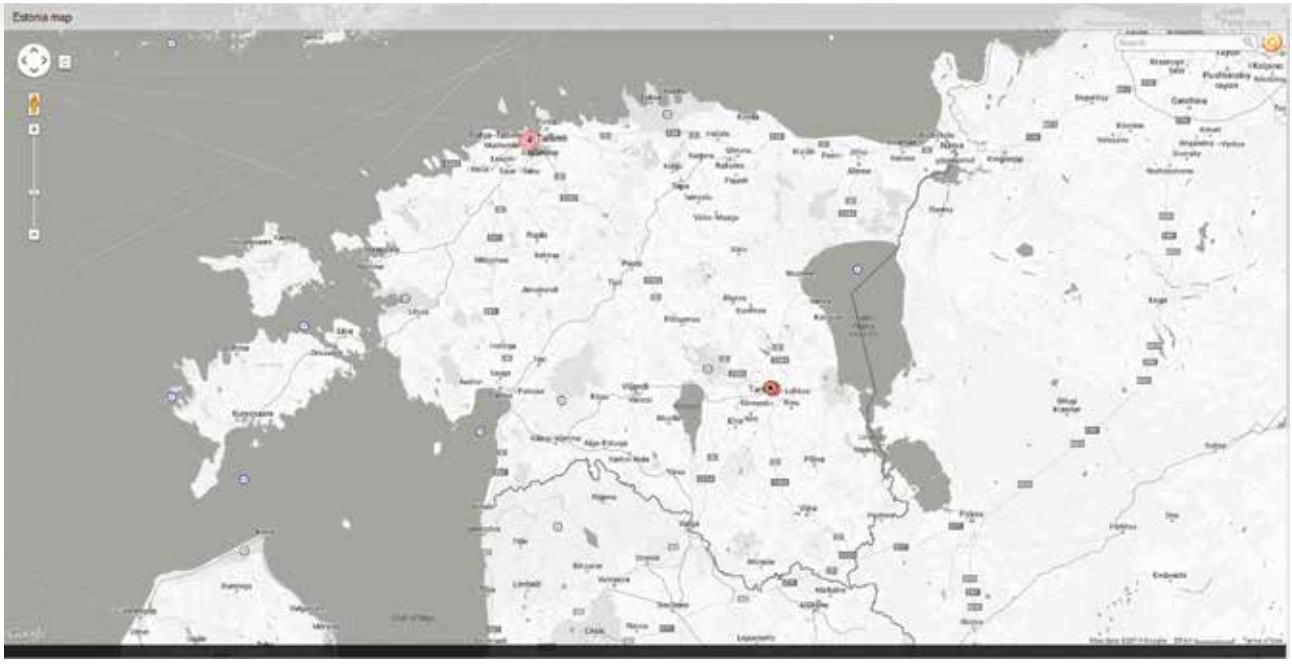
The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Estonia

Estonia, Tallinn.
Source: Ds-lands.com. 1 May 2014.
http://ds-lands.com/data_images/famous_places/tallinn-town-hall/tallinn-town-hall-03.jpg

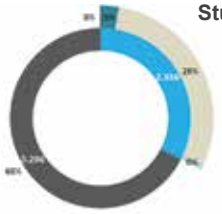
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	1,34	45.226	€ 16	6,1



Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
501-550	University of Tartu

28 member states of the European Union

Country Profile: Estonia

Users

49.000
Students

67% of the est.
higher education enrollment

Users

4.712
est. Academic Staff

10 students
per academic staff

Users

3.365
est. Administrative Staff

1,4 academic Staff
per administrative Staff

Facilities

est. 504.700
m^2 GFA

10,3 m^2 GFA
per student on average

Finances

€ 314 min.
est. Annual Expenses

€ 6.400
av. annual expenses
per student

The Estonian higher education system is binary and consists of universities (ülikool) and professional higher education institutions (rakenduskõrgkool).

In 2012, there were six state and one private universities, and nine state and eleven private professional higher education institutions(ENIC, 2012). Estonia's education system is largely supported by public funds. In 2009, 94% of education funding comes from public sources, compared to 84% on average in OECD countries.

For tertiary education, it stands at 80.2%. Regarding the crisis, with one of the highest percentages of public funding of education and the largest drop in GDP, Estonia recorded the largest decrease in state expenditure for every level of education, which was registers as 10% in only one year (2008 to 2009)(OECD, 2012).

Observing the statistics provided by Estonian ministry for education (HM, 2013) and comparing the total state educational expenses for 2008 and 2009, the difference is indeed negative but at the range of 1% (€837 million in 2008, €826 million in 2009).

Regarding the HE sector, between 2000 and 2011, it accounted on average for 20% of the state expenditure for education. In 2000, state expenditure for the HE sector was €82 million (18% of total state expenditure for education), reaching a peak in 2009 with €183 million (22% of total state expenditure for education). However, on the next year, 2010 state funding for higher education decreased by 9%, at €166 million (20% of total state expenditure for education) (HTM, 2014).

The student enrolment in Estonian HE sector was growing since the 1990s. From 1993 (25.000 students) to 2000 (more than 55.000) student enrolment was more than doubled. From 2001 to 2004 growth continued in a slower pace (60.000 to 70.000). However, since then, student enrolment ceased growing and was stabilised at these numbers, standing in 2010-2011 at 69.133 students. Academic and administrative staff can be described by the research KPIs based on the analysis of the six state universities (Tõnisson, 2011).

The same applies for the university facilities, but it is necessary to mention that the academic profile of the university (Music and Theatre) is related with facilities of specific requirements, usually bigger than these used for education and

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	1,34	45.226	€ 16	6,1

research. Therefore, the KPI (10,3 m2 per student) might not be realistic for the whole university sector. However, at this point of the research it was the only available not only for Estonia, but for all the Baltic states as well.

Finally, two Estonian universities addressed their real estate in terms of costs, in their balance sheets. For the Tartu University, the total expenditure for buildings was €234.816 in 2012 and for Estonian University of Life Sciences the residual value of buildings and constructions was €34 million in 2010.










The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

Country Profile: Finland

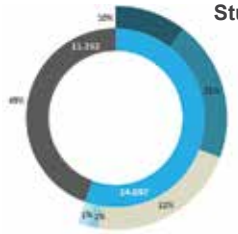
Finland, Helsinki.
Source: Nexttriptourism.com. 1 May 2014.
http://nexttriptourism.com/wp-content/uploads/2013/01/Helsinki-Beautiful.jpg

28 member states of the European Union

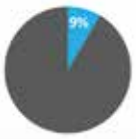
Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	5,4	338.145	€ 189	6,8

Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment



Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
78	University of Turku
211	Aalto University
222	University of Oulu
262	University of Eastern Finland
302	University of Jyväskylä
309=	University of Tampere
395	Abo Akademi University
401-450	

28 member states of the European Union

Country Profile: Finland

Users

165.000
Students

67% of the est. higher education enrollment

Users

15.000
est. Academic Staff

11 students per academic staff

Users

10.000
est. Administrative Staff

1,5 academic Staff per administrative Staff

Facilities

est. 1.831.500
m^2 GFA

11,1 m^2 GFA per student on average

Finances

€ 2.541 min.
est. Annual Expenses

€ 15.400
av. annual expenses per student

The Finnish HE system consists of two complementary sectors: Universities and Polytechnics. There are 14 universities in the Ministry of Education and Culture sector; two of them are foundation universities (private) and the rest are public (OKM, 2009). In 2008, 111.780 FTE students were enrolled in the Finnish universities.

The universities employed 16.600 teaching and research staff and 14.300 other staff (possibly for administrative tasks). The same year, 104.200 FTE students were enrolled in the Finnish universities.

The universities employed 5.900 full time teachers, 310 part-time teachers, 4.480 own staff (named again "other") and 330 staff as purchased services (OKM, 2009). The analysis of the 14 Finnish universities resulted in a population of 164.822 students for the academic year 2012/13.

The universities' final accounts for 2008 amounted to €2,17bn, which shows a 3,8% increase compared to 2007. Of the total funding, approximately two-thirds (€1,43bn) were covered by budget funding and one-third by external funding (€742min).

Salary costs (€941min) were the largest item of expenditure, comprising two-thirds of the budget funding, whereas for the same period facility costs (€283min) accounted for almost 20% of the budget funding (OKM, 2009).

According to the Education and Training Monitor of 2013, despite the difficulties imposed by the recent economic context, Finland was able to maintain public expenditure for education above the EU average, which remained relatively stable between 2008 and 2011, from 5,8% to 6,4% of the country's GDP (EC, 2013). Especially for HE, there was public expenditure was increased by 6,7% between 2008 and 2010 (EC, 2013).

With respect to the campuses of the Finnish universities, there are three companies that provide their expertise for property maintenance and real estate portfolio management. One of them is Suomen Yliopistokiinteistöt Oy, SYK Oy, which is owned by the ten universities outside the metropolitan area and the State of Finland. Helsingin Yliopistokiinteistöt Oy, HYK Oy is a property investment company specialising in the ownership and development of the Helsinki university premises.

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	5,4	338.145	€ 189	6,8

Finally, Aalto Universities Properties Ltd was established to manage, maintain and develop the premises and properties of the Aalto university and provide the related support services.

For this reason it was possible to retrieve facts and information regarding the university campuses of Finland, at least with respect to the size of the used facilities and the number of users. Thus it was possible to have a complete picture of the assignable space per student, that ranges from 5,5 to 17 square meters, being 11,1 on average for the 14 universities.





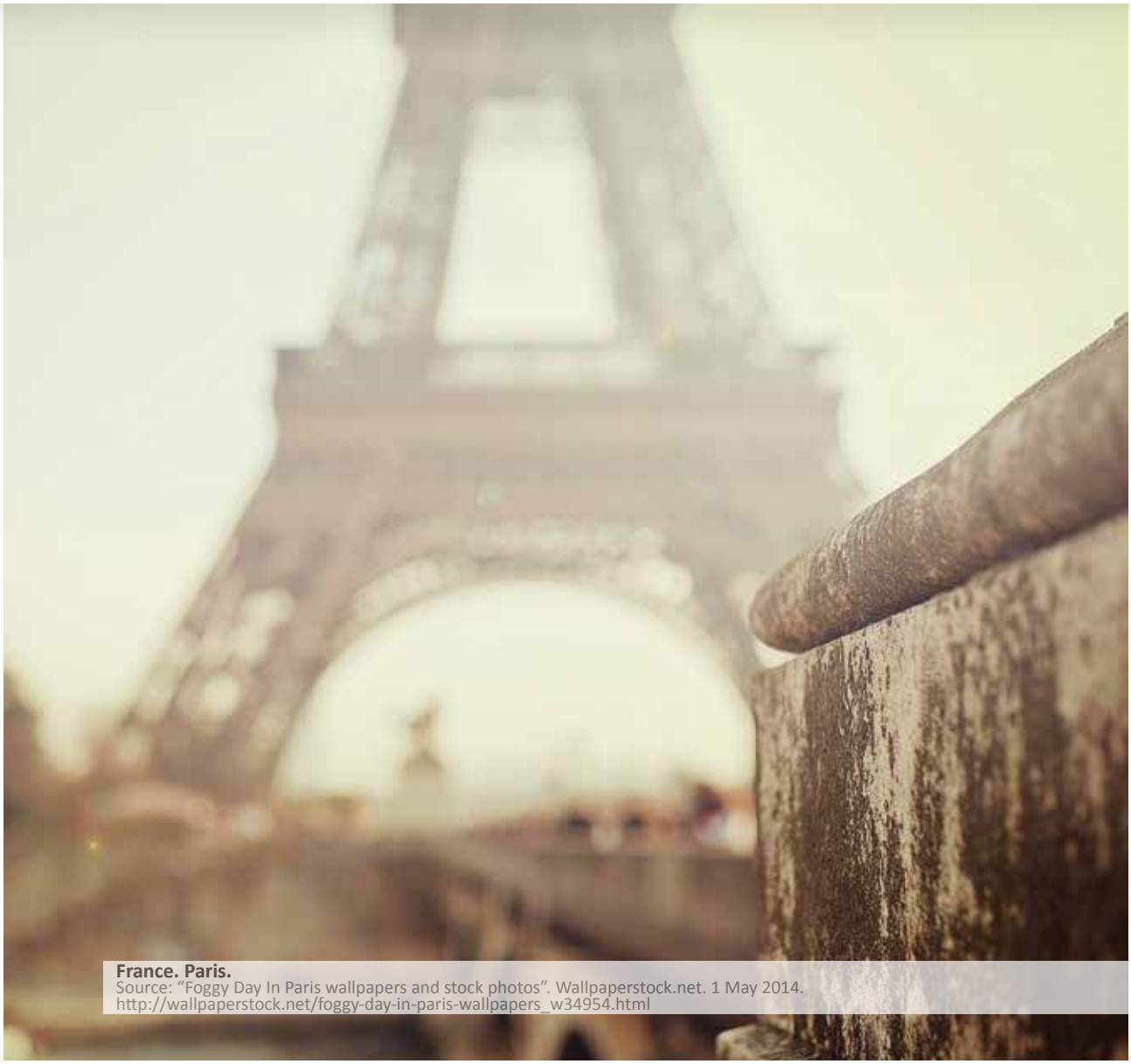





The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

28 member states of the European Union

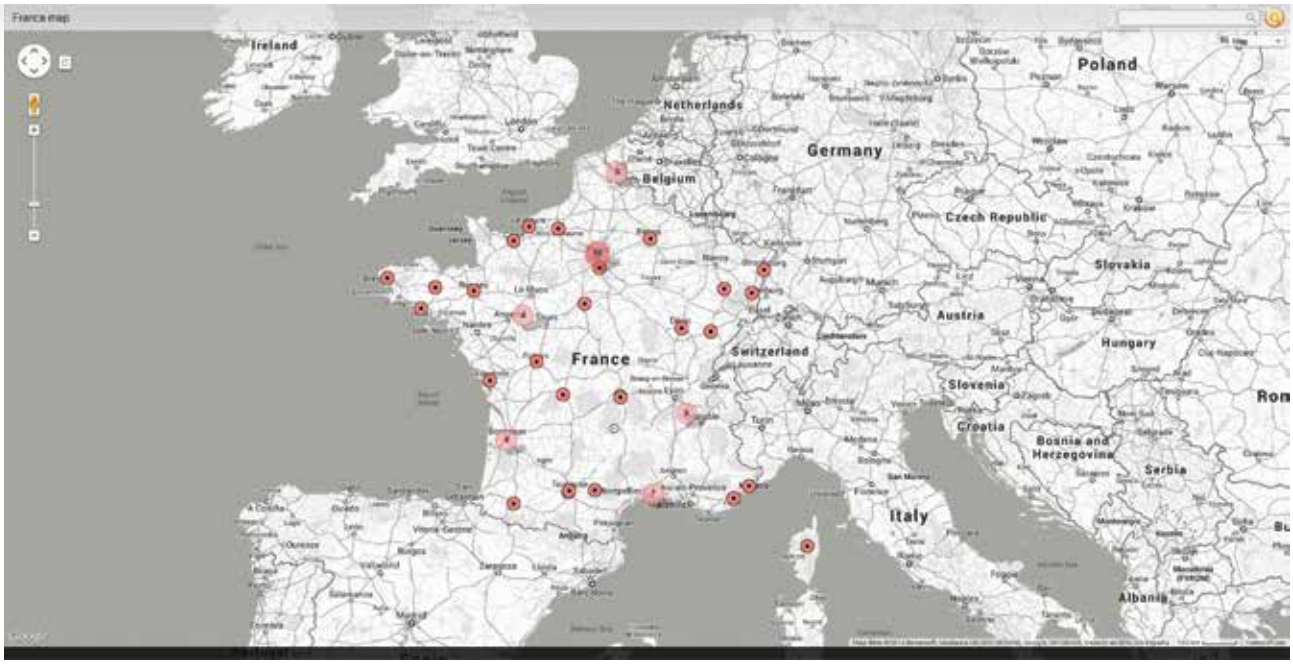
Country Profile: France



France. Paris.
Source: "Foggy Day In Paris wallpapers and stock photos". Wallpaperstock.net. 1 May 2014. http://wallpaperstock.net/foggy-day-in-paris-wallpapers_w34954.html

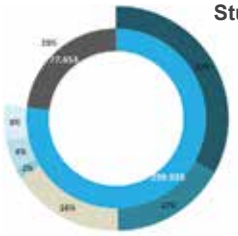
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	5,4	338.145	€ 189	6,8



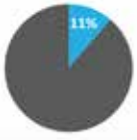
Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students



Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
34	Ecole Normale Supérieure, Paris (ENS Paris)
41	Ecole Polytechnique ParisTech
129	Université Pierre et Marie Curie (UPMC)
153	Ecole Normale Supérieure de Lyon
213	Sciences Po Paris
217	Université Paris-Sorbonne (Paris IV)
218=	Université Paris 1 Panthéon-Sorbonne
218=	Université Paris-Sud 11
232	Université de Strasbourg
234	Université Paris Diderot - Paris 7
248	Université Joseph Fourier - Grenoble 1
301	École des Ponts ParisTech
300-400	7 Universities
400-500	3 Universities

28 member states of the European Union

Country Profile: France

Users

1.500.000
Students

65% of the est.
higher education enrollment

Users

77.720
est. Academic Staff

19 students
per academic staff

Users

55.514
est. Administrative Staff

1,4 academic Staff
per administrative Staff

Facilities

est. 15.450.000
m^2 GFA

10,3 m^2 GFA
per student on average

Finances

€ 17.594 min.
est. Annual Expenses

€ 11.729
av. annual expenses
per student

For the HE sector , France spent € 28.0 billion in 2011, an increase of 0.7% compared to 2010. More than two thirds of this expenditure for higher education concerns the salary costs for personnel.

In 2011-2012, almost 100.000 academic staff worked in the HE sector, with 15.8 students aassigned per teacher. About 25% of them were assigned in Ile-de-France. Administrative staff for the same period were 53.000.

The total number of students in the HE sector was 2,4 million with students enrolled in French universities around 1,4 million. The international students were 12,3% of the total HE population. In the past decade student population of the HE sector was stagnant, with only enrolment to private universities showing considerable increase (Belghith et al., 2013).

Since 2002, a trend toward mergers of universities (with poles and networks) and consolidation of structures reflects a desire to streamline supply training in the area, implementation of synergies and creation of local structures visible in the internationally in the academic field (Abriac et al., 2012).

In 2007, the central tenet of France's higher education reforms is encompassed in a law establishing the autonomy of universities, giving them increased independency of centralised control. In return, institutions receive a greater share of their income based on their output and a reduced share through a multi-year contract (Benneworth, 2010).

In 2007, the real estate of French HEIs, was 5.500 5,500 hectares of land and a total built surface of 18.500.000 square meters. m2. It is heterogeneous, with 6.600 buildings of different age, located in 240 sites. A quarter of them did not meet fire safety standards, many buildings were damaged and poorly maintained.

According to the classification of the state of buildings, operated by the Directorate General Higher Education (DGES) from statements institutions, 30% appears at best as antiquated, and 15% are considered unsuitable for teaching and research (Cours de Comptes, 2009).

Alongside these reforms, In November 2007, "Operation Campus", an ambitious construction programme devoting increased public investment to flagship institutions was announced by the French government; a 5-billion-euros effort to create world-class universities.

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	65,4	547.030	€ 1.997	5,9

Through “Operation Campus”, a competition identified 10 Pôles de Recherche et d’Enseignement Supérieur (PRESs), or super-campuses. However the project did not progress as expected; “*Five years after its announcement, only €188 million of the €5 billion had been spent so far*”, commented Geneviève Fioraso, minister for higher education and research, re-launching the project in 2012 (Mashall, 2012).

The Campus du Plateau de Saclay project is probably the closest thing France has to a world-class university. The campus – which was created explicitly to rival the likes of the Massachusetts Institute of Technology, the University of Cambridge and Stanford University – hosts two PRESs (Benneworth, 2010).

During the research it was possible to retreive quantitative information about the campus of 41 French universities. The assignable space per student ranged from 1,4 to 25,3 square meters. On average, the same indicator was calculated as 10,3 square meters per student.

Moreover, between 2000 and 2009 expenditure for the universities’ real estate was almost doubled, from €490min to €939min. As mentioned before, at this year more than 35% of the universities facilities required a refurbishment that would cost higher than 60% of their replacement cost.









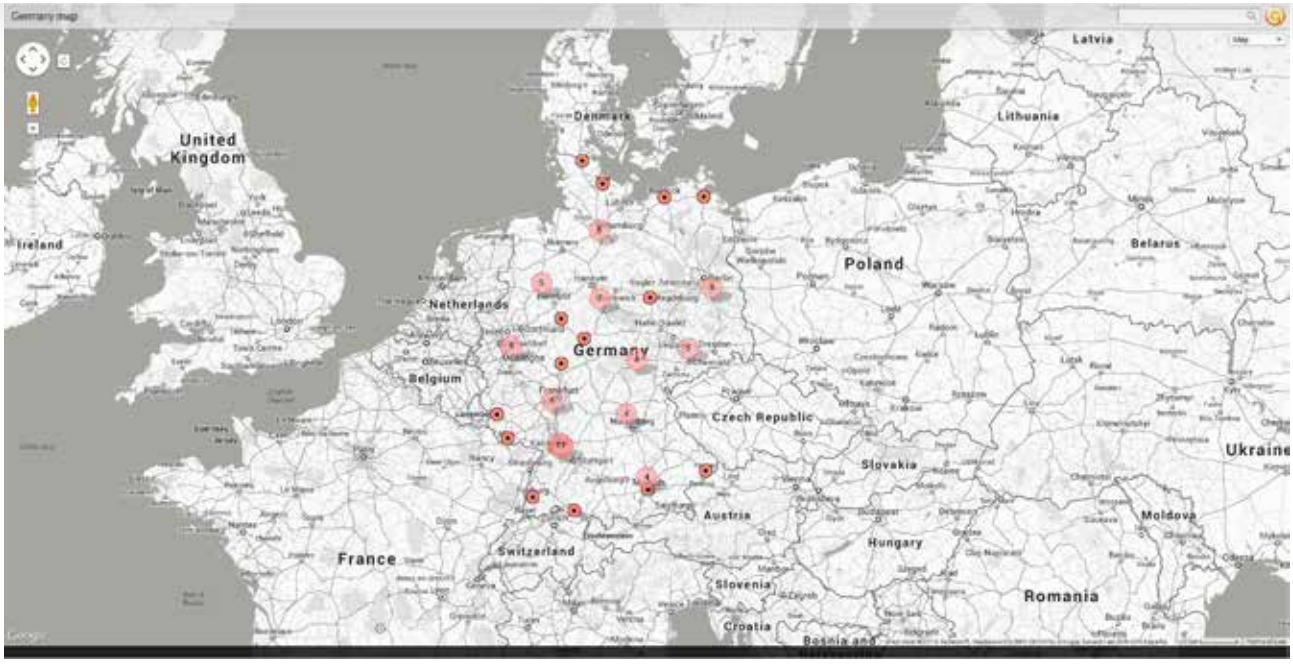

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Germany

Germany, Berlin.
Source: Mediaportal.rs. 1 May 2014.
http://www.mediaportal.rs/wp-content/uploads/2013/07/panorama37_ausblick-c3bcber-berlin.jpg

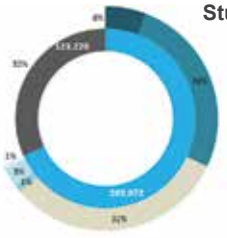
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	81,84	357.021	€ 2.593	5,1



Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
53	Technische Universität München
55	Ruprecht-Karls-Universität Heidelberg
60	Ludwig-Maximilians-Universität München
87	Freie Universität Berlin
106	Universität Freiburg
119	Georg-August-Universität Göttingen
130	Humboldt-Universität zu Berlin
141	KIT, Karlsruher Institut für Technologie
144	Eberhard Karls Universität Tübingen
150	Rheinisch-Westfälische Technische Hochschule Aachen
151	Rheinische Friedrich-Wilhelms-Universität Bonn
201	Universität Frankfurt am Main
200-400	23 Universities
400-600	7 Universities

28 member states of the European Union

Country Profile: Germany

Users

1.600.000 Students

64% of the est. higher education enrollment

Users

121.212 est. Academic Staff

13 students per academic staff

Users

71.301 est. Administrative Staff

1,7 academic Staff per administrative Staff

Facilities

est. 20.160.000 m^2 GFA

12,6 m^2 GFA per student on average

Finances

€ 21.864 min. est. Annual Expenses

€ 13.665 av. annual expenses per student

Germany currently invests around 1,1% of its Gross Domestic Product in tertiary education. The majority of the funds stem from public sources. In 2010, the total volume of public funds for universities amounted to 23,3 billion euro. Of this, 19,9 billion euro (85,4%) was provided by the federal states, which are responsible for the universities.

The German Federal Government provided 3,4 billion euro (14,6%) (HRK.de, 2014). Personnel costs were the biggest expense of the German universities, accounting for 55% of total higher education spending (Destatis.de, 2013).

There are currently 387 HEIs in Germany with a combined student population of approximately 2,4 million (1,6 million in public universities) (HRK.de, 2014). The international students were 8% of the total HE population . Of the HEIS, 110 are universities or similar institutions, 221 are universities of applied sciences (in German 'Fachhochschulen') and 56 are colleges of art or music.

Higher education institutions are either government-funded or government-accredited. In spite of the increasing presence of private HEIs, a large number of which have been established in the last few years, public HEIs remain clearly in the majority (HRK.de, 2013).

There are 279 government-funded institutions of higher education, compared with 108 private. Almost 94% of all students are matriculated at public higher education institutions. For 2013, there were 337.000 academic staff and 282.000 administrative staff in the German HE sector (HRK.de, 2013)

'Excellence Initiative'

The objective of the German 'Excellence Initiative', launched in 2005 by the Federal and State governments, is to strengthen Germany's standing as a location for research, to improve its international competitiveness, and to make outstanding work in universities and other research institutions more visible.

The prerequisite for being awarded the status of excellence is that the applicant institution must have at least one Cluster of Excellence and one Graduate School, as well as a coherent overall strategy for building up its research profile (Fu-Berlin.de, 2013)

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	81,84	357.021	€ 2.593	5,1

Universities that pursue these kind of excellence alliances would require efficient and effective allocation of resources. The real estate of such universities would have to be streamlined with the strategic agenda of such initiatives.

During the research it was possible to retrieve quantitative information about the campus of 14 German universities. The assignable space per student ranged from 5,8 to 33,2 square meters. On average, the same indicator was calculated as 12,4 square meters per student.



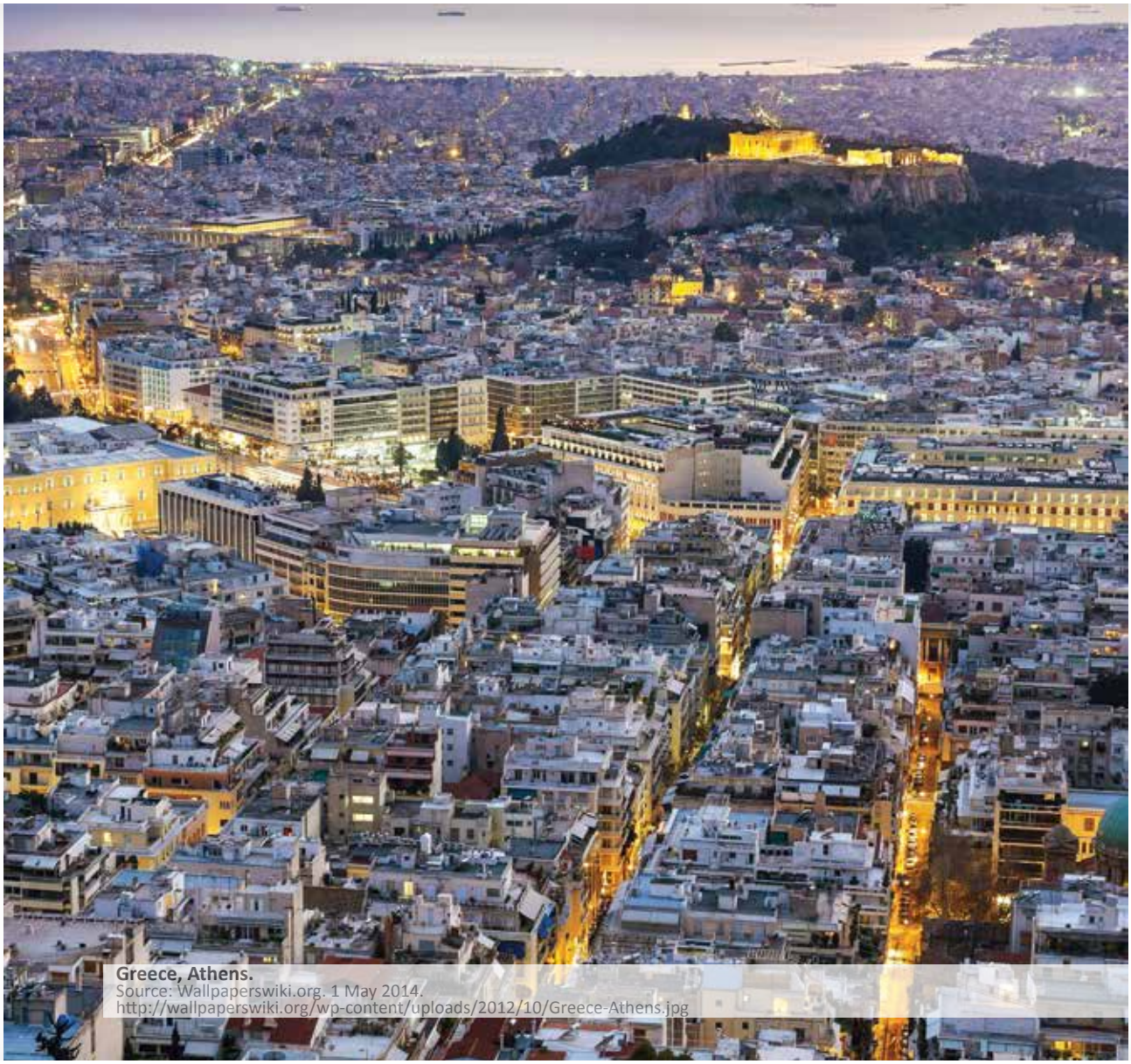






The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

Country Profile: Greece



Greece, Athens.
Source: Wallpaperswiki.org. 1 May 2014.
http://wallpaperswiki.org/wp-content/uploads/2012/10/Greece-Athens.jpg

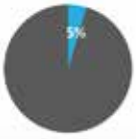
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	11,29	131.940	€ 209	4,1

Student mobility & Internationalisation

source: **OECD**,2012

Internationalisation of HE sector,
as % of total student enrollment



Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
451-500	Aristotle University of Thessaloniki
451-500	University of Crete
501-550	National and Kapodistrian University of Athens
551-600	National Technical University of Athens
601+	Athens University of Economics and Business
601+	University of Patras

28 member states of the European Union

Country Profile: Greece

Users

360.000
Students

62% of the est.
higher education enrollment

Users

8.654
est. Academic Staff

42 students
per academic staff

Users

4.327
est. Administrative Staff

2,0 academic Staff
per administrative Staff

Facilities

est. 2.052.000
m^2 GFA

5,7 m^2 GFA
per student on average

Finances

€ 196 min.
est. Annual Expenses

€ 545
av. annual expenses
per student

In 2012, there were 21 universities and 15 technological educational institutions in Greece. These HEIs comprised the state provided higher education. Eight of the universities are established in the Athens-Piraeus metropolitan area, two in Thessaloniki and the rest in the main county "capital" cities. Athens and Thessaloniki, the two main urban concentrations accommodate half of the Greek universities; the rest of them are organized in a nation-wide network, which in some cases this is also applicable in regional scale; six universities are decentralized and accommodated in different cities.

Student enrolment in Greek universities is around 60% of the total student population, around 360.000 in 2008. For the same year, 220.000 students were enrolled in the technological educational institutions. Tertiary education demand is partially covered by private HEIs, which are not entitled as universities. Student population is categorised as "active" and "inactive", for example 170.000 active out of 360.000 university students. Obviously this affects the state funding for the universities, which depends on a great extent on the total student population. However, since the beginning of the crisis, universities experienced huge budget cuts.

Greek universities are primarily funded by the Greek national government. The majority of the national funding concerns the cost for personnel, being on average seventy percent (70%) of universities' revenues by the year 2009, at the beginning of the crisis. Two years later, the percentage received by the Greek universities' for their payroll increased, as an average of seventy seven percent (77%) of the total revenues. At the same time, their revenues were decreased by twelve percent (12%) in nominal values, a fact that indicates a considerable pressure on the universities' budget and their performance overall (HQAA,2011).

Historically the establishment and development of Greek higher education follows the path of the Greek state. The first three universities were established in Athens in the mid-nineteenth century. Until the 1940 five new universities established in the two major Greek cities, whereas between 1950 and 1980 the focus shifted at the periphery, with nine new universities. Between 1990 and 2002 the final four Greek universities were established. This timeline can be used to assess the expected age of the universities' real estate.

In most of the cases, each university, especially after 1940, is accommodated in a campus outside the city centre, in which the majority of the buildings constructed at the period

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	11,29	131.940	€ 209	4,1

of its establishment. Even for the old universities (until 1940), they are also accommodated in similar campuses, along with the initially used -historic- buildings in Athens and Thessaloniki city centres.

Finally, the young universities, cover part of their accommodation needs through rent space, probably for higher flexibility as their state is less secure. In fact, some of them have already been merged or closed , as a result of crisis-related higher education reforms.

The real estate portfolio of Aristotle university of Thessaloniki, the biggest Greek university in terms of students (60.000) was analysed (Tzovlas, 2013). The university campus is located within the city of Thessaloniki in 430.000m2 land. It has buildings of 340.000 m^2 GFA, with an efficiency ratio of 70% on average.

Moreover, the university is accommodated outside of its campus in 98.000 m^2. The university owns almost all of its facilities, renting only 6.000 m^2 UFA outside the campus. At the same time, the university owns built assets of 9.400 m^2. In 2012, only 57% of them was let out. On average, there are 2 square meters (UFA) of educational space per student, whereas the average office workplace is 30 square meters. The educational space per student varies according to each faculty's academic profile, for example 0,3 for Theology and 6,3 for Chemistry regarding the faculties accommodated on the university campus.

During the first years of the financial crisis and due to the imposed budget cuts and the generalised social unrest, there were periods of time that some buildings of the university were forced to closure, as they couldnt meet sanitary standards (strikes of cleaning and maintenance personnel).



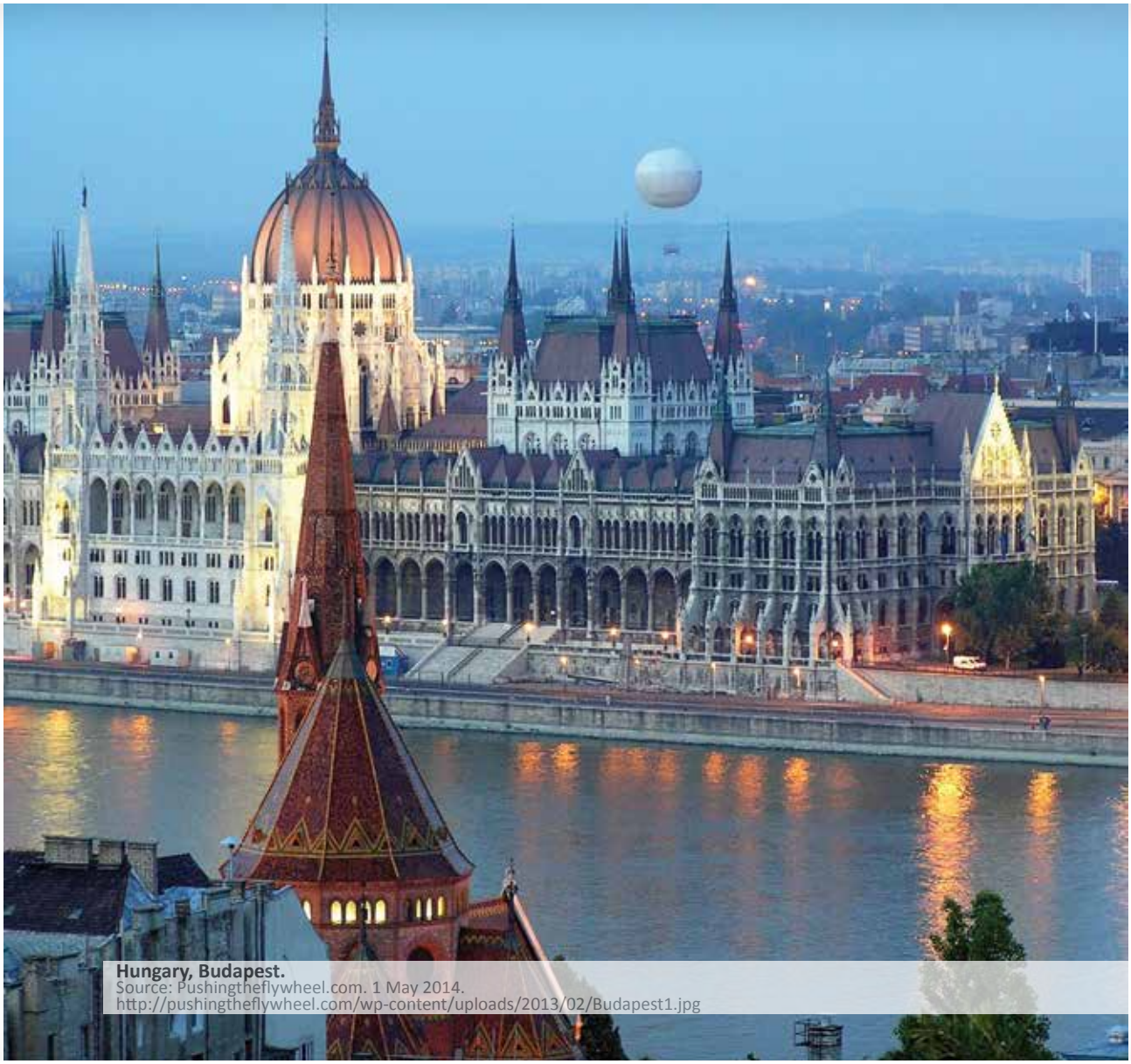







The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

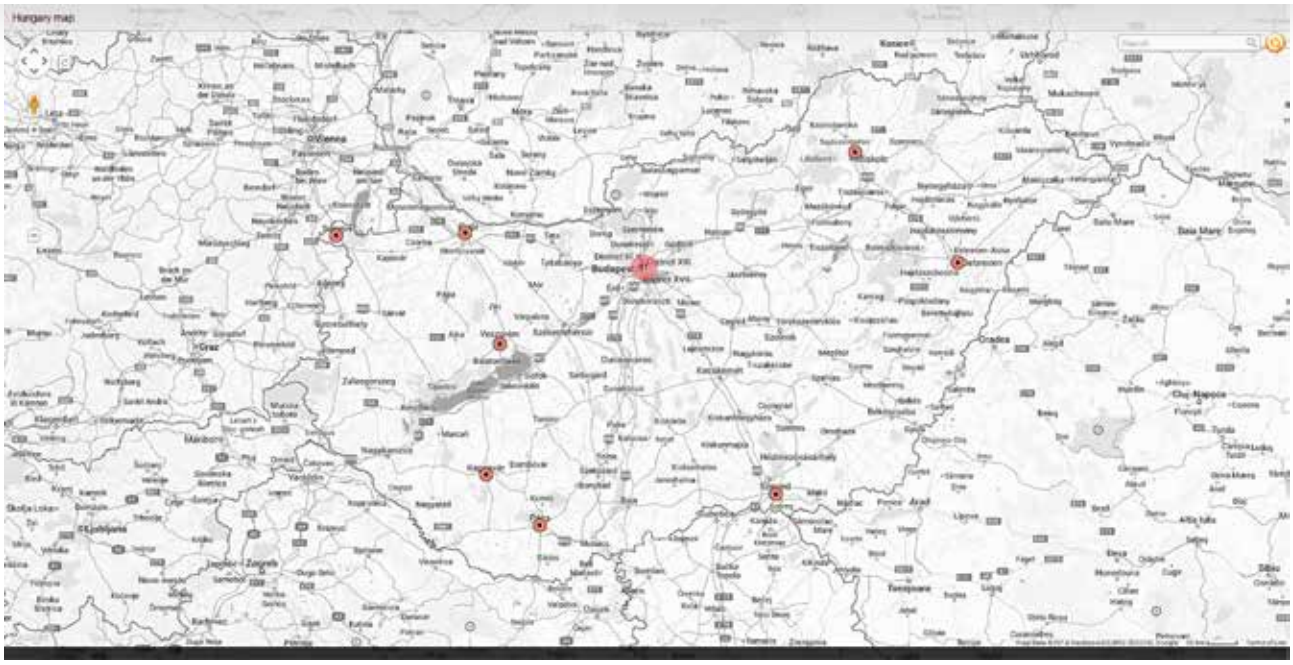
Country Profile: Hungary



Hungary, Budapest.
Source: Pushingtheflywheel.com. 1 May 2014.
http://pushingtheflywheel.com/wp-content/uploads/2013/02/Budapest1.jpg

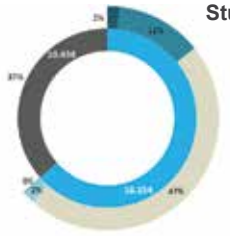
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	9,96	93.030	€ 100	5,1



Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
501-550	University of Szeged
551-600	Corvinus University of Budapest
551-600	Eötvös Loránd University
601+	University of Debrecen

28 member states of the European Union

Country Profile: Hungary

Users

244.000
Students

66% of the est. higher education enrollment

Users

16.486
est. Academic Staff

15 students per academic staff

Users

14.988
est. Administrative Staff

1,1 academic Staff per administrative Staff

Facilities

est. 2.122.800
m² GFA

8,7 m² GFA per student on average

Finances

€ 610 min.
est. Annual Expenses

€ 2.500
av. annual expenses per student

Universities or colleges (Fachhochschule) qualify as higher education institutions in Hungary. In the socialist era, Hungary's HE was mostly characterized by large, state-funded institutions, with specific scientific focus. A dual system of universities versus colleges, with the exception of the institutions of theology.

In 1990, legislation allowed the establishment of non-state HEIs and since 1993, Act LXXX, on Higher Education regulated the status of state-funded and non-public institutions (Balázs, et al., 2011). In the last twenty years many legislative changes took place, influenced partly by the political context and party due to HEIs' feedback of their operation. In 2000 many small HEIs were restructured to larger ones, through the 'Law of Merger' (Balázs, et al., 2011) which reduced the total number of HEIs from 89 in 1999, to 62 in 2000.

Hungarian HE system is characterized by the high proportion of Colleges. The majority of state HEIs are Universities, while on the other hand private HEIs are mostly Colleges. Private universities account for only 10% of the HE system. In 2012, the Hungarian HE sector comprised of 19 state universities, 7 private universities, 9 state and 32 private colleges.

In 2009/10, the total number of students in the Hungaria HE was 370.333 (Db.nefmi.gov.hu, 2009). Two thirds of them studied in state universities, while 20% studied in state colleges. Non-state HEIs educated the remaining 10% of the student body, with 6% in church-maintained institutions and 7,5% in private HEIs, with the vast majority being private colleges (Balázs, et al., 2011). Even if the amount of non-state HEIs is 58%, only 16% of the students are studying in them (Balázs, et al., 2011).

During the analysis of the 19 state universities in 2013, 243.783 students were counted. Assuming a slight decrease (average annual decrease of 3% between 2006/07 and 2009/10) in the Hungarian HE student population, it still matches the two thirds ratio of 2009/10. The number of instructors in Hungary was around 23.000 since the beginning of the millennium; in 2009/2010 it was 21.934.

Given that the headcount of students was growing up until 2006, the number of students per instructor in Hungary was at first doubled (between 1995 and 2004), to then stabilize itself at its current levels (Balázs, et al., 2011).

In 2008, state expenditure on HE was 0.97% of GDP, and

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	9,96	93.030	€ 100	5,1

1.9% of the state's budget (Balázs, et al., 2011). There is a claim that the expansion of the Hungarian HE had a limited financial background, supported by the fact that among the OECD countries there was only one more example where state expenditure for HE declined between 2000 and 2007 (Balázs, et al., 2011).

Based on national statistical data, during the quoted period it is possible to observe an increase in state expenditure for HE , from €462min in 2000 to €784min in 2007 (Db.nefmi.gov.hu, 2009). However the increase in nominal terms might have been nullified if discounted in real value. In 2011, the rate of public expenditure on education compared to the GDP decreased to 4.3% (from 4,7% in 2010), however expenditures allocated to higher education increased more (by 4,4%) than the inflation level (3,9%) (Eurypedia, 2013).

The Hungarian HE system is centripetal, with Budapest being an absolute centre, while regional coverage is not yet properly established (Balázs, et al., 2011). With respect to university campuses, 10 universities are located in Budapest with around 40% of the total university students.

Of these universities, eight are historic institutions (older than 100 years old) , which are expected to be using many historic buildings. However, at the same time they would also be facing challenges related to the age of their facilities. Regarding the size of the facilities, it was possible to retrieve information from two universities differing in size and location; Budapest University of Technology and Economics University with 20.000 students and 260.000 square meters of facilities (12,9 m^2 per student) and Kaposvar University, with 3.000 students and 14.500 square meters (4,5 m^2 per student).










The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Ireland

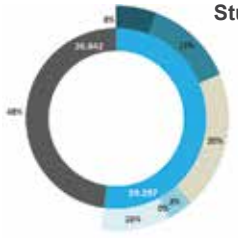
Ireland, Dublin.
Source: "Temple Bar Dublin". Apartmentdistrict.com. 1 May 2014.
http://www.apartmentdistrict.com/blog/en/tag/irish-pub-temple-bar/

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km²)	GDP (bn Euros)	GDP for Education (% of GDP)
	4,60	70.280	€ 159	6,5

Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector, as % of total student enrollment

Student mobility towards EU28, market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
67	Trinity College Dublin (TCD)
131	University College Dublin (UCD)
190	University College Cork (UCC)
287	National University of Ireland, Galway (NUIG)
324	Dublin City University (DCU)
451-500	Dublin Institute of Technology (DIT)
451-500	University of Limerick (UL)
501-550	National University of Ireland Maynooth (NUIM)

28 member states of the European Union

Country Profile: Ireland

Users

103.000
Students

53% of the est. higher education enrollment

Users

7.203
est. Academic Staff

14 students per academic staff

Users

6.000
est. Administrative Staff

1,2 academic Staff per administrative Staff

Facilities

est. 1.277.200
m^2 GFA

12,4 m^2 GFA per student on average

Finances

€ 1.524 min.
est. Annual Expenses

€ 14.800
av. annual expenses per student

The Irish HE system educates students in 7 Universities, 14 Institutes of Technology – including the Dublin Institute of Technology and 7 Colleges of Education. Moreover, in a number of other third level institutions that provide specialist education in fields such as arts and design, medicine, business studies, rural development, theology, music and law.

The statuary planning and development body for HE and research in Ireland is the Higher Education Authority (HEA), having advisory powers throughout the whole third-level education sector and being at the same time, the funding authority for the Irish HEIs. In 2013 the ministry of Education and Skills announced that the Irish HE sector had to be re-organised (Education.ie, 2014).

In 2013, HEA published a report which set out an initial performance evaluation framework for the Irish higher education, which was developed in the context of the implementation of the national strategy for Higher education to 2030. The national strategy aims at fostering the coherence, and maximising the performance, of the higher education system—as a system (HEA, 2013).

From this report it was possible to retrieve the complete profile of the Irish HE sector of the academic year 2010/11. The Irish HE sector educated 193.187 students, 103.619 enrolled in universities, 11.619 in Colleges and 78.380 in Institutes of Technology. On average, 81% of them were full time students. The Irish HE sector employed 13.106 Academic staff and 10.349 Support staff in total. More than half from each category were university employers (7.168 Academic and 6.532 Support staff). In Irish universities, there were on average 14 students per one Academic staff, while there were 17% more Academic Staff, compared to Support staff (HEA, 2013).

For the academic year 2010/11, the total expenditure for the Irish HE sector was €3,3bn, of which €1,5bn for Universities, €970min for Colleges and €790min for Institutes of Technology. Universities received on average 29% of their income from State Grants, 26% from Research Grants and Contracts and 7% from other sources.

The largest portion of the universities' revenues was Fees, being 38% of the total income. Considering that, universities' average expenses per one FTE student was €15.057, while the same indicator for Colleges was €10.126 and €10.491 for Institutes for Technology (HEA, 2013).

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	4,60	70.280	€ 159	6,5

With respect to the universities' campus, it was possible to acquire the space assigned per one FTE student. Moreover, this indicator was provided in two different measurements, one for the gross space and one for the net space, making it possible to calculate the efficiency ratio of the Irish university buildings.

On average Irish universities provide 8,6 net square meters of facilities to each FTE student (12,3 square meters of gross space). This results in the estimation of total gross surface of 1.270.000 min square meters, 889.000 square meters of net spaces and an average building efficiency of 70% (HEA, 2013).










The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

Country Profile: Italy

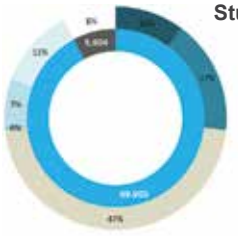
Italy, Rome.
Source: Traveluxor.com. 21 November 2013. 1 May 2014.
http://traveluxor.com/wp-content/uploads/2013/11/rome1.jpg

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	60,82	301.230	€ 1.580	4,7

Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
194	Università di Bologna (UNIBO)
216	Sapienza - Università di Roma
244	Politecnico di Milano
256	Università degli Studi di Milano
298	Università degli Studi di Padova (UNIPD)
314	Università di Pisa
336	Universitá degli Studi di Roma - Tor Vergata
400-500	7 Universities
500-600	8 Universities

28 member states of the European Union

Country Profile: Italy

Users

1.700.000
Students

94% of the est.
higher education enrollment

Users

52.147
est. Academic Staff

33 students
per academic staff

Users

57.941
est. Administrative Staff

0,9 academic Staff
per administrative Staff

Facilities

est. 12.750.000
m^2 GFA

7,5 m^2 GFA
per student on average

Finances

€ 13.878 min.
est. Annual Expenses

€ 8.164
av. annual expenses
per student

There are currently 77 universities in Italy; 55 State (public) universities, 3 technical universities, 14 private universities,2 universities for foreigners and 3 university institutions for postrgraduate studies (MIUR, 2003).

Spending on higher education , according to the latest calculations carried out in 2008 reached a total of € 19.542 million; in real terms, it was a 7% increase compared to 2007 and by 4% compared to 1999 (MIUR, 2011). However the nominal change in funding between 2009 and 2012 was registered by EUA Public Funding Observatory as -12% (EUA, 2014).

Without more recent information, data from 2009 would be used to describe the finances of the Italian HE sector. A 67% for the HE sector funding comes from public sources and the remaining 33% comes from private, including household expenses. Public funding comes mainly from the State (64%) and , to a lesser extent , by public institutions (6%) and international bodies (2%), in particular by the European Union. Different situation is that of non-state universities , where more than 74% of the financial resources in entry comes from contracted activities (46%) and from student fees (more than 25%) (MIUR, 2011).

Transfers and investments from the state accounted for only 7,2% As for the state universities, in 2009 about 65 % of the resources were allocated to personnel costs. In particular , 41,5 % allocated for the academic staff and 17,1% for the administrative staff ; the remaining resources allocated as; 14% for operating costs, and 9.5% for interventions in favour of the students. (MIUR, 2011).

Annual first-year enrolment to the Italian HE was increasing from 2000 to 2004 (7.5% on average), however the following years, until 2010, there was constant decrease. The total number of students is relatively stable, since 2004, with approximately 1,8 million students participating.

International students in the HE sector were doubled from 2000 to 2010, from 1,9% to 4,2% (MIUR, 2011). In 2010, the academic staff of the HE sector was 57.748, comprised by 60% full professors and 40% of teachers on contract, in total 11, 1% more than in 2000 but 8% less than in 2008 (MIUR, 2011). This difference is attributed to recent restructuring on expenses for personnel.

Regarding university facilities, Italian universities tend to be

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	60,82	301.230	€ 1.580	4,7

more mono-functional, providing mainly facilities for education, research and residences for students. Moreover, the provided student housing does not meet the student demand (quality or quantity, but not verifiable) which is covered by the local private house leasing market. Finally, a last trend concerns the students growing need both of a real university life experience and of proper structures able to hold collateral activities, which could be related with the provided low functional mix.

Regarding university facilities, Italian universities tend to be more mono-functional, providing mainly facilities for education, research and residences for students. Moreover, the provided student housing does not meet the student demand (quality or quantity, but not verifiable) which is covered by the local private house leasing market.

Finally, a last trend concerns the students growing need both of a real university life experience and of proper structures able to hold collateral activities, which could be related with the provided low functional mix.

During the research it was possible to retrieve quantitative information about the campus of 5 Italian universities. The assignable space per student ranged from 3,4 to 15,0 square meters. On average, the same indicator was calculated as 7,5 square meters per student.










The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Latvia

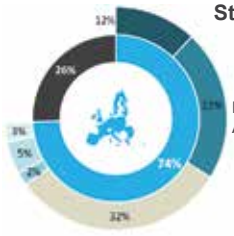
Latvia, Riga.
Source: Tunliweb.no. 1May 2014.
http://www.tunliweb.no/Bilder_SM/_album_Riga/a2.jpg

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	2,04	64.589	€ 20	5,6

Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University

28 member states of the European Union

Country Profile: Latvia

Users

51.000
Students

41% of the est.
higher education enrollment

Users

2.576
est. Academic Staff

20 students
per academic staff

Users

2.862
est. Administrative Staff

0,9 academic Staff
per administrative Staff

Facilities

est. 499.800
m^2 GFA

9,8* m^2 GFA
per student on average

Finances

€ 194 min.
est. Annual Expenses

€ 3.800
av. annual expenses
per student

In Latvia, there are 34 public institutions of higher education and 22 higher education institutions established by legal bodies (Ministry of Education and Science, 2014). Latvian HE is provided in 6 Universities, 26 Institutions of Higher Education and 24 Colleges. In the academic year 2000/01, there were 19 state HEIs with 87.207 students and 14 Juridical persons established institutions of higher education with 14.063 students, thus the total number of students was 101.270 (Latvijas Statistika, 2014).

In 2002 and 2003 the first 5 private colleges were established and in 2004, another ten state colleges. However in 2014, the total student population was decreased to 89.671 students, a decrease of 30% since 2004, where there were 127.656 students in total. This may be attribute to the ageing -hence decreasing- population of Latvia.

During the analysis of the six Latvian universities, 50.815 students were counted, almost 87% of the public institutions of higher education, being 57% of the total enrolment of the Latvian HE sector. The teaching staff of these six universities was around 2.700. resulting in a student/teacher ratio of 19,8.

The expenditure for the Latvian education does not follow the decreasing trend of the student population, at least in nominal values. In 1995, the total expenditure was €284min, while in 2000 it grew to €555min and in 2011 it was €1,2 bn. In 2010, total expenditure for the Latvian education was 5,01% of the country's GDP (Latvijas Statistika, 2014). Unfortunately it was not possible to retrieve official information regarding the funding of HE.

During the research it was not possible to retrieve any quantitative information regarding the campus of these universities. However, it is possible to acquire an overview of the universities' needs in infrastructure by looking at financial-related information, and specifically the European Structural Funds for the modernisation of the country's HE.

Thirty project proposals have been approved under the theme ""Higher education institutions in the modernization of the premises and facilities to improve the quality of education, including providing education Opportunities for people with disabilities" with a total cost of €142min (VIAA, 2014).

The proposed projects cover aspects like improving obsolete built (from the sixties and seventies) and movable scientific infrastructure, upgrade ICT services and equipment,

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	2,04	64.589	€ 20	5,6

upgrading the facilities to new standards for people with disabilities, renovation works, adaptation and re-use of old buildings as well as sometimes, the construction of new, necessary facilities and transport infrastructure (VIAA, 2014). Considering the total funding of the Latvian education, the approved modernisation costs only for higher education account for a 10%, thus, this is a considerable amount of required investment.

During the research it was not possible to retrieve quantitative information regarding the educational facilities of the Belgian Universities. For this reason and for the purposes of estimating a total gross floor area of the Belgian universities, the average assignable square meters per student -as a research result- has been used, and is highlighted with an asterisk (*).









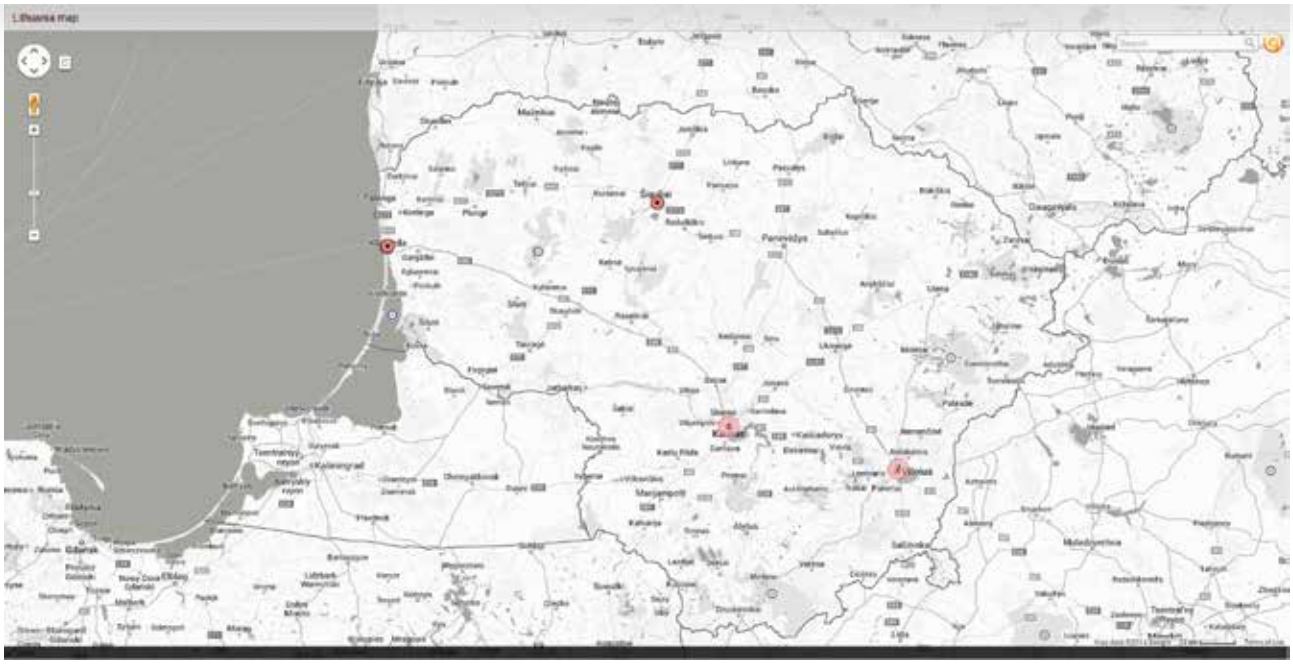

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Lithuania

Lithuania, Vilnius.
Source: 3.bp.blogspot.com. 1May 2014.
http://3.bp.blogspot.com/3vZJxndHSQw/TvxHkzTi7JI/AAAAAAAA6zA/Xjg6SQnzREc/s1600/vilnius_sightseeing.jpg

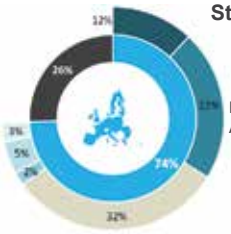
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	3,01	65.200	€ 31	5,6



Student mobility & Internationalisation

source: **OECD**,2012



EU 28 Average

Internationalisation of HE sector, as % of total student enrollment

Student mobility towards EU28, market share % of total incoming students

EU 28 Average

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
501-550	Vilnius University
601+	Vilnius Gediminas Technical University
601+	Vytautas Magnus University

28 member states of the European Union

Country Profile: Lithuania

Users

137.000
Students

69% of the est. higher education enrollment

Users

11.610
est. Academic Staff

12 students per academic staff

Users

2.419
est. Administrative Staff

4,8 academic Staff per administrative Staff

Facilities

est. 1.342.600
m^2 GFA

9,8* m^2 GFA per student on average

Finances

€ 548 min.
est. Annual Expenses

€ 4.000
av. annual expenses per student

The Lithuanian HE sector consists of 15 state and 7 private universities, and 15 state and 12 private colleges. In 2009, there were 137.572 students enrolled in the state universities, 5.413 students enrolled in the private universities, 43.687 students enrolled in the state colleges and 14.017 students in the private colleges. For the same year, state universities employed 8.511 teaching staff and 8.873 administrative staff, out of 11.841 teaching and 12.632 administrative staff in total (Daniunas & Radzeviciene, 2009).

In the last two decades there was a notable change in the number of students, influenced by Socio-economic factors and the HE sectorial reform (Daniunas & Radzeviciene, 2009). In 2007, the level of student enrolment in tertiary education in Lithuania was very high, however demographic problems will soon -if not already- affect it negatively (Pociute, Dikcius, & Pikturna, 2007). This was supported by the fact that the number of pupils in the secondary schools had already declined by one third, thus the estimated number of students in universities and colleges was expected to decrease as well (Pociute,Dikcius, & Pikturna, 2007).

In 2005, the total expenditure for the Latvian HE accounted for €197min, of which €164min was allocated to universities, €33min to Colleges and €15min to University Research Institutes (Pociute et. Al, 2007).

Specifically for universities, state funding accounted for 88% of the total funding , thus state funding could be broken down as 30% for Research, 68% for Studies, 2% for the Science and Education Fund and a slight amount for State Research Programmes. Moreover, EU funds accounted for 3% of the total funding and finally 9% came from other sources (Pociute, Dikcius, & Pikturna, 2007).

It has to be mentioned that tuition fees should be included in the HEIs income, but there was not possible to identify a definite figure for the average tuition fee a student has to pay. An estimation deriving from the analysis of a preliminary report by EUA is possible, assuming tuition fees as a 20% to 40% of the universities' budget.

During the research it was not possible to retrieve quantitative information regarding the educational facilities of the Belgian Universities. For this reason and for the purposes of estimating a total gross floor area of the Belgian universities, the average assignable square meters per student -as a research result- has been used, and is highlighted with an asterisk (*).

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	3,01	65.200	€ 31	5,6









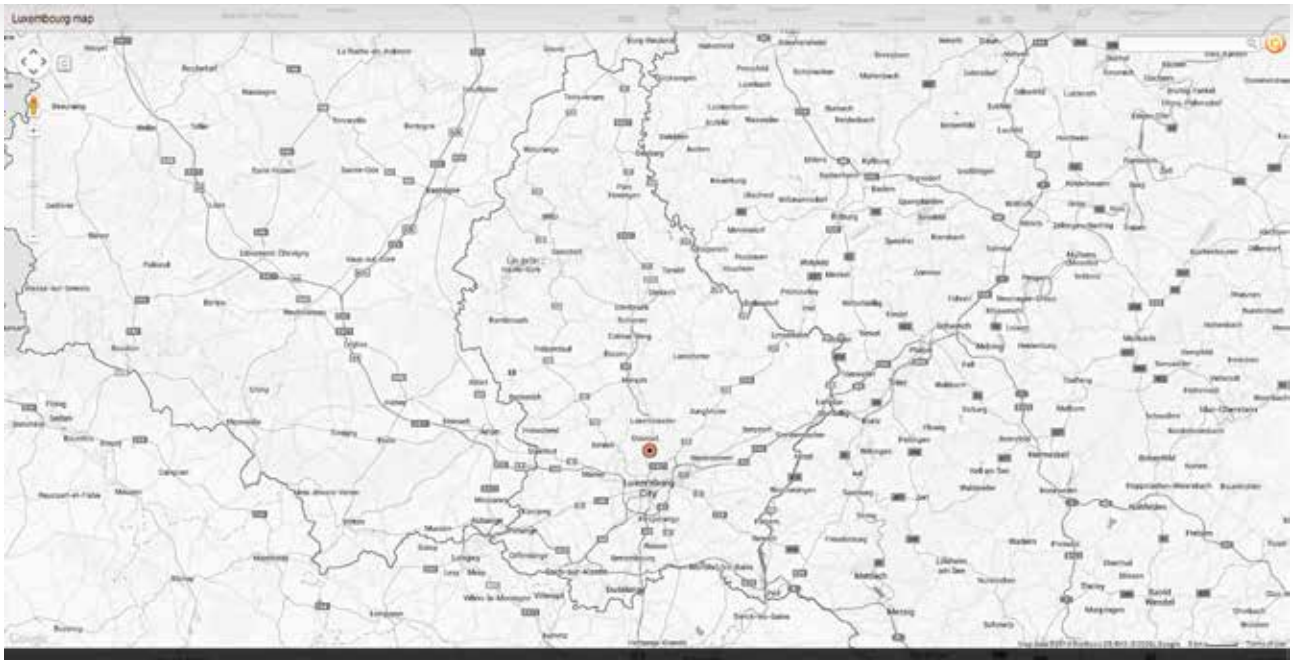

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

Country Profile: Luxembourg

Luxembourg, the University of Luxembourg
Source: Wikimedia.org. 1May 2014.
http://upload.wikimedia.org/wikipedia/commons/f/f3/University_luxemburg_lmp_main.jpg

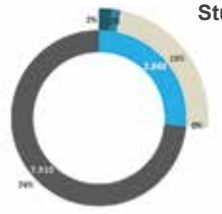
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	0,52	2.586	€ 43	3,2

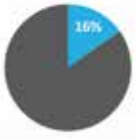


Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment



Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University

28 member states of the European Union

Country Profile: Luxembourg

Users

12.000
Students

67% of the est. higher education enrollment

Users

412
est. Academic Staff

29 students per academic staff

Users

Not Found
est. Administrative Staff

Not Found academic Staff per administrative Staff

Facilities

est. 192.000
m^2 GFA

16,0 m^2 GFA per student on average

Finances

€ 154 min.
est. Annual Expenses

€ 12.800
av. annual expenses per student

The only university institution of Luxembourg was recently established by law in 2003. The University of Luxembourg was established as a specialised university of modest size, focusing in both teaching and research and aiming at acquiring soon an international status (O&O Monitoring, 2009).

The main tasks where the University focuses are interdisciplinarity, mobility and multilingualism. The university has three languages, French, German and English and all degree courses must be bilingual, the secondary language representing at least 25% of the course. During the first cycle, student Mobility is mandatory and at least 30 ECTS must be obtained at a partner institution (O&O Monitoring, 2009).

The University of Luxembourg is by law a public institution that is managed under private law, enjoying financial, administrative and educational independence. In terms of institutional autonomy, the university is free to set its own policies regarding student selection. Moreover, it is free to allocate the received funding according to its own decisions, hire and compensate its staff based on the university rules and finally define its academic programmes (O&O Monitoring, 2009).

The University is financed by a yearly lump sum allowance determined by a contract of four-year duration between the Government and the University. For the period 2005-2008 the funding was €31min for the first year and €72min for 2008, and for the period 2010 -2013 €83min for 2010 and €119min for 2013 (European Commission, n.d.).

The four year contracts are determined based on performance indicators such as the teacher/student ratio and research output indicators such as the number of publications, the number of citations, the number of patents and licences, the number of published PhDs and the participation in European research programmes. For 2013, the research funding accounted for 23,00min. Another source of funding for the university are tuition fees which account for around 2% of its budget (European Commission, n.d.).

Since its establishment in 2003, by 2008.the student population was almost doubled, from 2.692 to 4.517 students (O&O Monitoring, 2009). In 2013, 6.200 students were counted during the analysis of the university.

According to the Strategic framework of the university (2006-2009 and 2010-2015), the university will provide education for 8.000 students in two campuses (Tarrach, 2005)

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	0,52	2.586	€ 43	3,2

the first currently in use and the second one which is under development (Uni.lu, 2014).

The new campus, “Cité des Sciences” or the Campus Belval, is a multifunctional urban renewal project of a 120 hectares area, with 120.000 square meters (gross floor area) of Offices, Retail, Housing and the new campus of the university of Luxembourg of a total investment cost around €1bn (EMI, 2013).

The project is scheduled in two phases. The first phase (2010-2015) will provide buildings necessary for the operation of the two faculties that will be redeployed at the new campus and by the end of the project (Le Fonds Belval, 2012) besides the complete accommodation of the university, off-university research centres and a start-up centres will be developed (EMI, 2013).









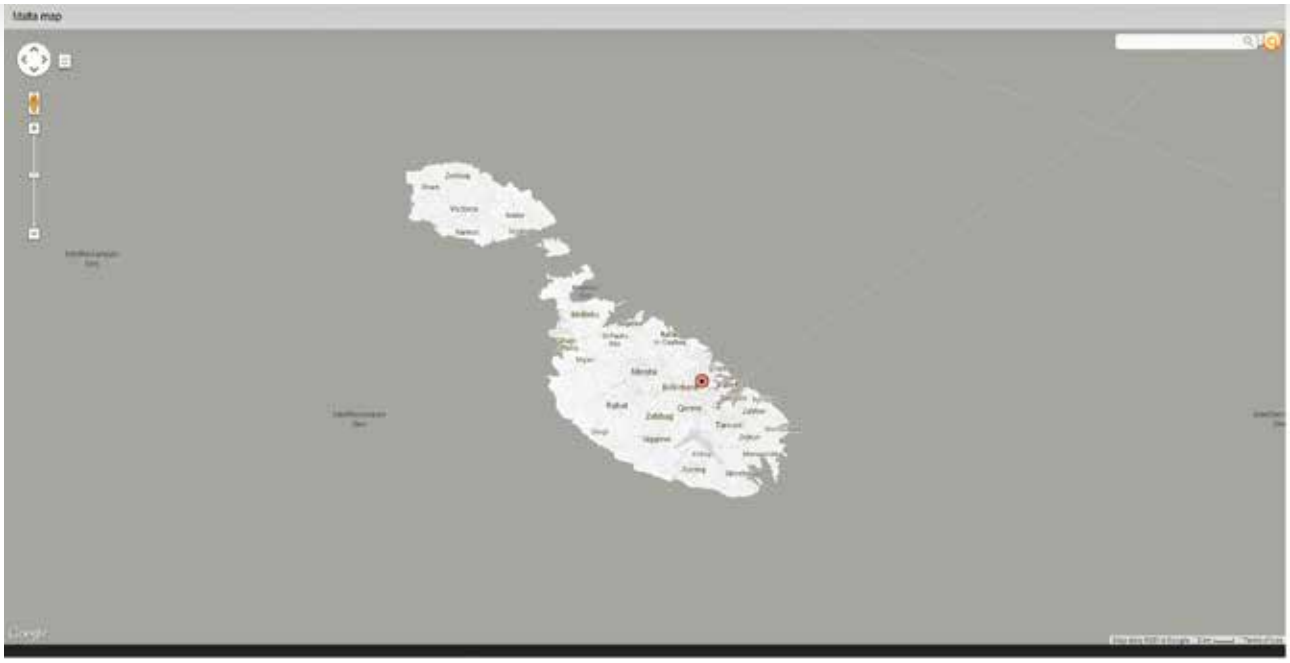

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Malta

Malta, Valetta.
Source: Primestudy.ge. 1 May 2014.
http://primestudy.ge/wp-content/uploads/2013/11/Malta-harbour.jpg

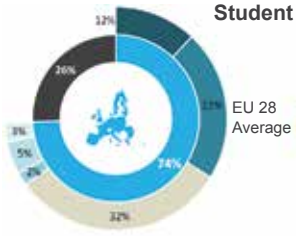
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	0,42	316	€ 7	5,5



Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University

28 member states of the European Union

Country Profile: Malta

Users

11.000
Students

41% of the est.
higher education enrollment

Users

797
est. Academic Staff

14 students
per academic staff

Users

725
est. Administrative Staff

1,1 academic Staff
per administrative Staff

Facilities

est. 107.800
m^2 GFA

9,8* m^2 GFA
per student on average

Finances

€ 58 min.
est. Annual Expenses

€ 5.250
av. annual expenses
per student

In Malta there are more than a hundred institutions that provide post-secondary education (ncfhe.org.mt, 2014), however due to the size of the country only one university exists, the University of Malta. Higher education refers to tertiary education provided by certified state, state-dependent or independent institutions or tuition centres (NCFHE, 2012).

Tertiary education in Malta is predominantly offered by the University of Malta. However, the main state post-secondary vocational institutions are also providing programmes that reach up to a tertiary level. Nevertheless, tertiary level education is also provided by several independent/private tuition centres (NCFHE, 2012).

In 2011, the Total Further & Higher Education Population in Malta was 27.769 students. Of them, 11.741 were enrolled in the total Higher Education. Between 2001 and 2011, Malta had witnessed an 80% increase in the total student population (beyond the age of compulsory education) enrolled within further and higher education where for the same period the total Higher Education population grew by 56% (NCFHE, 2012).

In 2013, the University of Malta educated around 11.000 students, employing 800 teaching and 700 administrative staff. The revenues of the university grew from €37,5min in 2006 to €57,8min in 2010 (Camilleri, 2010). The University has fourteen Faculties, a number of Institutes and Centres and a School of Performing Arts.

The "Foundation Stone" of the main campus at Msida (known as Tal-Qroqq) was laid on 22 September 1964 by the Rt. Hon. Duncan Sandys, the then Commonwealth Secretary (UM.edu.mt, 2014). The total area of the Msida Campus is 194.452 square metres (UM.edu.mt, 2014).

Additionally, there are two other campuses, one at Valletta and one at Gozo island. However, the information provided by the university does not specify whether the area is built area or the total surface upon which the university facilities are built.

The Valletta Campus, which is accommodated in the Old University Building, dates back to the establishment of the Collegium Melitense and includes the Aula Magna. In the Valletta Campus many international conferences, seminars, short courses and summer schools are held, being a prestigious setting and finally it also serves as the venue of the

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	0,42	316	€ 7	5,5

University's International Masters Programme (UM.edu.mt, 2014).

The Gozo Campus was set up in 1992 with the collaboration of the Ministry for Gozo (UM.edu.mt, 2014). It hosts part-time degree, diploma as well as short-term courses and serves as supporting space for the needs of the increasing numbers of students, who are mainly accommodated at the university's main campus. Finally, the Gozo campus includes the Guesten Atmospheric Research Centre, within the Department of Physics, while it also possible to host public lectures and seminars (UM.edu.mt, 2014).



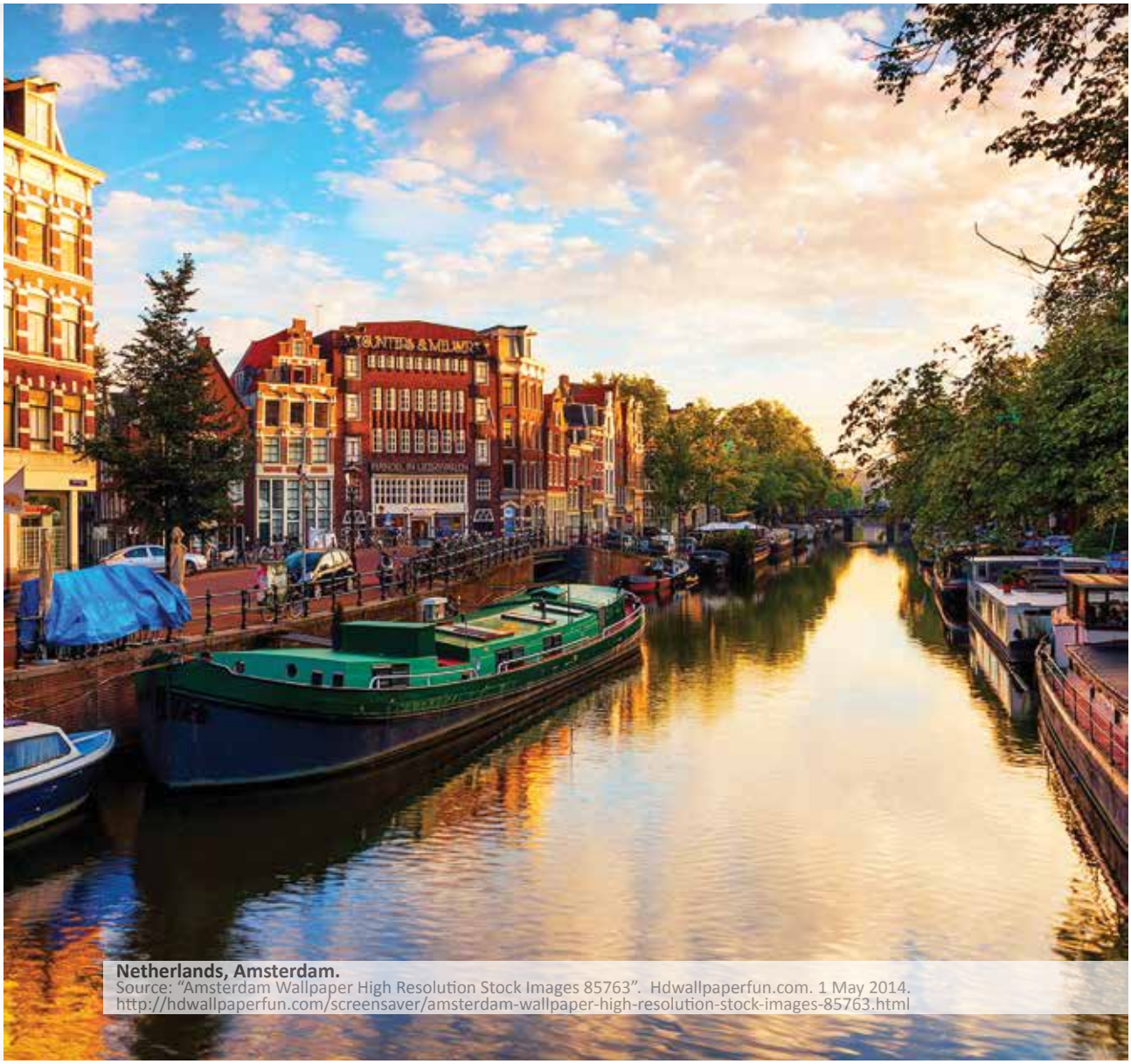







The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

Country Profile: Netherlands



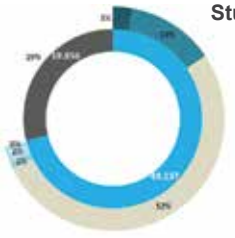
Netherlands, Amsterdam.
Source: "Amsterdam Wallpaper High Resolution Stock Images 85763". Hdwallpaperfun.com. 1 May 2014. http://hdwallpaperfun.com/screensaver/amsterdam-wallpaper-high-resolution-stock-images-85763.html

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	16,73	41.526	€ 602	5,9

Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
62	University of Amsterdam
75	Leiden University
85	Utrecht University
99	Erasmus University Rotterdam
103	Delft University of Technology
107	Maastricht University
109	University of Groningen
136	Radboud University Nijmegen
158	Eindhoven University of Technology
161	Wageningen University
177	Vrije Universiteit Amsterdam
224	University of Twente
401-450	Tilburg University

28 member states of the European Union

Country Profile: Netherlands

Users

239.755
Students

36% of the est.
higher education enrollment

Users

22.618
est. Academic Staff

11 students
per academic staff

Users

17.399
est. Administrative Staff

1,3 academic Staff
per administrative Staff

Facilities

est. 5.130.757
m^2 GFA

21,4 m^2 GFA
per student on average

Finances

€ 3.481 min.
est. Annual Expenses

€ 14.520
av. annual expenses
per student

All thirteen Dutch universities own as much as 4,5 million square meters GFA in 1.200 buildings and more than 1.200 hectares of land property. Around 60% of the GFA is 'usable floor area' (UFA) which excludes space for horizontal and vertical circulation, installation and construction. The floor area represents all buildings that are managed by the university. This ranges from about 120.000 to 680.000 square meters. The universities own most of these buildings: the maximum percentage of rented space at current campuses is 11%, at University of Amsterdam. For the total portfolio of Dutch university buildings the percentage of rented buildings is only 3%.

Beside the subdivision in rented and owned space the floor area – managed by the university – can also be classified in terms of use, on a general level : used for the primary processes, let out to other organisations – that pay rent to the university – or vacant. Erasmus University Rotterdam is on top of the list when it comes to letting out space to other organisations. The three universities of technology let out at least 10% of their floor area. The vacant space is not just space that has currently no user: it can also include space that is temporarily under construction. The vacancy rate of the total portfolio of university buildings is just 4%, acceptable as a rate that is necessary to allow reconstruction and internal relocation. But this is just the vacancy percentage on a general level, not considering the actual space utilisation rates.

Land property of the current campus ranges from 14 hectares (Amsterdam-VU) to more than 300 hectares (Utrecht). Over the years Dutch universities have changed from small institutions, physically fully integrated with urban tissue, but exclusively accessible to an intellectual elite, to large institutions that are open for the masses, but with extensive spatial consequences that required a campus on the edges of the (inner)city. The locations of buildings and land property still show the physical signs of this transition. In figure 1 this transition is illustrated in three stages that have built the current campus, roughly linked to a timeline that matches the age distribution that can still be identified when researching the campus anno 2007.

The first stage shows locations of university buildings that accommodate the elite institutions before and in the first decades after 1900. The second stage illustrates the large campus developments on the edges of the cities in the fifties, sixties and seventies. Some of the universities left the inner city buildings over the years to intensify the use of the new campus. The third stage represents the current campus

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	16,73	41.526	€ 602	5,9

and shows that the city has grown over the years. Many campuses on the edges of their cities have become part of urban fabric, again. With increasing land values as a resulting opportunity and more involvement from local government as both an opportunity – adding value to mutual goals – and a possible threat, interfering with campus planning and making decision making processes more complex.

Before looking at the city maps, it is important to realize that there is more than 400 years age difference between the oldest Dutch university (LEI, founded in 1575) and the youngest universities (UM, 1976 and OU, 1984). The age of the institutions explains which universities are most likely to have old inner city university buildings and which universities (only) have large campuses on the edge of cities, see table 2.4 and the maps of all university cities, with the locations of the campuses – land and buildings. All 'old' universities still have inner-city buildings, where the middle age group (1800-1950) have left most or all of their inner city building, focusing on their campuses elsewhere. The exception to the rule is the University of Maastricht (UM) that is a young university with old inner city buildings. Apparently the city and the university joined forces to match the accommodation demand of the university and with available characteristic inner city buildings.

The majority of the universities still manage nineteenth century or early twentieth century buildings. And even though some universities have relatively large parts of their campuses in the inner city (UU and UM), it is also interesting to put this in the perspective of the total amount of Dutch university buildings. Less than seven percent of all university buildings of the current campus was built before the 1940s. However, these old buildings are a very characteristic part of the campus, by the university population and by the city population, because they are often part of the inner city and the city's cultural heritage.

Looking at the absolute numbers the majority of Dutch university buildings was built in the sixties and seventies. The top five of contributors to this number are TUD – with 320.000 m^2 gross floor area – VU, UU, UvA and TUE (200.000 m^2 gfa). But relatively VU is on the top of the list, with more than ninety percent of their buildings from the sixties and seventies.

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus










Country Profile: Poland

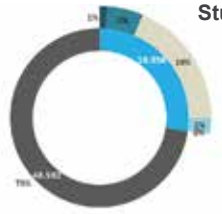
Poland, Warsaw.
Source: Globeimages.net. 1 May 2014.
http://www.globeimages.net/data/media/198/warsaw_city_picture.jpg

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	38,54	312.685	€ 370	5,1

Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
398	University of Warsaw
401-450	Jagiellonian University
601+	Lodz University
601+	Warsaw University of Technology

28 member states of the European Union

Country Profile: Poland

Users

1.000.000
Students

60% of the est.
higher education enrollment

Users

54.645
est. Academic Staff

18 students
per academic staff

Users

49.677
est. Administrative Staff

1,1 academic Staff
per administrative Staff

Facilities

est. 4.300.000
m^2 GFA

4,3 m^2 GFA
per student on average

Finances

€ 4.130 min.
est. Annual Expenses

€ 4.130
av. annual expenses
per student

In the academic year 2008/09, tertiary education in Poland was provided in 131 public and 325 private institutions (Herbst & Rok, 2010). Consulting the Polish Central Statistical Office and the report about the Polish HEIs, in the academic year 2011/2012 there were 453 HEIs in total, educating 1.676.900 students, with 73% of them enrolled in public HEIs.

Depending on the type and educational focus of each institution, there were 19 Universities with 493.400 students, 25 Technical Universities with 343.100 students, 7 Agricultural Academies with 79.400 students, 76 Academies of Economics with 224.100 students, 17 Higher Teacher Education Schools with 65.000 students, 9 Medical Universities with 60.600 students, 2 Maritime Universities 10.400 students, 6 Physical Academies 26.500 students, 23 Fine Arts Academies 17.100 students, 15 Theological Academies with 6.100 students, and 254 Other HEIs 361.400 students (GUS, 2013). The HE sector of Poland is big and rather diverse.

In general, the main source of income for the Polish HE sector is teaching, or education, bringing 84,4% and 98,3% of total revenues for public and private HEIs respectively, while research accounts for 14,8% and 0,4% respectively. Public sources in the Polish tertiary education system account for 62% of the funds for teaching activities and 82% of the funds for research activities. Tuition fees are only required for students of private HEIs (Herbst & Rok, 2010).

In Poland, only a small number of HEIs concentrates a significant part of the sector's human and financial resources. In Poland 25 Polish HEIs receives 84% of the total income from research and 60% from teaching, while 18 universities and 27 technical universities have over 50% of all academic teachers and 42% of the students (Herbst & Rok, 2010)

Examining financial statistics about universities for the period 2011/12, their revenues were €3,83bn while their expenses were €3,79bn (GUS, 2013)Thus, for each of the 1.110.924 students of the public universities, the average expenses ranged from €3.000 to €4.100. Analyzing this indicator per university type, it is observed that for students of Medicine and Fine Arts (€7.858 and €7.979 respectively) , the average expenses are almost double, compared to the abovementioned average (GUS, 2013). For the same period, the universities' cost for personnel accounted for 55,8% of their total expenses (GUS, 2013).

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	38,54	312.685	€ 370	5,1

An interesting indicator stemming out of analysis of the universities' financial data, is that of the energy costs, which is related to their campus and built infrastructure. In 2011/12 the universities' energy costs were €125min, accounting for 3,5% of their total expenses (GUS, 2013).

In terms of surface used, the average assignable space per student ranged from 0,8 to 8,9 square meters, being 3,7 square meters on average. Assuming this indicator describes well the analysed universities, it is possible to estimate the average energy cost per square meter of university facilities, which would be €31,6 per year.









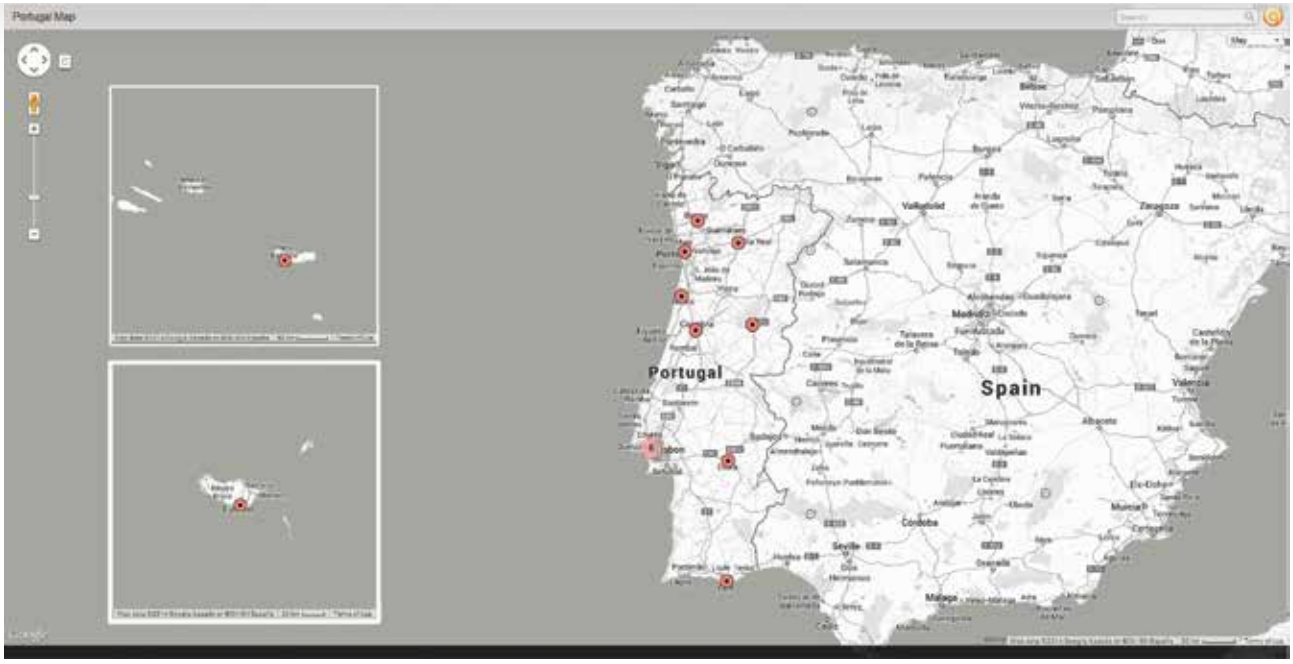

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

Country Profile: Portugal

Portugal, Lisbon.
Source: Conciergetcetera.com. 1 May 2014.
http://www.conciergetcetera.com/wp-content/uploads/2013/01/rossio.jpg

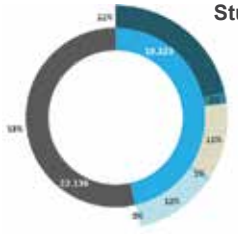
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	10,54	92.391	€ 171	5,8



Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector, as % of total student enrollment

Student mobility towards EU28, market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
385	University of Coimbra
401-450	Universidade Nova de Lisboa
401-450	University of Porto
551-600	Universidade Catolica Portuguesa, Lisboa*
551-600	University of Lisbon

28 member states of the European Union

Country Profile: Portugal

Users

230.000
Students

59% of the est. higher education enrollment

Users

15.972
est. Academic Staff

14 students per academic staff

Users

10.648
est. Administrative Staff

1,5 academic Staff per administrative Staff

Facilities

est. 3.013.000
m^2 GFA

13,1 m^2 GFA per student on average

Finances

€ 154 min.
est. Annual Expenses

€ 671
av. annual expenses per student

The Portuguese HE system is characterised by the following binary distinctions of HEIs; Universities versus Polytechnics, Public versus Private institutions and specialised, single focus versus multi-focus institutions (File, 2008).

In 2006, the Portuguese HE comprised of 14 public and 13 private universities and 15 public and 2 private Polytechnics (File, 2008). Moreover, the HE sector also included a number of public and private non-integrated schools (116 in total). Thus, in a total of 160 HEIs great diversity in size can be observed, from five multi-faculty universities graduating around 3000 students each per year to 29 private institutions with an enrolment of less than 200 students each (File, 2008).

In the academic year 2010/11, there were 403.445 students enrolled in the Portuguese HE sector. Of them, 193.106 were enrolled in public universities, 114.872 in public Polytechnics, and 88.290 in private HEIs (CRUP, 2013). According to the country's Rectors Council, "*This total number of students enrolled is the highest ever and symbolizes a remarkable change in the panorama of education in Portugal that, in the mid-60s had only about 25.000 students in higher education and in 1980 had just over 80.000 students*" (CRUP, 2013).

This increase may be attributed in the increased provision of schools which occurred in the 1990s as well as the introduction of mechanisms in accord to the Bologna Process, during the past five years (CRUP, 2013). However demographic changes will soon affect negatively student enrollment.

Even if student numbers almost doubled until mid-2000s, the demographic decline in the number of young people of Portugal (the number of 20-24 year olds is expected to decrease from 783.000 in 2000 to and 565.000 in 2020) is already getting obvious in enrollment trends .

The financing of the 14 public universities comes mostly from funds of the national budget. Besides that budget, public universities finance their activities through the use of their own income from fees, funding of research projects and community funds among others (CRUP, 2013).

Observing the operating budget of the Portuguese Public Universities for the period 2005-2011, the absolute amount of the year 2011 (€744min) is slightly lower than the one of 2005 (€746min). Its evolution shows that the operating budget was relatively stable from 2005 until 2009, whereas in 2010 there was a sharp increase (11%), which was one year later fol-

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	10,54	92.391	€ 171	5,8

lowed by a sharp decrease (7%). In terms similar to 2005, the actual budget of Portuguese Public Universities in 2011 was €647min, having been reduced by 13% (€99min) from the base year (CRUP, 2013).

Regarding the university campus, it was only possible to acquire quantitative date from the two biggest universities, the University of Lisbon and the University of Porto. The information from the university of Porto concerns facilities of 90.000 square meters, for 9 departments of Engineering and 7.000 students, resulting in 12,9 square meters of assignable surface per one student. Finally, the University of Lisbon provides 15,1 square meters per student.









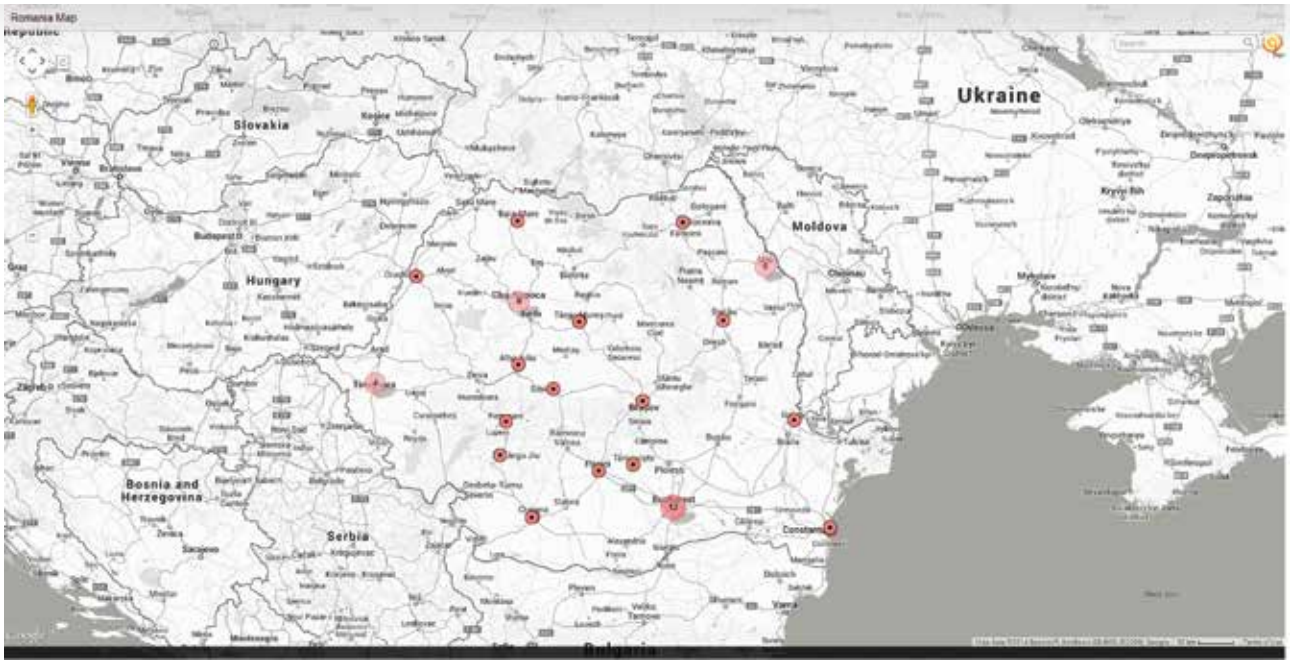

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Romania

Romania, Bran Castle.
Source: 3.bp.blogspot.com. 1 May 2014.
http://3.bp.blogspot.com/-lSd6d-bYhcE/UiJ4OaQAgeI/AAAAAAAAATA/6vAvMn-ajTc/s1600/Bran+Castle.jpg

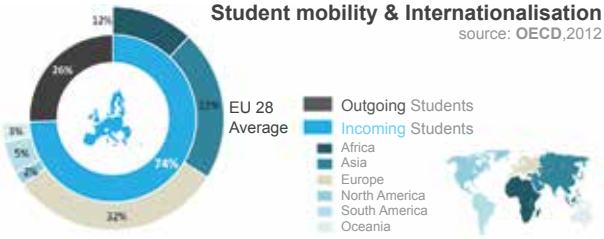
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	21,36	237.500	€ 131	4,2



Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector, as % of total student enrollment

Student mobility towards EU28, market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
601+	Alexandru Ioan Cuza University
601+	Babes-Bolyai University
601+	University of Bucharest
601+	West University of Timisoara

28 member states of the European Union

Country Profile: Romania

Users

675.000
Students

68% of the est.
higher education enrollment

Users

33.582
est. Academic Staff

20 students
per academic staff

Users

22.388
est. Administrative Staff

1,5 academic Staff
per administrative Staff

Facilities

est. 4.995.000
m^2 GFA

7,4 m^2 GFA
per student on average

Finances

€ 1.860
est. Annual Expenses

€ 2.755
av. annual expenses
per student

Romania has done much in its educational transition since the fall of communism in 1989. New subjects, western thought, and internationalized curricula have contributed to a well-rounded education for Romanian students (Pierson & Odsliv, Perspectives and Trends on Education in Romania: A Country in Transformation, 2012).

In 2009, the state higher education sector in Romania included 56 public higher education institutions and other 53 private higher education institutions (27 accredited and 26 partial accredited) (Ilie, Dumitriu, Zaharia, & Colibasanu, 2009). The university system had swelled from 192.810 university students in 1990, to over 891.000 in the 2008-2009 school year (Pierson & Odsliv, Perspectives and Trends on Education in Romania: A Country in Transformation, 2012).

Public spending on higher education has risen sharply in the past three years, driven mainly by increases in capital spending. Total public spending on higher education rose to more than 0,8% of GDP in 2007 and 2008. Approximately 64%of a public university's funding comes from the government, while 36% is raised from its own funds including fees and consulting activities, scientific research, external projects, micro production, and student accommodation (ICHEFAP, 2008).

During the research it was possible to retrieve quantitative information about the campus of 5 Romanian universities. The assignable space per student ranged from 0,6 to 13,3 square meters. On average, the same indicator was calculated as 7,4 square meters per student.

Romanian universities did not provide information about their students as much as in other countries so it is even harder to estimate the total size of their facilities. Reluctantly, and based on estimated students of the Romanian universities, 5 million square meters could be used for their accommodation.

An interesting finding comes from the University of Agricultural Sciences and Veterinary Medicine of Timișoara and the assessment report conducted by the university and EUA in 2012. The university is accommodated in 44.000 square meters, of which 40% was built after 2007 and the remaining 60% was built in 1975-1976.

This increase of space supply (161%), assuming a stable operational model between the 1970s until the 1990s, can be related with the increase in student numbers between 1990 and 2008 (300% to 450% depending on data source). As a

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	21,36	237.500	€ 131	4,2

result, we can assume either a doubled utilisation rate or half assignable space per student during the course of the last 20 years (BUASVMT, 2012).









The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

Country Profile: Slovakia

Slovakia, Bratislava.
Source: Goeasteurope.about.com. 1 May 2014.
http://0.tqn.com/d/goeasteurope/1/0/k/T/-/-/Old-Town-Bratislava-Main-Square.jpg

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	2,06	48.845	€ 69	4,1

Student mobility & Internationalisation

source: **OECD**,2012

Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University

28 member states of the European Union

Country Profile: Slovakia

Users

150.000
Students

74% of the est.
higher education enrollment

Users

8.621
est. Academic Staff

17 students
per academic staff

Users

6.158
est. Administrative Staff

1,4 academic Staff
per administrative Staff

Facilities

est. 270.000
m² GFA

1,8 m² GFA
per student on average

Finances

€ 563
est. Annual Expenses

€ 3.754
av. annual expenses
per student

Consulting the Ministry of Education, Science, Research and Sport of the Slovak Republic, the Slovakian HE system comprises of 20 public universities, 3 state universities and 13 private colleges, while it is also supported by a number of private foreign universities (Minedu.sk, 2014).

The Slovakian HE sector witnessed a remarkable expansion during the last decades, after the fall of the iron curtain. Its expansion was supported both by the already established universities, but also through the establishment of new public universities and the restructuring or merging of existing smaller HEIs into new universities (Jensen, Kralj, McQuillan, & Reichert, 2008).

Between 1989 and 2011/12, the number of undergraduate students grew from 60.567 to 204.204 (ERAWATCH, n.d.). During the analysis of the 20 public Universities, 150.780 students were counted, lacking enrollment information from 8 universities.

While student numbers (both undergraduate and PhD) were tripled, between 1989 and 2011, the share of public expenditure on higher education in GDP fell, from 0,98% to 0,62% (ERAWATCH, n.d.). State expenditure for HE was defined by State Budget Laws to €441min for 2012 and €449,9min for 2013 (ERAWATCH, n.d.).

The fall in real spending in Slovakia impacted the quality of the HE system (ERAWATCH, n.d.). Slovak HEIs are mostly focusing on teaching, while according to ERAWATCH, the quality of research by most HEIs is medium-low, a situation which is negatively influenced also by the sector's recent financial capacity. Next to that, Slovakia is ranked among the countries with the highest emigration rates, which might be assumed as a consequence of the sector's challenges. In 2010, more than 38.000 Slovak tertiary students studied abroad, being 16,3% of total HE students (ERAWATCH, n.d.).

During the analysis of the 20 public universities, it was possible to retrieve information about the campus of one institution. Students and staff of the University of Constantine the Philosopher (CPU) in Nitra, use 7.558 square meters educational buildings, 953 square meters of laboratories, 2.137 square meters of other specialized classrooms, three gyms of a total area of 878 square meters and 8.915 square meters of office space and meeting rooms (CPU, 2006).

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	2,06	48.845	€ 69	4,1

This results in 1,8 square meters of assignable space per student. Moreover, this information also serves as an indication of the universities mix of provided functions, which in the specific case are mostly focused on the educational needs of the university.

Moreover, in 2006 EUA and the CPU acknowledged that the university's infrastructure was "far from optimum" (CPU, 2006). At this time, The university owned 16 buildings, out of which 13 were situated in Nitra and two in other locations. Of the university's real estate, 3 buildings (19%) were up to 20 years old, 4 buildings (25%) were up to 30 years old, 3 buildings (19%) were up to 40 years old, 3 buildings (19%) were up to 50 years old and 3 buildings were (19%) more than 50 years old. Some of the older buildings had been partially or fully reconstructed (CPU, 2006).

Considering that Slovak universities lack abundant financial resources and an –up to date – increasing demand for HE, they will soon have to address challenges such as their ageing existing facilities as well as derived increased demand for space, both in quantity and quality.









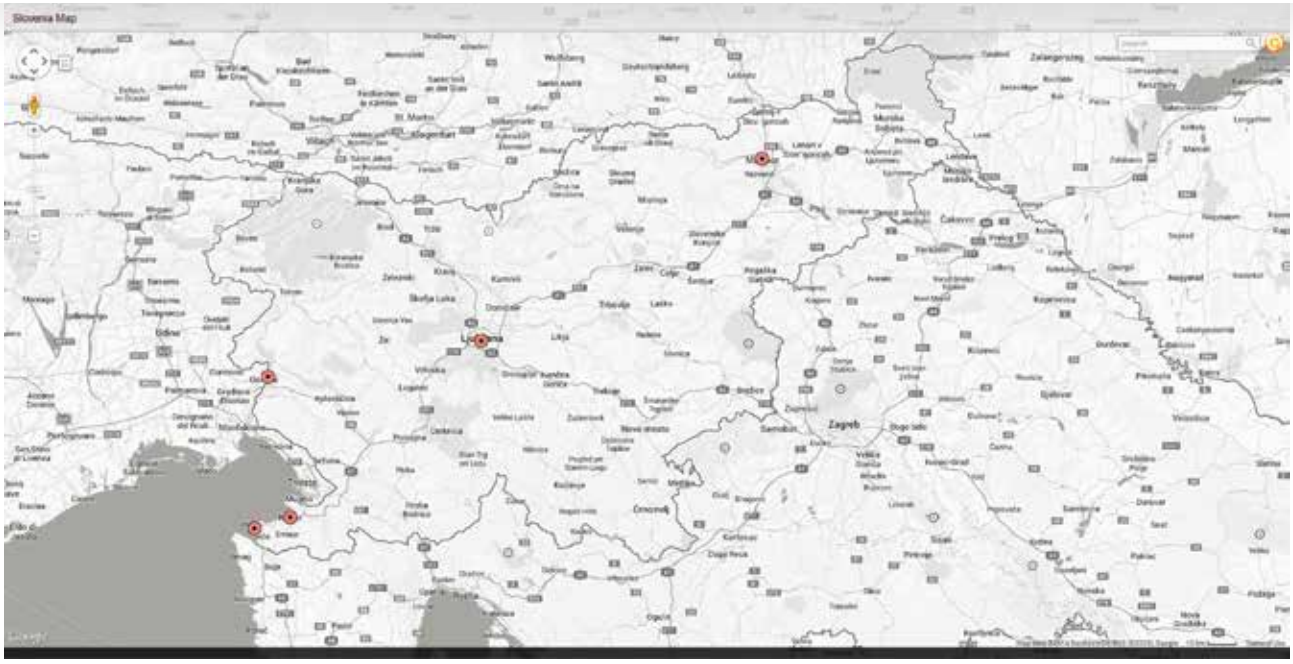

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Slovenia

Slovenia, Ljubljana.
Source: UMSL.edu. 1 May 2014.
http://www.umsl.edu/services/abroad/MAUI-Utrecht%20Network/maui_pix/Ljubljana%20center.JPG

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	5,4	20.273	€ 36	5,7



Student mobility & Internationalisation

source: **OECD**,2012

Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University

28 member states of the European Union

Country Profile: Slovenia

Users

75.391
Students

100% of the est. higher education enrollment

Users

4.120
est. Academic Staff

18 students per academic staff

Users

3.433
est. Administrative Staff

1,2 academic Staff per administrative Staff

Facilities

est. 384.494
m^2 GFA

5,1 m^2 GFA per student on average

Finances

€ 377
est. Annual Expenses

€ 5.000
av. annual expenses per student

The Slovenia HE sector comprises of several types of HEIs, namely Universities, Faculties, Art Academies and independent Higher Education Institutions (samostojni visokošolski zavodi). As per January 2011, there were 3 public universities, 1 public independent institution of higher education, 2 private universities (one of which is international) and 29 independent higher education institutions (CMEPIUS, 2011)

Since 1991, the total number of students was more than tripled, from 38.151 students in 1991 to 114.873 in the academic year 2009/10. However, student enrollment reached its peak in the academic year 2006/07. Then, it was slightly declined until 2008/09, growing again in the academic year 2009/10 without reaching the levels of 2006/7 (Komljenovič & Marjetič , 2010).

During the analysis of the 5 Slovenian universities, 75.391 students were counted. By examining the student enrollment of the three biggest Slovenian universities (Ljubljana, Maribor and Primorska) , the abovementioned trend can be confirmed, even before 2006. In 2005, all three universities had the maximum student population, which began to decline by the following year.

In Slovenia, HE funding began to decline in 2012, as a result of the national budget "rebalance" (Rebalans proračuna, 2012 in Skrbinjek and Lesjak, 2013). Before 2012, public funding was progressively growing until 2011, when a maximum was reached. Public expenditure for HEIs grew from €160 min in 2003, to €259 min in 2011, while in 2013, it was decreased to €227 min.

These reductions were the result of indirect effects of the financial crisis. However, on the bright side, public expenditure for HE in Slovenia decreased more gradually than in other eastern and southern European countries (Skrbinjek & Lesjak, 2013).

With respect to the universities' campus, it was possible to retrieve information for two institutions; the University of Primorska and the University of Maribor. The University of Primorska is faced with problems associated with lack of adequate space for teaching and research activities as well as student housing.

As a response a medium-term investment plan for the period 2012 - 2016 was adopted, through which the university will solve spatial problems and provide student accommoda-

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	5,4	20.273	€ 36	5,7

tion (UP, 2013). From its annual report of 2012, the University of Primorska is located in two campuses, using a total of 20.575 square meters. Moreover, 65% of these facilities are dedicated to Education and 35% to Research activities.

The university owns 74% of the used space, it leases 26% from external parties while a 5% of its space is let out (UP, 2013). The University of Maribor uses a 110 years old historic building of 688 square meters in the city centre, for conferences and exhibitions.

Moreover it also uses buildings in various locations in the city of Maribor, in a total used surface of 139.058 square meters for Academic purpose and 45.754 square meters of student housing (UM, 2014). Moreover, there is indication of the value attached -and the potential financial benefits- of this historic building, as the university shows an entrepreneurial approach, leasing this space to external parties for various purposes (UM, 2012).










The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

28 member states of the European Union

Country Profile: Spain

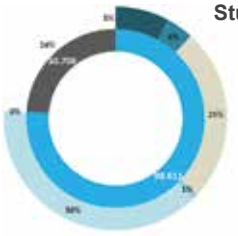
Spain, Madrid.
Source: Hothdwallpaper.com. 1 May 2014.
http://static.hothdwallpaper.net/51a4673e9751126021.jpg

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	46,2	504.782	€ 1.063	5,0

Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector, as % of total student enrollment

Student mobility towards EU28, market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
176	Universitat Autónoma de Barcelona
187	Universitat de Barcelona (UB)
206	Universidad Autónoma de Madrid
226	Universidad Complutense de Madrid (UCM)
266	Universitat Pompeu Fabra
343	Universidad Carlos III de Madrid
350	Universitat Politècnica de Catalunya
359	Universidad de Navarra
401-450	Universidad Politecnica de Valencia
451-500	4 Universities (Valencia, Madrid, Granada, Salamanca)
501-550	Universidad de Zaragoza
551-600	Universidad de Sevilla
601+	2 Universities

28 member states of the European Union

Country Profile: Spain

Users

1.547.505
Students

85% of the est.
higher education enrollment

Users

124.799
est. Academic Staff

12 students
per academic staff

Users

59.428
est. Administrative Staff

2,1 academic Staff
per administrative Staff

Facilities

est. 14.391.796
m^2 GFA

9,3 m^2 GFA
per student on average

Finances

€ 10.794
est. Annual Expenses

€ 6.975
av. annual expenses
per student

Spain has a total of 77 universities, of which 50 are public; they are spread out over 232 campuses of which 21 offer distance learning. In 2008-09 there were 1,5 million university students in total (OECD, 2010).

In the academic year 2010/11 1,3 million students were enrolled in public universities (CRUE, 2012). For the same academic year, Spanish public universities had 155.000 employees, 65% as academic staff (teaching and research staff , PDI) and 35% administrative staff (Administration and Services ,PAS).

In 2010, the total financial resources of the Spanish public universities were 10 billion euros, 81% of them transferred to them by the (educational) authorities and 19% of them generated by them (CRUE, 2012).

In 2010 all the public universities had an area of buildings and facilities 12,8 million square meters, of which 28,6% was for the education (3,7 million square meters for classrooms and laboratories). The number of classrooms was 15.517, with 901.127 positions, resulting in classrooms of average capacity for 58 students.

Regarding research, there were 15.272 laboratory spaces, with 144.367 positions (CRUE, 2012). During the research it was possible to retrieve quantitative information about the campus of 8 Spanish universities. The assignable space per student ranged from 3,1 to 16,0 square meters. On average, the same indicator was calculated as 9,3 square meters per student.

International campus of Excelence

Depending on the geographical location of the campus (urban, metropolitan, regional) and the distribution of campuses per autonomous community (region with only one university with several campuses in the region, or region with several universities), there are different types of university campuses. These range from the local “mono-campus” to the regional or global “multi-campus” (OECD, 2010) Catalonia, Madrid and Andalusia account for almost 75% of the total number of university campuses (OECD, 2010).

Within the framework of SU-2015, a new programme called International Campus of Excellence (CEI) was launched in July 2009. CEI’s overarching goal is to make Spanish university campuses among the best in Europe, to promote their in-

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	46,2	504.782	€ 1.063	5,0

ternational renown and enhance the strengths of the Spanish university system. It aims to improve the quality of teaching and research in Spanish universities and incubate. It fosters public and private strategic aggregations among universities, other research institutions and businesses located within the campus (OECD, 2010).

Thanks to CEI, a new concept of the university campus has evolved, involving interaction between universities and research and technological centres, scientific and technological parks, businesses and other agents. This interaction should facilitate the development of territorial education, research and innovation communities.

This new concept aims to promote campuses which are socially and economically integrated within their surrounding urban or regional area. The campus will need to make efforts to achieve high quality services and environmental sustainability, so that that it will increase the attractiveness of the area for international students, academics and researchers as well as for knowledge-related investors (OECD, 2010).









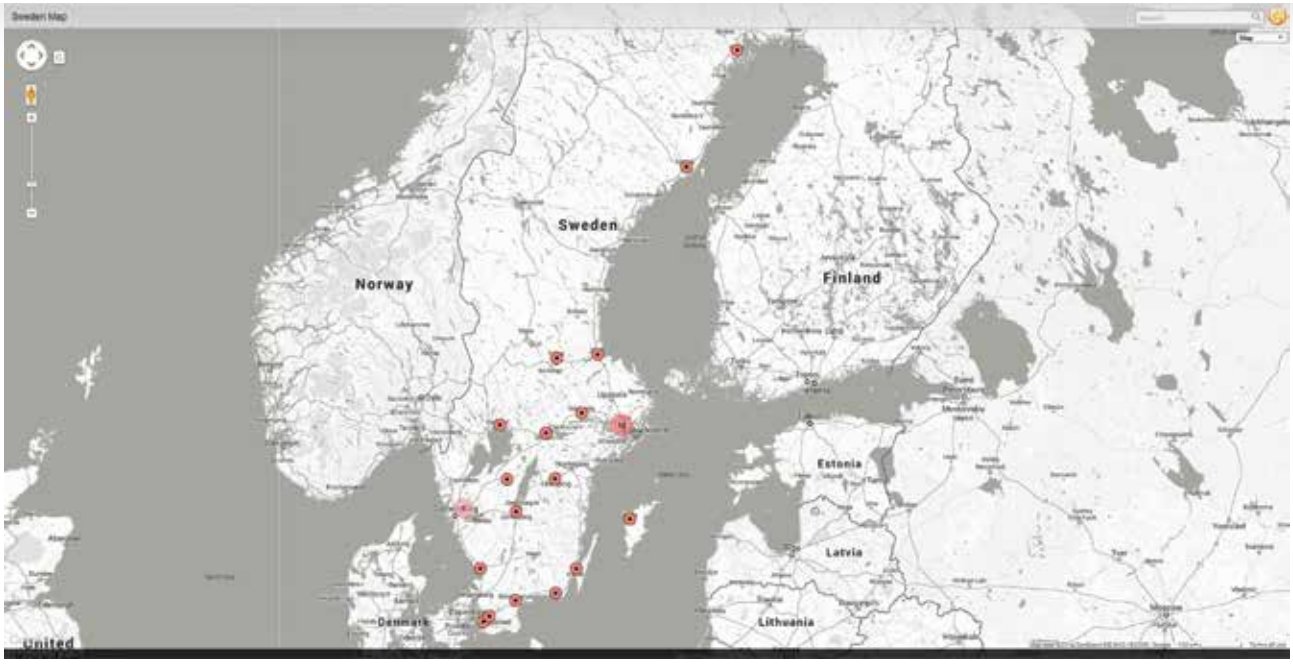

The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus

Country Profile: Sweden

Sweden, Stockholm.
Source: Europesgreatest.com. 1 May 2014.
http://www.europesgreatest.com/files/1307556161-stockholm1.jpg

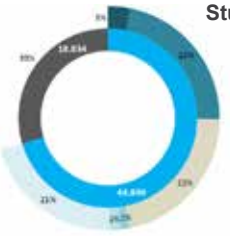
28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	9,48	449.964	€ 388	7,3

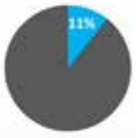


Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector, as % of total student enrollment



Student mobility towards EU28, market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
71	Lund University
81	Uppsala University
142	KTH, Royal Institute of Technology
171	Stockholm University
193	University of Gothenburg
223	Chalmers University of Technology
297	Umeå University
340	Linköping University

28 member states of the European Union

Country Profile: Sweden

Users

390.000
Students

100% of the est. higher education enrollment

Users

24.224
est. Academic Staff

16 students per academic staff

Users

9.317
est. Administrative Staff

2,6 academic Staff per administrative Staff

Facilities

est. 5.772.000
m^2 GFA

14,8 m^2 GFA per student on average

Finances

€ 8.000
est. Annual Expenses

€ 20.520
av. annual expenses per student

There are 14 public-sector universities and 20 public-sector university colleges in Sweden. In addition there are three independent HEIs that are entitled to award third-cycle qualifications: Chalmers University of Technology, the Stockholm School of Economics and Jönköping University Foundation (HSV, 2012).

After several years with negative results at the beginning of the millennium, which had a negative impact on their balance sheets, the HEIs cut back operations in the middle of the first decade of this century. Fewer entrants were admitted to third-cycle programmes and staff reductions were made. After 2008 there were three years with a financial surplus (HSV, 2012).

Revenues of the HEIs have increased substantially in the last few years, expenditure has also risen but not at the same rate and capital carried forward doubled, from SEK 5bn to SEK 10bn. During the last four years HEIs are in an expansive phase in both revenues and expenditure. After a rise of SEK 3.7bn in current prices, expenditure on education and research totalled SEK 58,4bn in 2011. During 2011 HEI expenditure amounted to 1,67% cent of Sweden's GDP (HSV, 2012).

Over a period of ten years the number of entrants has risen by almost 50%, from 72.000 in the academic year of 2000/01 to 106.000 in 2010/11. In the autumn semester of 2011 there were 363.000 (387.500 for the research in 2013 for the whole Swedish HE sector) students taking first and second-cycle courses and programmes in higher education.

The number of students has declined by 2% cent compared to the autumn semester of 2010. However this is partially related to Reduced number of places on offer by the HEIs, adapting to impending reduced funding (HSV, 2012).

In Sweden, Akademiska HUS, a real estate company owned by the state and with a market share of 63% is the leading provider of premises to universities and colleges (Akademiska HUS, 2013). Based on the reported facts of 2012 regarding ten HEIs, it is possible to have an image of the Swedish facilities. It is estimated that Swedish HEIs are accommodated in 5 to 6 million square meters with an estimated cost of €876 million.

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	9,48	449.964	€ 388	7,3

The total cost of ownership ranges from 9% to 32% of the HEIs budget, 15% on average (Akademiska HUS, 2013). The assignable square meters per student range from 6 to 40, with an average of 15. Both indicators are related with the academic profile of HEIs, thus the functional requirements of the used facilities (Akademiska HUS, 2013).










The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online: www.managingtheuniversitycampus.nl/european-campus

28 member states of the European Union

Country Profile: United Kingdom

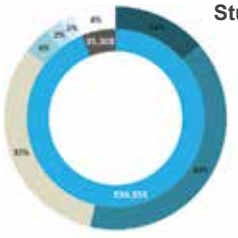
United Kingdom, London.
Source: "Big Ben pc desktop background". Wallpapervortex.com. 1 May 2014. http://www.wallpapervortex.com/wallpaper-42175_london_big_ben.html#.VBfpE_k0VcY

28 member states of the European Union

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	62,99	244.820	€ 1.747	5,7

Student mobility & Internationalisation

source: **OECD**,2012



Internationalisation of HE sector,
as % of total student enrollment

Student mobility towards EU28,
market share % of total incoming students

Rankings of national Universities

Universities ranked among the top 600 in the world

Based on the **QS University Rankings**, 2012-2013

Rank 2012/13	University
2	University of Cambridge
4	UCL (University College London)
5	University of Oxford
6	Imperial College London
21	University of Edinburgh
26	King's College London (KCL)
28	University of Bristol
32	The University of Manchester
54	University of Glasgow
55-100	9 Universities
101-200	12 Universities
201-300	8 Universities
301-500	12 Universities
501-600	5 Universities

28 member states of the European Union

Country Profile: United Kingdom

Users

2.041.715
Students

82% of the est.
higher education enrollment

Users

145.837
est. Academic Staff

14 students
per academic staff

Users

162.041
est. Administrative Staff

0,9 academic Staff
per administrative Staff

Facilities

est. 26.542.295
m^2 GFA

13,0 m^2 GFA
per student on average

Finances

€ 33.688
est. Annual Expenses

€ 16.500
av. annual expenses
per student

In the UK, all HEIs with degree-awarding powers, granted by a royal charter or by Act of Parliament are known as "recognised bodies", including all 160 British universities and a number of Higher Education and Specialist Colleges. Next to the recognised HEIs, there are more than 700 Colleges and other HEIs without degree-awarding powers, which however provide education leading to recognised degree qualifications known as 'listed bodies' (Baskerville, 2013).

British HEIs are independent legal entities and are neither owned or run by the government. The strategic course and their financial and general management is the responsibility of Councils or Governing Bodies. The majority of British HEIs receive only a portion of their income from the national government. These funds are indirectly distributed to British HEIs through independent Funding Councils which are responsible for both financial support and general guidance to the HEIs (Baskerville, 2013).

The HE sector of UK generates annually around £60bn, some 2,3% of the country's GDP (Baskerville, 2013). In 2010/11 the sector received a total of £28bn for its funding needs. Almost one third of it came from BIS (department for Business, Innovation and Skills) and was distributed to the HEIs as grants by the national funding bodies (Baskerville, 2013). Funding through the Funding Councils represents the second largest single source of income to HEIs, after Tuition Fees and Education Contracts, though across the sector universities will vary in the percentage of their overall funding that they received from public sources (Baskerville, 2013). The majority of HEIs' funding is allocated by the Funding Councils for teaching and research, based on set formulae. Funding for teaching depends on the student numbers and the variety of subjects taught, while funding for research is related to its quality and volume (Baskerville, 2013).

In 2011-2012, there were 2,5 million students enrolled on degree programmes at Britain's HEIs, of whom 435.235 were from overseas and 302.685 had a 'legal domicile' outside the European Union (Baskerville, 2013). The UK is the most popular student destination in Europe (32% of the European market) and second most popular destination worldwide, after the United States (13% of the international student market. In 2008-2009, international students brought almost £7billion into the British HEIs, playing a central role in the nation's cultural, social and business life (Baskerville, 2013).

Between 2001 and 2012, the total number of students in-

Demographics	Population (min. inhabitants)	Surface (km^2)	GDP (bn Euros)	GDP for Education (% of GDP)
	62,99	244.820	€ 1.747	5,7

creased by 28% (HESA, 2014). However, looking at the first year enrolment, between 2008 and 2009 a decline of 13% is observed (HESA, 2014). However, there is a recent recovery in the numbers of full-time undergraduate entrants, growing by 8% in 2013/14 (HEFCE, 2014).In 2011/12, UK HEIs employed 117.845 full-time and 63.540 part-time academic staff, a total 181.385 academic staff .This results in 14 students per one academic staff. At the same period, 196.860 non-academic or administrative staff were employed at the UK HEIs . The total staff employed by the UK HEIs was 378.250, a nine percent increase compared to 2004/05 (Baskerville, 2013).

In the UK, Association of University Directors of Estates (AUDE) is responsible for the strategic planning, management, operation and development of HE real estate (AUDE, 2014). During the research it was possible to retrieved and analyse the complete picture of the British universities' real estate both through AUDE and HESA's "Estates Management Record" Based on recent AUDE publications, some key quotes regarding UK's university facilities.

"The higher education sector has a gross internal area of nearly 26 min m^2 of space with over 3 million m^2 dedicated to research. The total value of the estate is difficult to estimate, however the Insurance Replacement Value (IRV) is over £60 billion. The total revenue property costs are £2,3 billion per annum, of which £736 million is spent on maintenance. The sector has 250.000 beds in residential accommodation owned and managed by universities and a further 66.000 in third party accommodation. AUDE members have over the past five years spent on average over £2 billion per year on capital works. Estates and Facilities Management departments employ almost 10% of the higher education workforce. Total sector income is £25,2 billion" (AUDE, 2013).

"The total spent on property has remained at 6% - 7% of income since 2001. This is despite substantial increases in energy costs. Energy use has remained constant. This is likely to be the result of effective sustainability programmes aimed at energy reduction, coupled with an otherwise inexorable increase in demand for energy.Since 2008/09 Total Property Costs have been static, despite substantial upward pressure. This has come from; continued increase in GIA, continued (albeit smaller) increase in income in the sector, increasing costs (particularly energy and imported materials), space with more complex facilities such as IT and cooling, and greater utilisation of that space" (AUDE, 2013).

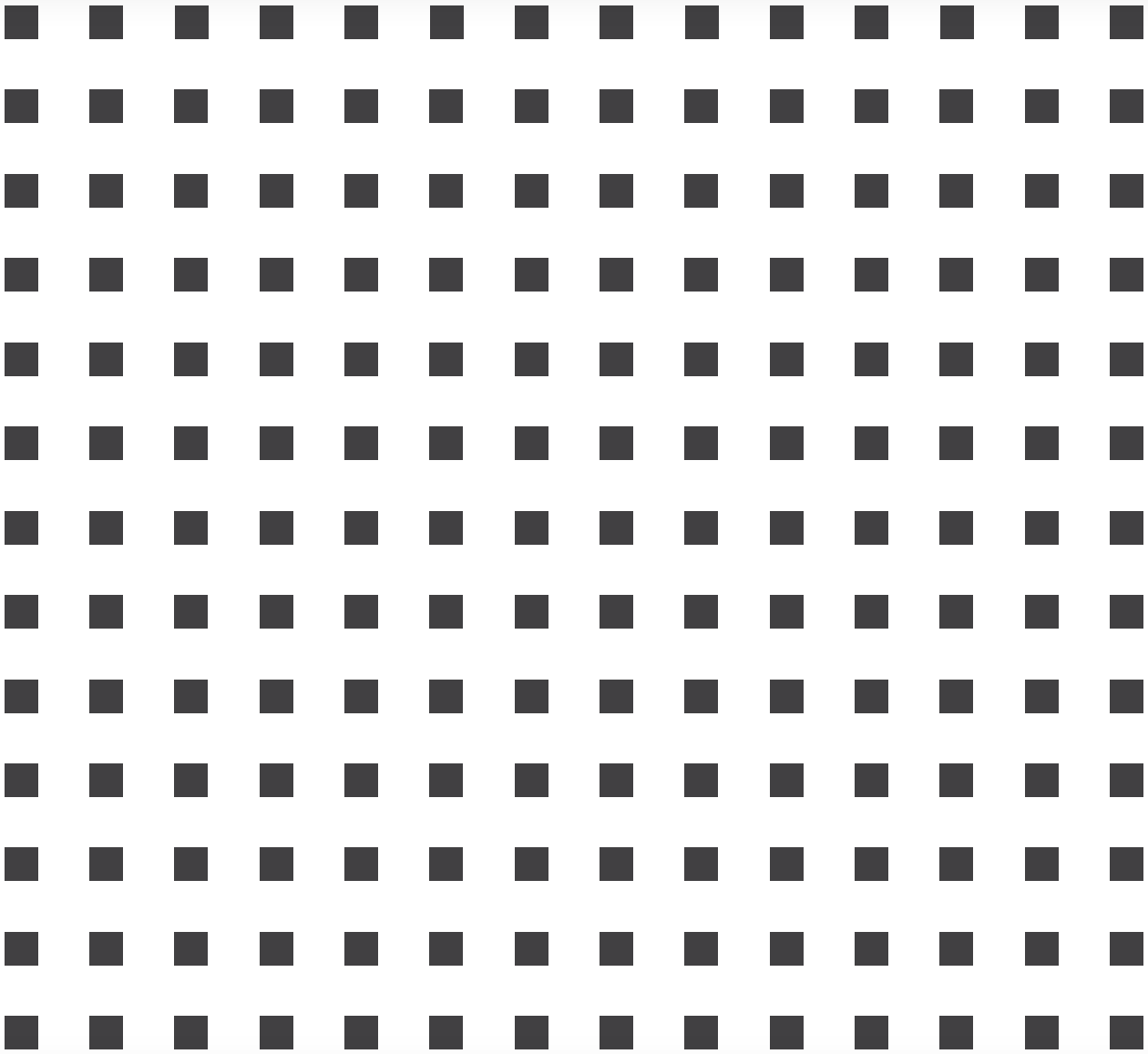
The photos on the right are used to illustrate unique qualities of campuses in this country, a random selection - more photo info (sources, links to universities, background about some projects) can be found online:
www.managingtheuniversitycampus.nl/european-campus









Part C

Regions:	Balkans	Baltic States	British Isles
Students			
Total	1.045.000	237.000	2.143.000
Bulgaria	220.000	Estonia 49.000	Ireland 103.000
Croatia	150.000	Latvia 51.000	United Kingdom 2.040.000
Romania	675.000	Lithuania 137.000	
Students per Academic Staff			
Average	21	14	14
Bulgaria	24	Estonia 10	Ireland 14
Croatia	19	Latvia 20	United Kingdom 14
Romania	20	Lithuania 12	
m² per Student			
Average	6,0	10,3	12,7
Bulgaria	6,9	Estonia 10,3	Ireland 12,4
Croatia	3,8	Latvia *Not Found*	United Kingdom 13,0
Romania	7,4	Lithuania *Not Found*	
€ per Student			
Average	€ 1.810	€ 4.733	€ 15.650
Bulgaria	€ 1.500	Estonia € 6.400	Ireland € 14.800
Croatia	€ 1.175	Latvia € 3.800	United Kingdom € 16.500
Romania	€ 2.755	Lithuania € 4.000	
Crisis impact Nominal change in public funding for HE 2008-2012			
Average	0%	-8%	-15%
Bulgaria	-2%	Estonia -2%	Ireland -20%
Croatia	5%	Latvia -2%	United Kingdom -10%
Romania	-2%	Lithuania -19%	

Central Europe

Total	**3.689.000**
Austria	300.000
Czech Republic	320.000
Germany	1.600.000
Hungary	244.000
Poland	1.000.000
Slovakia	150.000
Slovenia	75.000

Average	**16**
Austria	14
Czech Republic	13
Germany	13
Hungary	15
Poland	18
Slovakia	17
Slovenia	18

Average	**7,0**
Austria	12,2
Czech Republic	5,0
Germany	12,4
Hungary	8,7
Poland	3,7
Slovakia	1,8
Slovenia	5,1

Average	**€ 6.843**
Austria	€ 14.682
Czech Republic	€ 4.171
Germany	€ 13.665
Hungary	€ 2.500
Poland	€ 4.130
Slovakia	€ 3.754
Slovenia	€ 5.000

Average	**-2%**
Austria	-2%
Czech Republic	-14%
Germany	23%
Hungary	-20%
Poland	12%
Slovakia	2%
Slovenia	-0,12

Nordic Countries

Total	**715.000**
Denmark	160.000
Finland	165.000
Sweden	390.000

Average	**13**
Denmark	12
Finland	11
Sweden	16

Average	**15,1**
Denmark	19,5
Finland	11,1
Sweden	14,8

Average	**€ 20.207**
Denmark	€ 24.700
Finland	€ 15.400
Sweden	€ 20.520

Average	**6%**
Denmark	-2%
Finland	-2%
Sweden	22%

Southern Europe

Total	**3.863.000**
Cyprus	12.000
Greece	360.000
Italy	1.700.000
Malta	11.000
Portugal	230.000
Spain	1.550.000

Average	**22**
Cyprus	15
Greece	42
Italy	33
Malta	14
Portugal	14
Spain	12

Average	**9,5**
Cyprus	11,9
Greece	5,7
Italy	7,5
Malta	*Not Found*
Portugal	13,1
Spain	9,3

Average	**€ 3.901**
Cyprus	€ 1.800
Greece	€ 545
Italy	€ 8.164
Malta	€ 5.250
Portugal	€ 671
Spain	€ 6.975

Average	**-9%**
Cyprus	-2%
Greece	-25%
Italy	-12%
Malta	-2%
Portugal	-2%
Spain	-10%

Western Europe

Total	**1.952.000**
Belgium	200.000
France	1.500.000
Luxemburg	12.000
Netherlands	240.000

Average	**17**
Belgium	8
France	19
Luxemburg	29
Netherlands	11

Average	**15,9**
Belgium	*Not Found*
France	10,3
Luxemburg	16,0
Netherlands	21,4

Average	**€ 11.837**
Belgium	€ 8.300
France	€ 11.729
Luxemburg	€ 12.800
Netherlands	€ 14.520

Average	**9%**
Belgium	19%
France	9%
Luxemburg	-2%
Netherlands	10%

Regions:	Balkans	Baltic States	British Isles
Students	Comparing the university student body, the region consists of two Small (Bulgaria and Croatia) and one Large (Romania) university sector. The regions is ranked fifth in terms of student population, comparable in size with Nordic Countries. In the following years, the region's student population would be expected to remain relatively unchanged, if not slightly reduced.	Comparing the university student body, the region consists of two Extra Small (Estonia and Latvia) and one Small (Lithuania) university sector. The regions is ranked seventh in terms of student population, the smallest of all regions. In the following years, the region's student population would be expected to decrease, affected by the demographic downturn. In Latvia and Lithuania the expected decrease is estimated around 30%.	Comparing the university student body, the region consists of one Small (Ireland) and one Extra Large (United Kingdom) university sectors. The regions is ranked third in terms of student population, comparable in size with Western Europe. In the following years, the region's student population would be expected to remain relatively unchanged.
Students per Academic Staff	In terms of teaching capacity, the number of students per one academic staff is high (21), compared to other EU28 countries. In fact, the region scores higher only to Southern Europe, ranked in the sixth place. In EU28, the region can be characterised as understaffed in terms of academic staff, a fact that will put pressure on both the education and research capacity of the region's universities.	In terms of teaching capacity, the number of students per one academic staff is low (14), compared to other EU28 countries. In fact, the region scores lower only to Nordic Countries, sharing the second place with British Isles. In EU28, the region can be characterised as sufficiently staffed, or moderately overstaffed in terms of academic staff.	In terms of teaching capacity, the number of students per one academic staff is low (14), compared to other EU28 regions. In fact, the region scores lower only to Nordic Countries, sharing the second place with Baltic States. In EU28, the region can be characterised as sufficiently staffed, or moderately overstaffed in terms of academic staff.
€ per Student			
Crisis Impact Nominal change in public funding for HE 2008-2012	Measuring the financial capacity of the region in terms of total expenses per student, again Balkans shown in the lowest place, ranked seventh with €1.810 per student on average. Compared to other regions, the level of funding is similar only to Cyprus, a country with an extra small student body though. The regions can be characterised as underfunded. The financial crisis, has not heavily affected the region, and in fact Croatia, the last EU28 member state, witnessed a 5% increase in HE between 2008 and 2012.	Measuring the financial capacity of the region in terms of total expenses per student, Baltic States ranked in the fifth place, with €4.733 per student on average. Compared to other regions, the level of funding is similar to the average of Southern Europe, a region with almost sixteen times higher student population. The regions can be characterised as underfunded. The financial crisis, has negatively affected the region with an average 8% reduction, and a remarkable 19% reduction in Lithuania, between 2008 and 2012.	Measuring the financial capacity of the region in terms of total expenses per student, British Isles ranked in the second place, with €15.650 per student on average, fuelled at least by one third through tuition fees. Compared to other regions, the level of funding is between Western Europe and the Nordic Countries. Even if the regions' public funding for HE declined by 15% on average (in the UK) between 2008 and 2012, it was counterbalanced by increased tuition fees, and was the result of proactive adaptive measures at the beginning of the financial crisis.

Central Europe	Nordic Countries	Southern Europe	Western Europe
Comparing the university student body, the region consists of one Extra Small (Slovenia) two Small (Slovakia and Hungary), two Medium (Austria and Czech Republic), one Large (Poland) and one Extra Large (Germany) university sectors. The regions is ranked second, close to Southern Europe. In the following years, the region's student population would be expected to remain relatively unchanged.	Comparing the university student body, the region consists of two Small (Denmark and Finland) and one Medium (Sweden) university sectors. The regions is ranked sixth in terms of student population, comparable in size with Balkans. In the following years, the region's student population would be expected to remain relatively unchanged, if not slightly increased.	Comparing the university student body, the region consists of two Extra Small (Cyprus and Malta), one Small (Portugal), one Medium (Greece) and two Extra Large (Italy and Spain) university sectors. The regions is ranked first in terms of student population, slightly larger than Central Europe. In the following years, the region's student population would be expected to remain relatively unchanged.	Comparing the university student body, the region consists of one Extra Small (Luxemburg), two Small (Belgium and Netherlands) and one Extra Large (France) university sectors. The regions is ranked fourth in terms of student population, comparable in size with British Isles. In the following years, the region's student population would be expected to remain relatively unchanged.
In terms of teaching capacity, the number of students per one academic staff is average (16) and relatively homogenous between the 7 countries of the region . Central Europe is ranked in the third place, characterised as sufficiently staffed in general.	In terms of teaching capacity, the number of students per one academic staff is low (13), compared to other EU28 regions. In fact, the region scores higher than every other region, ranked in the first place. In EU28, the region can be characterised as at least sufficiently staffed.	In terms of teaching capacity, the number of students per one academic staff is very high (22), compared to other EU28 regions. In fact, the region scores lower than any other EU28 region, ranked in the last place. In EU28, the region can be characterised as understaffed, as a result of restructuring measures in response to the financial crisis.	In terms of teaching capacity, the number of students per one academic staff is rather high (17), compared to other EU28 regions. In fact, the region scores higher only to Southern Europe and Balkans. In EU28, the region can be characterised as moderately understaffed, at least France, compared with the remaining four countries of similar size (Germany, Spain and United Kingdom). On the other hand, Belgium and Netherlands are at least sufficiently staffed.
Measuring the financial capacity of the region in terms of total expenses per student, Central Europe ranked fourth with €6.843 per student on average. However the same indicator only for Austria and Germany is on average €14.173. This is because the region is characterised by differences between the former Socialistic countries and the German speaking countries. Thus, compared to other regions, the level of funding for former Socialistic countries is similar to the Baltic States, while for Austria and Germany, similar to British Isles.	Measuring the financial capacity of the region in terms of total expenses per student, Nordic Countries ranked first with €20.207 per student on average. Compared to other regions, the level of funding is comparable to British Isles. The regions can be characterised as well funded. The financial crisis, has not significantly affected the region, and in fact Sweden, witnessed a 22% increase in HE funding between 2008 and 2012, as a result of proactive adaptive measures taken in the beginning of the millennium.	Measuring the financial capacity of the region in terms of total expenses per student, Southern Europe ranked sixth with €3.901 per student on average. In this region, Italy and Spain still maintained a higher level of expenditure compared to other smaller countries. However, for these two countries, the same indicator is considerably lower in comparison to other countries of similar size (France, Germany and United Kingdom). This is also associated with the impact of the financial crisis to this region, which reduced HE funding by 9% on average, between 2008 and 2012.	Measuring the financial capacity of the region in terms of total expenses per student, Southern Europe ranked third with €11.837 per student on average. Despite the financial crisis, Western Europe has increased HE funding by 9% on average between 2008 and 2012, only with the exception of Luxemburg (2% decrease).

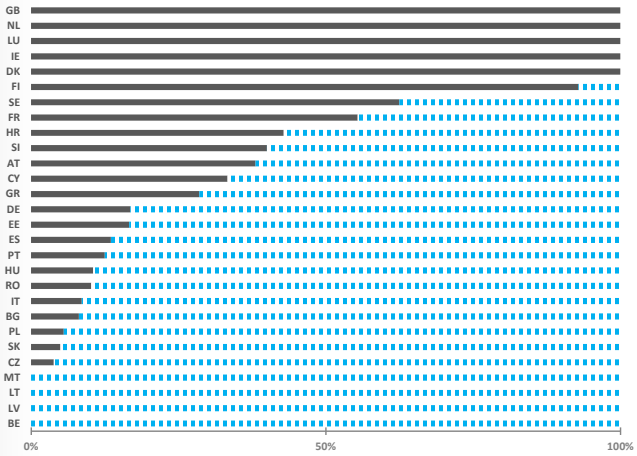
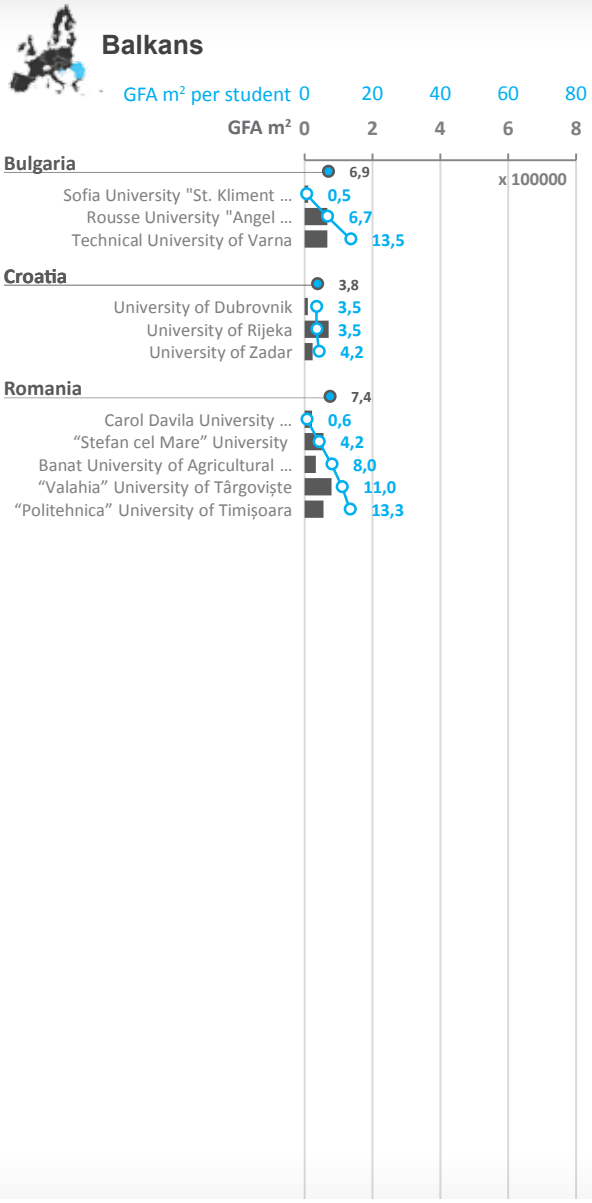


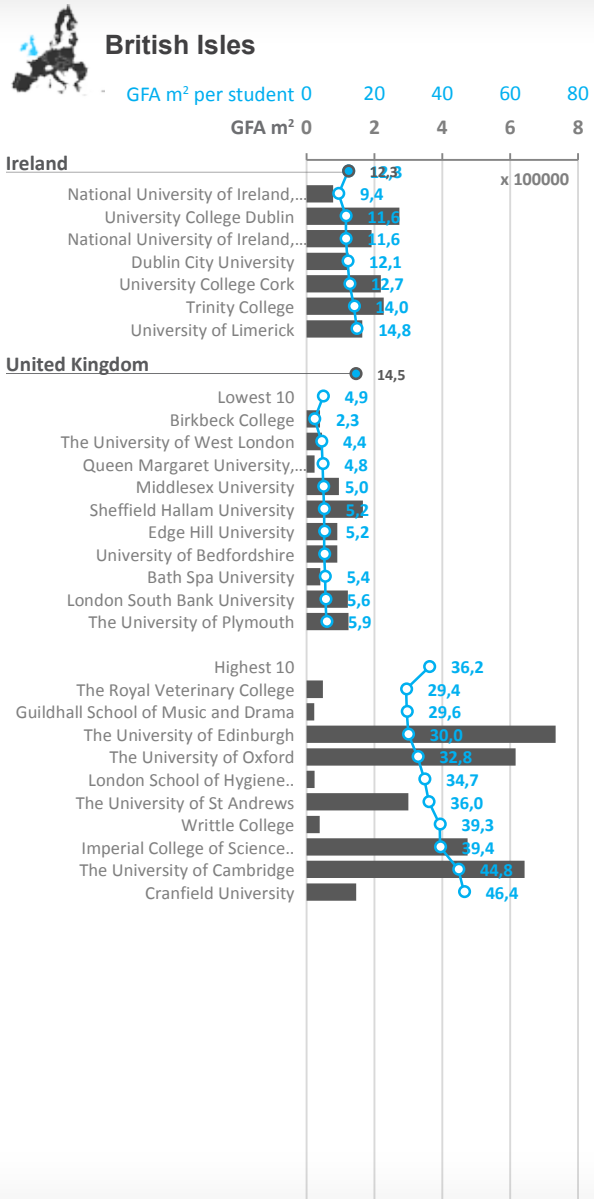
Figure 7.
Availability of quantitative information about the real estate of universities, for the 28 member states of the EU.

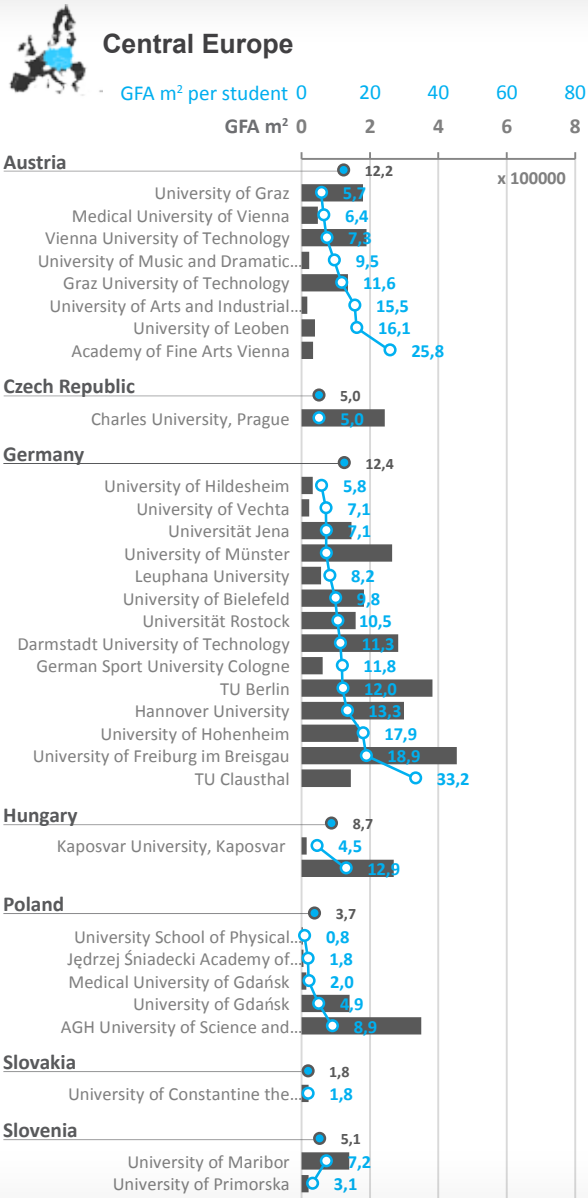
During the research, information availability regarding the total space used by universities varied greatly. As presented in Figure 7, for many countries relevant information was completely registered and accessible, whereas for others, that was possible to a lesser extent. In total, it was possible to retrieve that information for 37% of the analysed universities.

For each university, the retrieved total space was related with its total number of students in order to develop an indicator that would allow further estimations. This indicator expresses the total -currently- used space available for one student of each university. Knowing the overall "spaciousness" of each university would therefore allow for a first round of benchmarking. Furthermore, aggregating these indicators on a national level would facilitate the estimation of the total square meters used by the universities per country, and ultimately in the EU28. Of course the accuracy of the estimation depends on the levels of information availability per country.

Besides that, the value of this indicator is also dependent of the educational focus of the university and whether it provides comprehensive education or it focuses on specific scientific fields. Thus, different facilities would have different space requirements, for example laboratories for research universities or music halls or theatre stages for Art Academies. Still at this level of analysis, universities have not been classified in different profiles, but this could be a suggestion for further research.




British Isles
GFA m² per student 0 20 40 60 80
GFA m² 0 2 4 6 8
x 100000
Ireland
12,3
National University of Ireland,... 9,4
University College Dublin 11,6
National University of Ireland,... 11,6
Dublin City University 12,1
University College Cork 12,7
Trinity College 14,0
University of Limerick 14,8
United Kingdom
14,5
Lowest 10 4,9
Birkbeck College 2,3
The University of West London 4,4
Queen Margaret University,... 4,8
Middlesex University 5,0
Sheffield Hallam University 5,2
Edge Hill University 5,2
University of Bedfordshire
Bath Spa University 5,4
London South Bank University 5,6
The University of Plymouth 5,9
Highest 10 36,2
The Royal Veterinary College 29,4
Guildhall School of Music and Drama 29,6
The University of Edinburgh 30,0
The University of Oxford 32,8
London School of Hygiene.. 34,7
The University of St Andrews 36,0
Writtle College 39,3
Imperial College of Science.. 39,4
The University of Cambridge 44,8
Cranfield University 46,4


Central Europe
GFA m² per student 0 20 40 60 80
GFA m² 0 2 4 6 8
x 100000
Austria
12,2
University of Graz 5,7
Medical University of Vienna 6,4
Vienna University of Technology 7,3
University of Music and Dramatic... 9,5
Graz University of Technology 11,6
University of Arts and Industrial... 15,5
University of Leoben 16,1
Academy of Fine Arts Vienna 25,8
Czech Republic
5,0
Charles University, Prague 5,0
Germany
12,4
University of Hildesheim 5,8
University of Vechta 7,1
Universität Jena 7,1
University of Münster
Leuphana University 8,2
University of Bielefeld 9,8
Universität Rostock 10,5
Darmstadt University of Technology 11,3
German Sport University Cologne 11,8
TU Berlin 12,0
Hannover University 13,3
University of Hohenheim 17,9
University of Freiburg im Breisgau 18,9
TU Clausthal 33,2
Hungary
8,7
Kaposvar University, Kaposvar 4,5
12,9
Poland
3,7
University School of Physical... 0,8
Jędrzej Śniadecki Academy of... 1,8
Medical University of Gdańsk 2,0
University of Gdańsk 4,9
AGH University of Science and... 8,9
Slovakia
1,8
University of Constantine the... 1,8
Slovenia
5,1
University of Maribor 7,2
University of Primorska 3,1

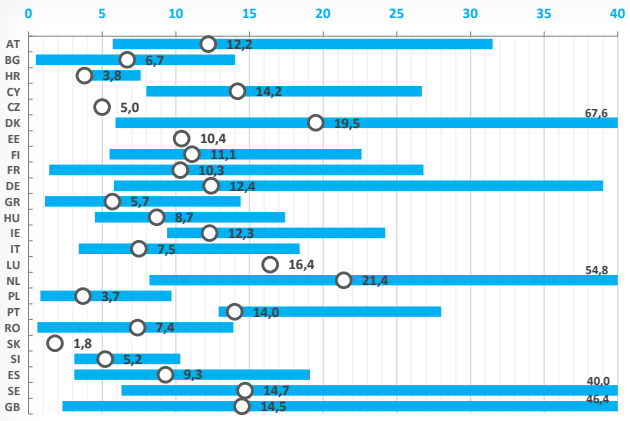
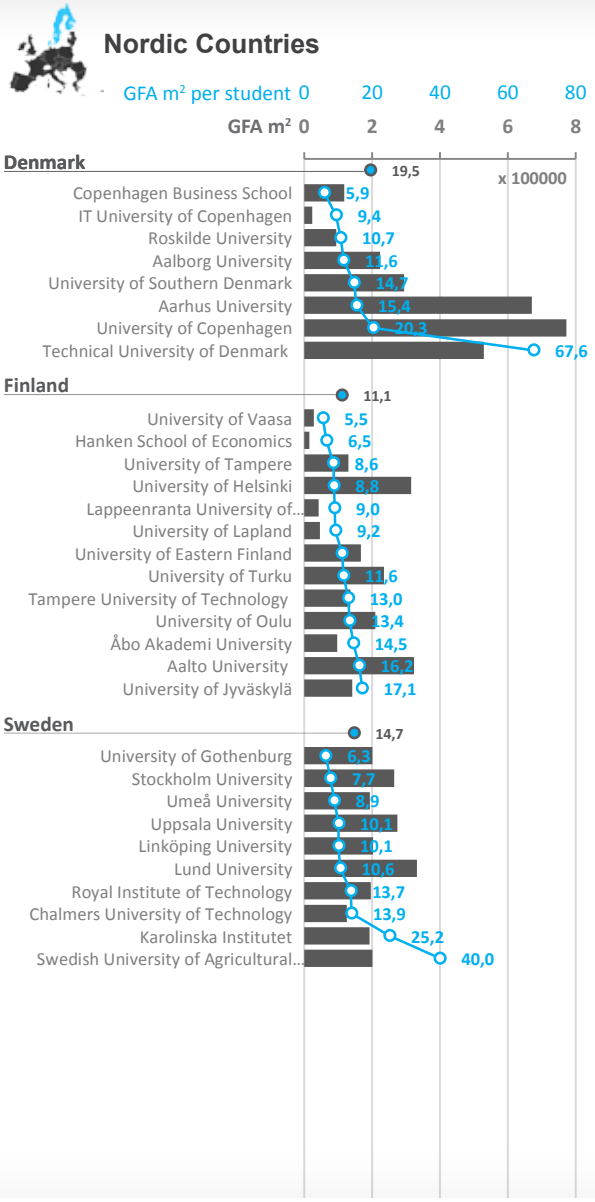


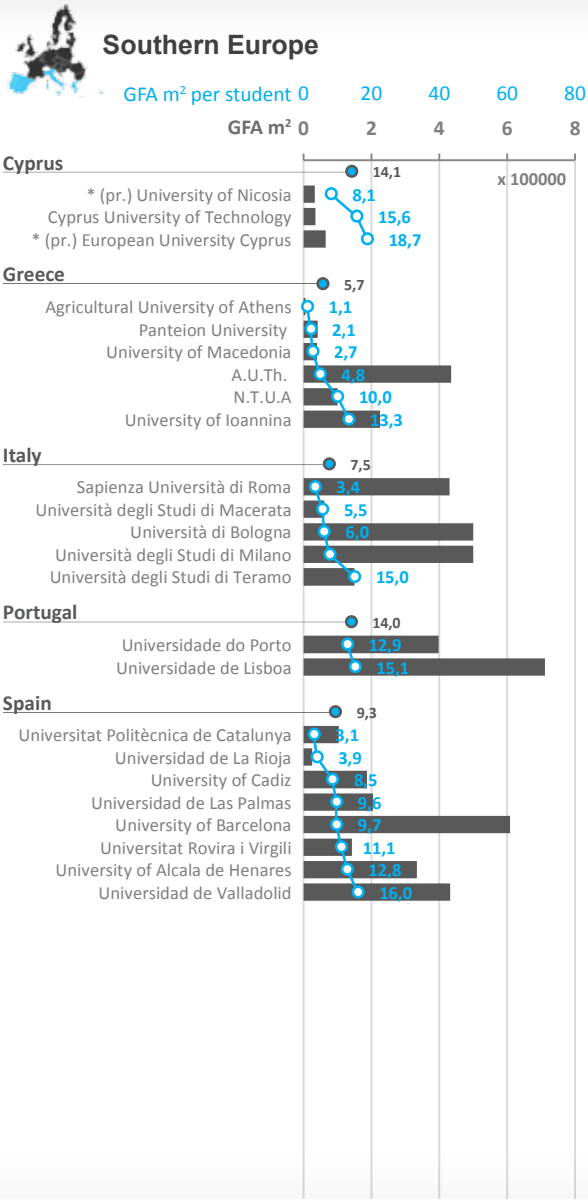
Figure 8.
The range and the average GFA m2 available per one university student, as calculated based on information from 24 EU countries.

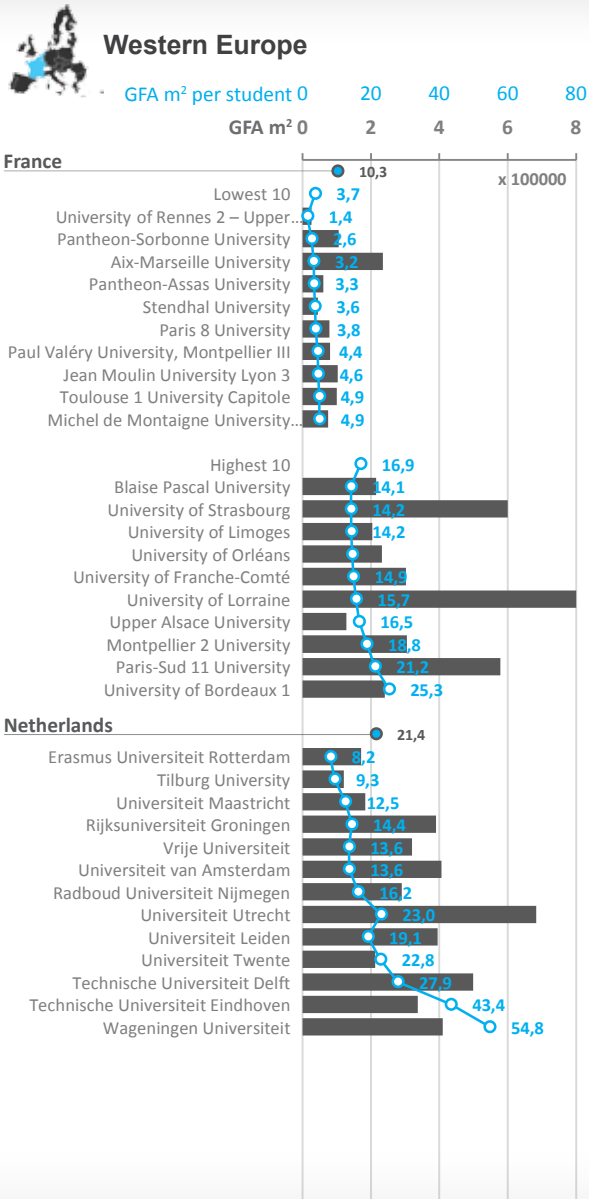
Based on the collected information the highest amount of square meters were used by the University of Lorraine; with more than 800.000 m², it was officially established in 2012 after the merger of 4 institutions. At this point of the research, the exact number of locations or campuses was not registered, thus it is not possible to estimate an average amount of used space in campuses. However, on average each of the universities used around 180.000 m².

After calculating the assignable space per student for the same universities, and developing the national average, it was necessary to assess the level of "spaciousness" in different levels (university, national, European) and thereafter estimate the total amount of used square meters. The minimum national average GFA per student was 1,8 m² from Slovakia and the maximum was 21,4 m² from the Netherlands. Figure 8 shows the range of this indicator for each EU28 member state, based on the available information.

Comparing the European regions, Western Europe (15,4 m²), Nordic Countries (15,1 m²) and the British Isles (12,1 m²) provide the largest GFA m² per student. The analysis showed that 85 of 320 universities offered more than 16 m² per student. An interesting finding of the research is that only one university of Southern Europe managed to match that size, the University of Valladolid. Universities offering more space were all located in Northern or Western Europe. This provides an interesting question for further research, as whether this fact is related to financial capacity or if climate also influences the size of university facilities, in terms of functional requirements.




Southern Europe
GFA m² per student 0 20 40 60 80
GFA m² 0 2 4 6 8
x 100000
Cyprus
14,1
* (pr.) University of Nicosia
8,1
Cyprus University of Technology
15,6
* (pr.) European University Cyprus
18,7
Greece
5,7
Agricultural University of Athens
1,1
Panteion University
2,1
University of Macedonia
2,7
A.U.Th.
4,8
N.T.U.A
10,0
University of Ioannina
Italy
7,5
Sapienza Università di Roma
Università degli Studi di Macerata
5,5
Università di Bologna
Università degli Studi di Milano
Università degli Studi di Teramo
15,0
Portugal
14,0
Universidade do Porto
12,9
Universidade de Lisboa
15,1
Spain
9,3
Universitat Politècnica de Catalunya
Universidad de La Rioja
3,9
University of Cadiz
Universidad de Las Palmas
9,6
University of Barcelona
9,7
Universitat Rovira i Virgili
11,1
University of Alcala de Henares
12,8
Universidad de Valladolid
16,0


Western Europe
GFA m² per student 0 20 40 60 80
GFA m² 0 2 4 6 8
x 100000
France
10,3
Lowest 10
3,7
University of Rennes 2 – Upper...
1,4
Pantheon-Sorbonne University
Aix-Marseille University
3,2
Pantheon-Assas University
3,3
Stendhal University
3,6
Paris 8 University
3,8
Paul Valéry University, Montpellier III
4,4
Jean Moulin University Lyon 3
4,6
Toulouse 1 University Capitole
4,9
Michel de Montaigne University...
4,9
Highest 10
16,9
Blaise Pascal University
14,1
University of Strasbourg
14,2
University of Limoges
14,2
University of Orléans
University of Franche-Comté
14,9
University of Lorraine
15,7
Upper Alsace University
16,5
Montpellier 2 University
18,8
Paris-Sud 11 University
21,2
University of Bordeaux 1
25,3
Netherlands
21,4
Erasmus Universiteit Rotterdam
8,2
Tilburg University
9,3
Universiteit Maastricht
12,5
Rijksuniversiteit Groningen
14,4
Vrije Universiteit
13,6
Universiteit van Amsterdam
13,6
Radboud Universiteit Nijmegen
16,2
Universiteit Utrecht
23,0
Universiteit Leiden
19,1
Universiteit Twente
22,8
Technische Universiteit Delft
27,9
Technische Universiteit Eindhoven
43,4
Wageningen Universiteit
54,8


Madrid region, Alcalá de Henares, University of Alcalá


Glasgow, University of Glasgow

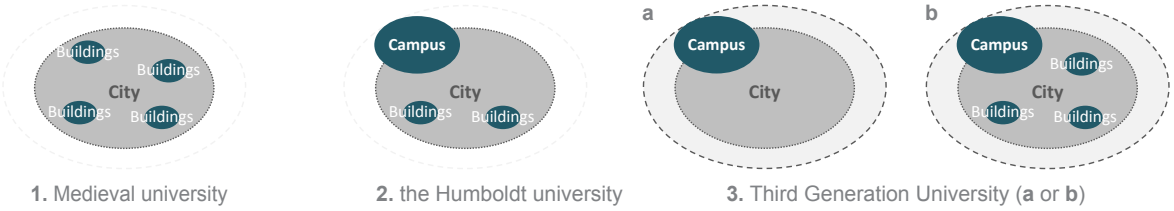
In many publications on the history of the university (Pedersen 1998; Ruegg 2004; Wissema 2005 in Den Heijer, 2011) three important periods are distinguished: (1) the Medieval university, (2) the Humboldt university and (3) the 'Third generation university'. These periods are mainly important because of the major changes in the context, the impact on the primary processes of education and research, and – consequently – on the campus in terms of both land and buildings. The physical presence of the university had therefore evolved through these periods.

The Medieval university was first accommodated in monasteries and buildings for education inside the European medieval cities. Providing education and a place of interaction for the elite, these universities projected the associated status in the buildings they used. During the Renaissance and because of the increased accessibility to knowledge, more universities established, setting up the basis of the current European university network.

The Humboldt university originates to the Renaissance period and is related with the establishment of the Humboldt Universität Berlin (1810). In this period focus shifts to mono-disciplinary research. The model flourishes in the Age of Reason and was viable until 1960, when new developments imposed its evolution, primarily because of the explosive increase in student enrolment of that decade. Faculties grew rapidly and research facilities were both space-demanding and they required locations isolated from housing and other urban functions, thus the university moved toward the periphery of cities. Today, that typology characterises many European campuses, but is also under pressure by aspects that influence if not define, what should be called the third generation university.

The current third generation university (3GU) – a network university – is increasingly valorisation oriented, focussing on knowledge transfer, also to explore alternative funding options. This 3GU has English as lingua franca enhancing and stimulating international mobility, and is also characterised by the wide use of ICT for its processes (Van der Zanden, 2009).

The establishment of universities is associated with certain space demand , which in most of the cases wes met with the development of their campus. Based on this assumption, a relation of the age of universities to the condition of their campuses will be attempted. First it would be relevant to assess the life-span of each European university sector. Doing so will increase the insight on the expected campus models for each sector.



1. Medieval university **2.** the Humboldt university **3.** Third Generation University (**a** or **b**)

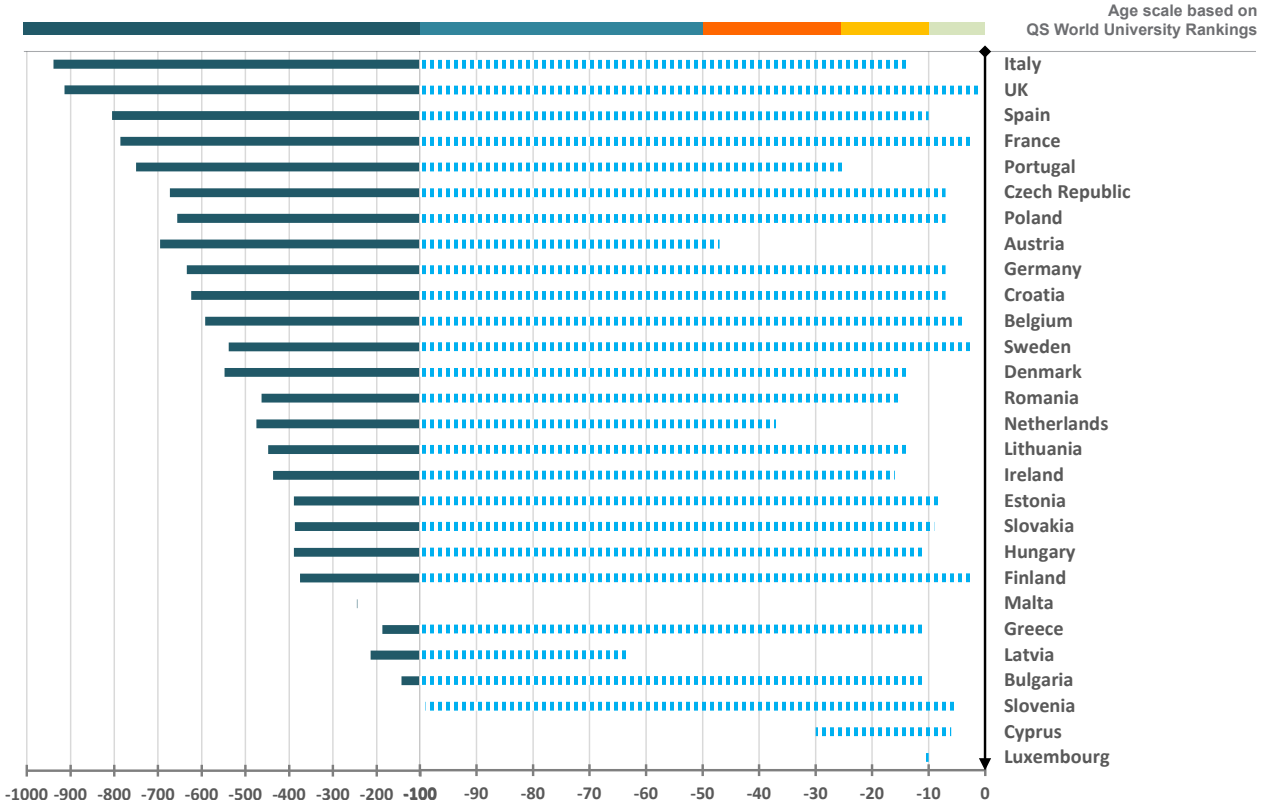


Figure 9.
The time-line of the university sector, and the evolution of the university's physical presence in the city.

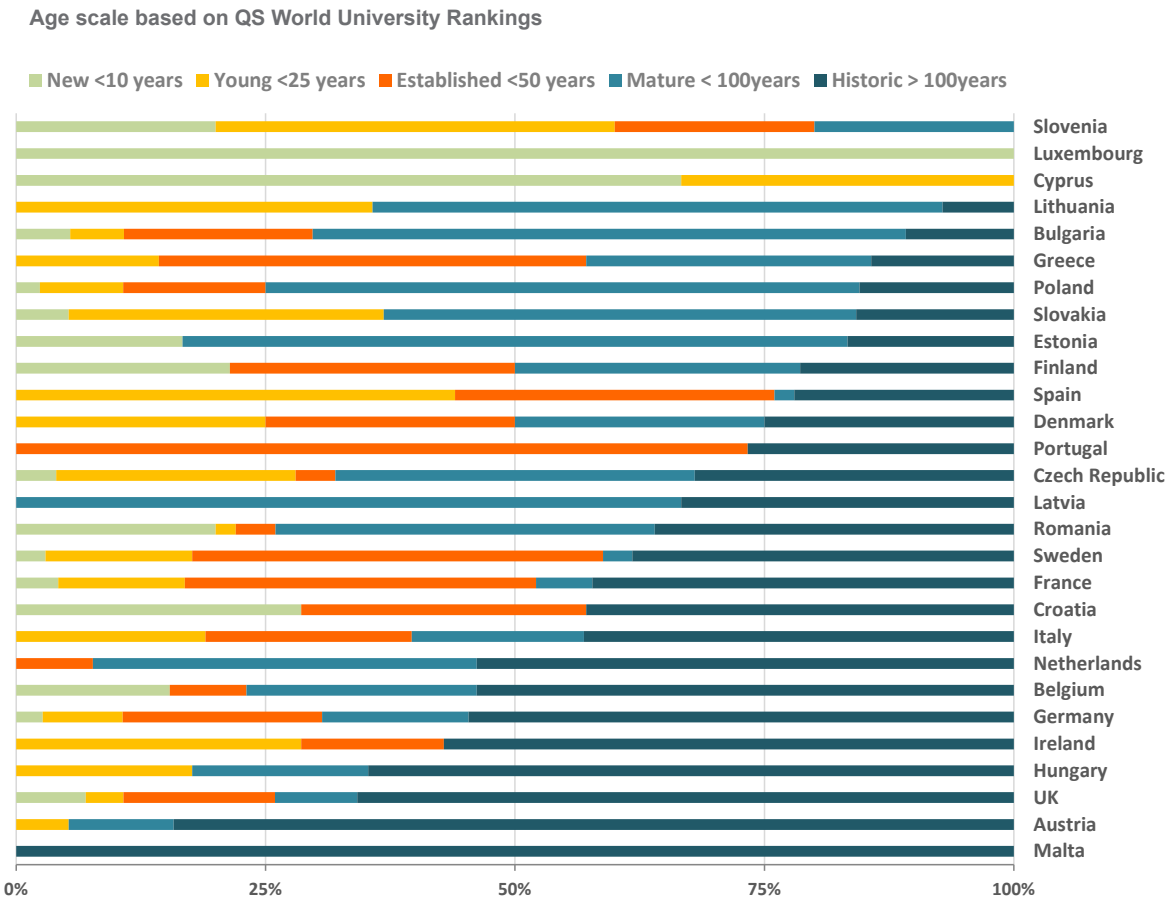


Figure 10.
The age structure of the European universities.

A next step would be to categorise and thereafter assess the age structure of each university sector. This would provide a rough indication of the sectors' age composition. For this purpose, an age scale was adopted from QS World Universities rankings (IU.QS.com, 2013). Its first three categories (New, Young and Established) may be related to a 50 years life-cycle of real estate, thus indicate an expected condition of the campus, in a worse-case scenario. For Mature and Historic universities the assumption is that they would be faced with the same challenges, but it would be more probable to also use or own historic buildings. The two figures to the left, provide the reader with an overview of the EU28 university sector. In Figure 9, every member state is sorted out based on its oldest university, and Figure 10 shows the age structure of the university sectore per each member state.

During the research, it was possible to identify four examples related to the condition of the universities' campuses. A grade from A to E was used, indicating an life-span of 10 years per grade. The first example concerns the French universities. In this case, the condition of real estate is not related to time or age, but rather to a ratio which expresses the cost of refurbishment weighted against the replacement cost. The time factor may be assumed again, if we consider a 50 years life-cycle for real estate, and set the aforementioned ratio to 100%. For French universities, only a third of the total square meters were in good condition in 2008, as already mentioned in the country's profile.

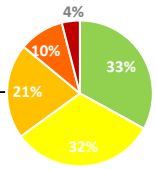
The next two examples concern the Dutch and British universities. The majority (90%) of the Dutch universities' real estate is 50 years old or younger, with only 14% of the total younger than 10 years though. Moreover, there is 6% which is between 50 to 100 years old and 4% which is older than a century. At the same time, two thirds of the British university real estate was built in the last 54 years, of which 42% between 1960 and 1970. On the other hand, 25% of the total are buildings older than 100 years, 4% of which were built before 1840.

The final example is from Romania, and concerns a Mature university (69 years old). This examples supports the above-mentioned assumptions, as it shows that the current real estate is of two different eras, probably meeting the relevant space demand of each. Thus, two thirds of it is 40 years old, and one third is recently built. This example could be used to highlight the fact of ageing facilities for a big portion of European universities, and the relevant decisions about ways to upgrade and modernise them.

France
French Universities

Condition of universities total GFA expressed as the Refurbishment cost as a % of replacement cost

Refurbishment / Replacement	Grade	GFA %
0% to 20%	A	33%
20% to 40%	B	32%
40% to 60%	C	21%
60% to 80%	D	10%
80% to 100%	E	4%

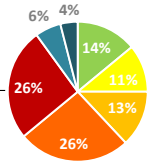


Netherlands
Dutch Universities

Average age of the universities' facilities

Age*	Grade	GFA %
0 to 10 years	A	14%
10 to 20 years	B	11%
20 to 30 years	C	13%
30 to 40 years	D	26%
40 to 50 years	E	26%
50 to 100 years		6%
100 years or more		4%

** as per 2010*

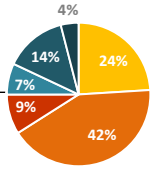


United Kingdom
British Universities

Non-residential university real estate built by era

Era	Age*	GFA %
Built since 1980	34	24%
Built 1960 to 1979	54	42%
Built 1940 to 1959	74	9%
Built 1914 to 1939	100	7%
Built 1840 to 1914	174	14%
Built before 1840	175+	4%

** as per 2014*



Romania
Banat's University of Agricultural Sciences and Veterinary Medicine of Timisoara (est. 1945)

Age of the university facilities

Age	Grade	GFA %
0 to 10 years	A	38%
10 to 20 years	B	0%
20 to 30 years	C	0%
30 to 40 years	D	62%
40 to 50 years	E	0%

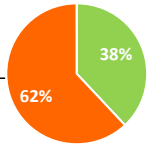
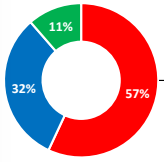


Figure 11.
Space types on campus and the required university function mix for the future university (Den Heijer, 2011).

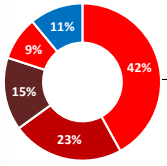
Functions:
- Academic (Red)
- Business (Orange)
- Residential (Blue)
- Retail & Leisure (Green)
- Infrastructure (Black)



Czech Republic
Charches University of Prague

Number of Buildings per functional type

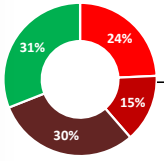
Function	Type	Buildings
Education, Research & Administration	**A**	**90**
Canteen & Student Housing	**H**	**50**
Sport Facilities	**L**	**18**



France
French Universities

Total Space per Function

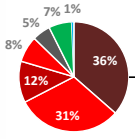
Function	Type	GFA m2
Education	**A**	7.839.256
Research	**A**	4.292.926
Administration	**A**	2.799.734
Library & Documentation	**A**	1.679.841
Housting, Food, Culture, Sports	**H & L**	2.053.138



Greece
Aristotle University of Thessaloniki

Space per Function, at the university Campus

Function	Type	GFA m2
Education	**A**	58.530
Research	**A**	34.718
Offices	**A**	73.304
Other Functions	**L & B**	74.765



Functional breakdown (%) per Faculty Building

Function	Type	GFA %
Offices	**A**	36%
Education	**A**	31%
Research	**A**	12%
Libraries	**A**	8%
Support Spaces	**I**	5%
Other Functions	**L**	7%
Student Club	**H & L**	1%

The university campus as a physical setting is expected to host a variety of functions besides these required for its core process, thus education and research. The model of the functional mix of a university campus, which is presented at Figure 11, has been specified and developed earlier by Den Heijer (Den Heijer, 2011). Besides academic functions (red), a campus may accommodate related business functions (orange), in other words space for partners linked to academic goals & supporting processes. Hence the left set of functions to the – academic and related business- primarily enhances the goals and processes of the university as an organisation.

On the other hand, the university campus may also host functions related to the personal development and needs of its users, like its students and its employees or even various external users, such as temporary visitors from the city or tourists. These functions are presented at the right side of the graph. The first one, the residential function (blue) is related with the accommodation of these users and it could be student and staff housing or even hotels and other places of temporary accommodation. The second one, retail and leisure (green), is related with users' experiences at the university campus, and is about amenities mainly focused at providing catering and supporting sports and cultural activities.

Finally, what binds and enhances the overall performance of both sets of functions is infrastructure, which could range from the accessibility of the campus to available parking. Depending on the campus location in relation to the city, the abovementioned functional mix may be covered beyond the boundaries of the university, at least to a certain extend. Nonetheless the urban function-mix can complement the supply on campus, and vice versa (Den Heijer, 2011).

During the research it was possible to retrieve information about the functional mix of seven examples. Three of them provide insight into the functional mix of certain universities and four of them describe the functional mix at a national level. The first example is from the Czech Republic, Charles University. Out of 158 buildings used by the university, 57% of them is dedicated to academic purposes, 32% to student housing and 11% to sport facilities. The actual functional mix ration might be different, considering that it is not calculated based on the surface of the buildings. Still is is an indication of its real estate portfolio functional composition.

The second example concerns the functional mix of the French universities. The vast majority of their surface (89%)

is dedicated to academic purposes, while only 11% is dedicated to residential or retail and leisure. French universities are primarily focused on education and research, with 65% of their total surface dedicated to these functions. Finally, office space for administration is only 15% of the total surface, however office space for the academic staff might be included in the education portion.

The third example is from Greece, Aristotle University of Thessaloniki. Again, academic surface is 69% of the campus facilities, which are primarily dedicated to education (24%) rather than to research (15%). On the other hand, office space is 30%, a ratio doubled compared to the French universities. Looking at the university's average functional mix per faculty building, and comparing it with the space portion dedicated to non-academic functions at campus level (8% versus 31%), it becomes obvious that non-academic functions are primarily provided in dedicated shared facilities, such as its sports centre and the centralised stundent club, a big catering facility.

The fourth example concerns the functional mix of the Dutch universities. Dutch universities provide more space for research than for education (21% versus 16%). Still the total space dedicated to academic purposes is 70% of the total surface. This fact further supports the emergence of a pattern suggesting that around two thirds of the university surface is dedicated to academic-related functions.

The fifth example is from Slovakia, the University of Constantine the Philosopher, which shows a rather low functional mix, besides academic functions (96%). Again, the majority of space is dedicated to education and offices (77%) and only 15% to research.

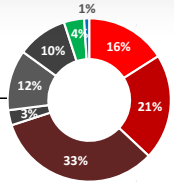
The sixth example concerns the functional mix of the Spanish universities. Again, two thirds of the total space is dedicated to academic-related functions and15% to research-related functions. Sport facilities are 10% and student housing is only 3% of the total surface. Almost one quarter of the Spanish universities' facilities are support spaces.

Finally, the last example from the United Kingdom shows the ratio of the residential surface -student housing- (23%) compared to the total. This is an important indicator, as it derives from a sector that centrally monitores its real estate portfolio (AUDE, HESA) thus it provides insight on the required student accommodation, at least following a certain overall campus strategy.

Netherlands
Dutch Universities

Functional breakdown (%) at Campus level

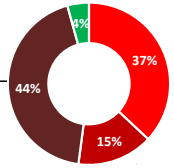
Function	Type	GFA %
Education	A	16%
Specific space, inc. laboratories	A	21%
Office	A	33%
Sanitary	I	3%
Storage	I	12%
Support	I	10%
Restaurant	L	4%
Residential	H	1%



Slovakia
University of Constantine the Philosopher

Space per Function

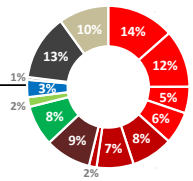
Function	Type	GFA m2
Education	A	7.558
Laboratories	A	3.090
Offices	A	8.915
Sport facilities	L	878



Spain
Spanish Universities

Total Space per Function

Function	Type	GFA m2
Aulas	A	1.722.905
Delivery and PDI seminars	A	1.467.140
Other venues	A	673.739
Library, newspaper and archives	A	820.633
Laboratories	A	1.060.444
Research	A	941.896
Computer rooms	A	193.847
Management and administration	A	1.169.312
Sports facilities	L	1.031.734
Cultural facilities	L	246.289
Dormitories and residences	H	439.756
IT Services	I	69.556
Parking	I	1.670.159
Other services	B & I	1.272.819



United Kingdom
British Universities

		GFA m2
Non-Residential	A	20.354.195
Residential	H	6.217.820

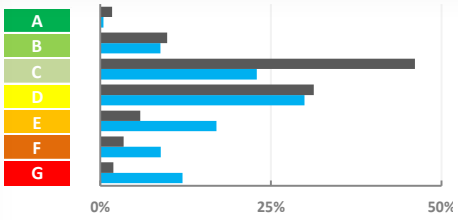


Figure 12.
British university real estate energy performance categorised inDEC labels, for both Non-Residential (grey) and Residential (cyan) m².

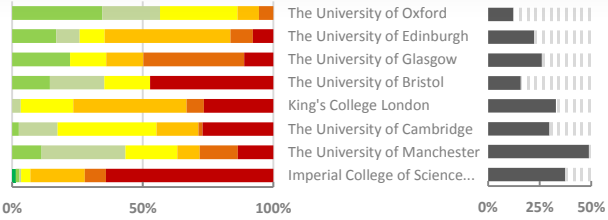
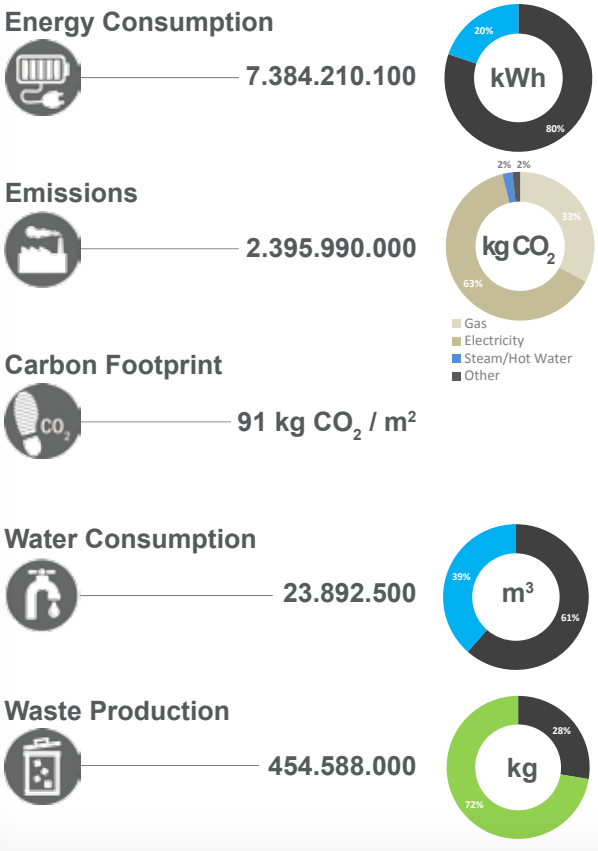


Figure 13.
Energy performance of Non-Residential m² of eight highly ranked British universities,and percentage of registered m² (grey) to DEC labeling system.



The British University sector provided a complete overview of the universities' real estate (HESA, 2013), therefore it will be used as a reference point regarding the environmental sustainability of the university facilities. In the United Kingdom a DEC shows the energy performance of a building based on actual energy consumption. It has been decided that the common unit should be CO_2 emissions, since this is a key driver for energy policy. The rating is shown on a scale from A to G, where A is the lowest CO_2 emissions (best) and G is the highest CO_2 emissions (worst) (DCLG, 2012).

For residential university real estate, 58% is rated between A to C, 31% has label D and only 11% is between E to G. For non-residential (academic functions) university real estate, 32% is rated between A to C, 30% has label D and 38% is between E to G (HESA, 2013). Analysing the real estate of eight British universities ranked in the top-100 of the world, 27% is rated between A to C, 19% has label D and the remaining half, 54% is between E to G. However, only 44% of their real estate is registered in DEC categories (HESA, 2013).

For the academic year 2011/12, the total energy consumption of the British universities was 7,5 billion kWh of electricity annually, of which non-residential real estate consumed 80%. The total CO_2 emissions were 2,4 million tonnes, resulting in a carbon footprint of 91 kg of CO_2 per square meter (gross floor area). The total water consumption of the British Universities was almost 24 million m3, of which non-residential real estate consumed 62%. Finally, British universities produced 454.588 tonnes of waste, with 72% of it recycled (HESA, 2013).

AUDE mentions that in the past years, total property costs remained stable, even if energy prices were increased. This is partly related to works that upgraded the energy efficiency of many of the university facilities (AUDE, 2013).

The hierarchy of needs was first introduced to Dutch campus managers in 2002 as a communication tool about quality of space. Instead of using terms like 'basic' or 'luxurious' that are ill-defined, the quality levels are linked to psychological needs of individuals. After all, the degree of satisfaction is largely determined by the extent to which the environment fulfils general and individual needs. For this purpose the need-satisfaction theory of the American psychologist Abraham Maslow (1954) was transformed to user needs by Blyth and Worthington (2001). This classification of user needs turned out to be a useful communication tool about (expected) quality levels of the built environment. This tool was edited and applied in Den Heijer's campus research at Dutch universities from 2002.

See figure (pyramid) - the cumulative quality levels relate to physiological needs, safety needs, needs for love & belongingness, needs for esteem and needs for self-actualisation. These needs can be linked to cumulative building requirements: a healthy, safe, social, attractive and inspiring learning and working environment. Next to expressing user demand on campus, these cumulative quality levels can also be used to express the quality levels of the existing campus. In 2007 a slightly adapted model was presented to campus managers of Dutch universities. They were asked what part of their current campus in gross floor area (2007) roughly is 'plain & efficient', a 'social meeting place' and 'inspiring & representative'.

The quality 'plain & inefficient' was added for the current campus, referring to buildings that do not meet legal standards for health and safety guidelines, formulated in the Dutch Occupational Health and Safety Act ('Arbowet'). A building that does meet these guidelines is minimally 'plain & efficient'. Adding qualities to meet social needs of users makes the building a 'social meeting place'. Finally, adding qualities that make the building attractive and inspiring to both internal users and external parties, labels a building as 'inspiring and attractive': it can become a showcase for the university. The same cumulative qualities can also be projected on space within a building.

During the research it was possible to identify such strategic priorities regarding the quality of the universities' space, at least for some of the Countries. One example linked to first level of the pyramid model, "plain and efficient" comes from France. In 2007, a quarter of the universities facilities were below fire safety standards, and 15% of the facilities was unsuitable for teaching and research, thus they did not meet that first basic level. The response to this problem was increased public investment for HE

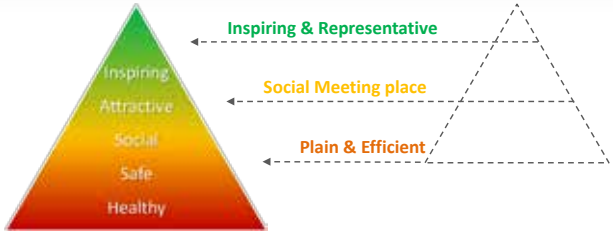


Figure 14.
Quality ambitions aligned with Maslow's hierarchy of needs.

and the university facilities, highlighted by the project Operation Campus, which aimed at developing selected "flagship" world-class universities. Therefore increasing the quality levels to "inspiring & representative",

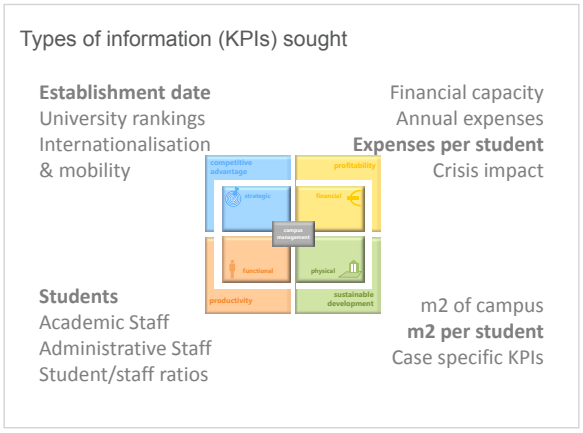
A similar example with lower quality ambitions, comes from Latvia. There thirty one infrastructure projects aiming at the modernisation of obsolete university facilities, upgrading them to new standards -such as improved accessibility for people with disabilities. Funded by European Structural Funds, these projects will provide the first level of quality, "plain & efficient", at a cost of €142 min.

The next level of the pyramid, "social meeting place", can be related mostly with the strategies of the Danish universities. With growing demand for space, the goal is to provide enough space in attractive universities that offer a good setting for academic and social exchange. Therefore for Danish universities "plain & efficient" is the starting point, and the main objective, "social meeting place" tends to be blended with "inspiring & representative", mostly addressing the inspiring qualities of space.

Closing with two last examples from Austria, one from TU Wien, through the project "TU University 2015" and one from the Vienna University of Economics and Business. The goals of the first university is to create optimal basic conditions for the students and staff, improving aspects such as accessibility and sustainability of buildings, and also, promote the corporate identity of the university. Thus the quality ambitions are clearly framed by "plain & efficient" and "inspiring & representative". Finally, in the new campus of the Vienna University of Economics and Business, the buildings from world-known architects, are used also for their symbolic value, being "representative" of the university's identity.

Groningen, Academiegebouw University of Groningen

Vision on the European campus



After comparing information of 28 EU member states and drawing more detailed conclusions from that cross-case analysis, this section will summarize more general notions and our vision on both the challenges and possible solutions for the European campus.

This vision is also based on evidence and information from prior research and from visits to European universities and their campuses in the past three years, since the dissertation "Managing the university campus" was published in 2011. An overview of these visits to and from European universities can be found in the list of references in this book.

We will elaborate upon the propositions that were introduced in part A of this book:

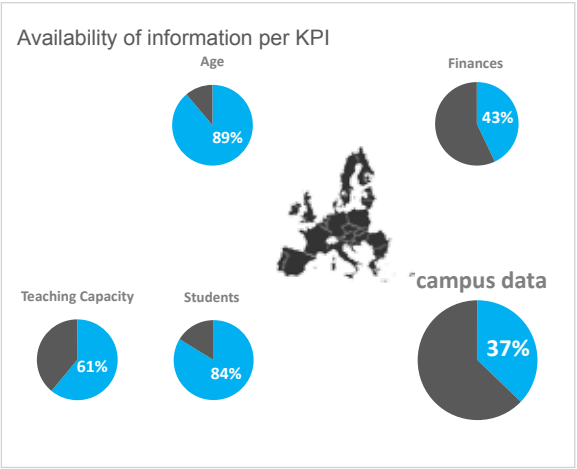
Proposition 1
The European campus is an asset for Europe's knowledge economy: an 'enabler' for Europe 2020.

Proposition 2
The European campus is a (potential) problem for Europe's knowledge economy: a 'disabler' for Europe 2020.

But first we will reflect on the process of gathering the data. The goal of this research was to find more evidence for both propositions. Our research method to browse 869 university websites for (campus) data – and the comparison with more aggregated sources – generated more information than we expected, certainly about our main focus: campus data.

Campus data was available for 37% of the assessed 869 universities

Of all the key performance indicators we collected, the establishing date was available for 89% of all universities, data about students and teaching capacity for 84% and 61%, financial data for 43% and campus data – square meters in total – for 37%.

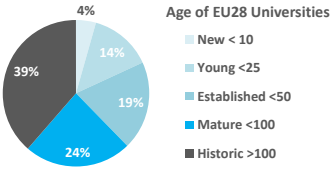


869 European universities accommodate 13,6 million students plus research activities on 136 million m²: an average of 10 m² per student.

In the next sections evidence is summarized to elaborate upon both the disabler function of the campus (problem statement / challenges) and the enabler function of the campus (heritage / univer-city model / shared functions). It could be read as a diagnosis of the problem and guidelines for (managing) the European campus.

The assessed 869 universities are research universities with third degree education (PhD degree); they represent 67% of students in European higher education.

35 Universities in the top-100



1 min
non-EU students

more than **850 universities**
require **€80bn to €130bn** per year

the average **expenditure** for one student is
€ 8.200

17

per Academic

20 min
in HE

13,6 min

in Universities

more than **850 universities**
are expected to use
136min m² GFA
with **10m²** per student on average

In the next sections evidence is summarized to elaborate upon both the disabler function of the campus (problem statement / challenges) and the enabler function of the campus (heritage / univer-city model / shared functions). It could be read as a diagnosis of the problem and guidelines for (managing) the European campus.

Problem statement – the aging European campus as a disabler for Europe's knowledge economy.

One of the starting points of this research about the European campus is the problem of dysfunctional, energy-inefficient and ageing buildings. As a research team we want to investigate the scale of this problem (in m^2) and estimate how many (financial) resources are required to improve the quality of the campus, in terms of functionality, technical condition and energy-efficiency.

More than half of the floor area at European campuses is 50 years or older.

The campus data of part B shows that more than half of the European campus is older than 50 years. We can assume that the majority of these buildings needs reinvestment to improve the functionality, technical condition and energy-efficiency. Based on age profiles and (technical) condition data of some EU member states, the percentage probably ranges from 30% to 50% of the total floor area at European universities. This equals 40 to 70 million m^2 gross floor area (GFA).

Between 30% to 50% of the floor area (m^2) at European campuses will require reinvestment; this equals 40 to 70 million m^2.

Changing demand will even add to the number of m^2 that needs to be transformed or built on European campuses, either because new functions are required (new laboratories for new research) or because students and staff members require different types of workplaces or have become more critical about the quality of their learning and working environment.

Using project references to calculate the costs of upgrading m².

For estimating the current replacement costs (in euros per m²). European universities can use each other's project references as benchmarks – to make an educated guess of investment costs and operating costs. Universities in some European countries have – in some form – collected project data to build a database of references (UK, Sweden, Germany, Netherlands).

The Dutch database that has been built in the past decade, in close collaboration with all Dutch universities (Den Heijer 2011, Den Heijer et al. 2013), contains 60 recent projects and contains financial (euro/m2), functional (users/m²), physical (energy use) and strategic (project goals) data – aligning with the conceptual framework for campus management that was introduced in part A.

Investment levels in this database range from 500 euros/m² to 4100 euros/m² – this range can be explained with information about project type, size and quality. To determine quality levels Maslov's pyramid was applied - see Figure 14. Roughly, the investment level to reach "plain & efficient" ranges from 500 to 1500 euros/m² GFA, to reach "social meeting place" from 1300 to 2600 euros/m² and to read "inspiring & representative" 2000 to 4200 euros/m².

For functions like laboratories or small buildings this range starts at a much higher price level. But for listed, historic buildings the price level for "social meeting place" and "inspiring & representative" starts lower, because of the existing qualities of the building. This is a valuable notion for the European campus that has a relatively high percentage of buildings that are more than a century old.

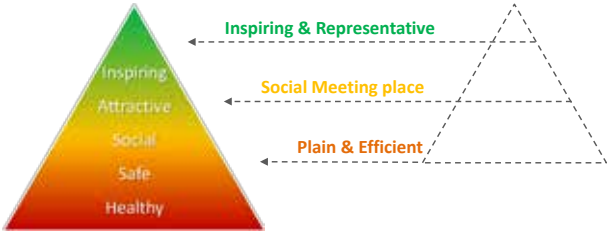


Figure 14.
Quality ambitions aligned with Maslow's hierarchy of needs.

Based on the Dutch project database the investment level to upgrade the European campus to "plain & efficient" is at least 1000 euros per m² gross floor area (GFA). So, the reinvestment plan to improve roughly 40 to 70 million m² European campus would cost at least 40 to 70 billion euros.

Upgrading dysfunctional buildings to the minimum levels of health and safety would require 40 to 70 billion euros – adding more qualities would at least double that amount.

What should be taken into account is that reinvestment could lead to lower maintenance costs, lower energy use and presumably higher productivity of users per m² (or no preventing productivity loss) and more satisfied users (or less dissatisfied users).

With energy-efficiency being a priority at many universities the focus of refurbishment will be on resource-efficiency, which can be interpreted as energy-efficiency and encourage sustainable innovations. Still, many resources are required to upgrade existing m² to new standards and limited (and decreasing) budget at many European universities imply that universities cannot fund the necessary investments to upgrade their buildings.

Most universities cannot afford to upgrade their aging buildings to current standards for functionality and resource-efficiency

At the same time, demand is changing – some universities are coping with decreasing student numbers – also due to an aging population – and most universities are dealing with a population that not only expects a healthy, safe and comfortable workplace, but also a social, attractive and inspiring learning and working environment.

Quality of space requires higher investment levels per m² – at least more than 2000 euro per m². However, not every m² on campus needs to be inspiring: a small percentage as 'the front office of the campus' can be enough.

Aligning with changing demand, most campus managers (Den Heijer 2011) are adding effectiveness goals to the efficiency goals for their campus – see list and their priorities.

In Dutch campus strategies the five campus goals with the highest scores were (Den Heijer 2011):

1. support user goals more effectively (follow changes in education/research);
2. support identity university / attract (more) students & staff members;
3. achieve or maintain minimum quality for use permit ("safe and healthy workplace");
4. accommodating growth (students, research institutes etc.);
5. increase occupancy and frequency rates.

One of the most interesting goals above is number 5 on the list: "increase occupancy and frequency rates" – improving space utilization and optimal use of the capacity of meeting rooms, lecture halls, etc.

Inefficient use of space is one of the largest problems on campus

In some European countries space utilization is measured systematically – for instance in the UK and Sweden. In most countries post-occupancy evaluations on project level show very low percentages of actual use, compared to the opening hours and to the maximum capacity. Percentages of scheduled use are often hiding the problem that spaces are often booked, but not used (or just used during a limited time slot of the scheduled time).

The fact that there is rarely an incentive to cancel bookings for education, events and meetings leads to the paradox – "fully booked, but hardly used": facilities are scheduled efficiently, but still appear underused in reality.

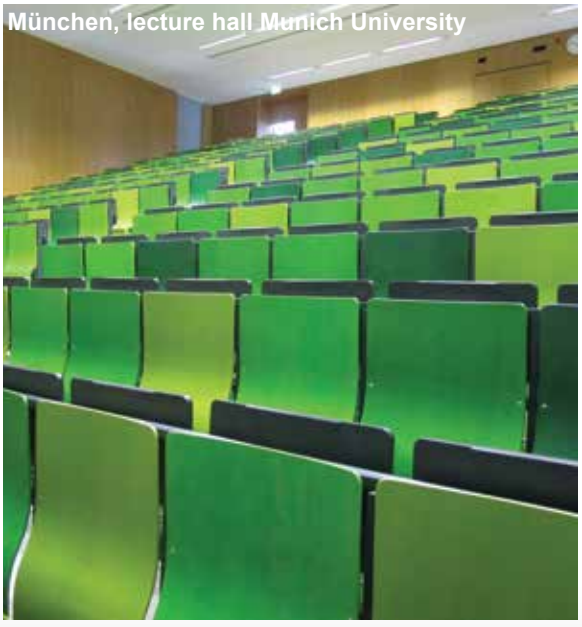
Scheduled use differs from reality: "fully booked, but hardly used", a paradox on many campuses

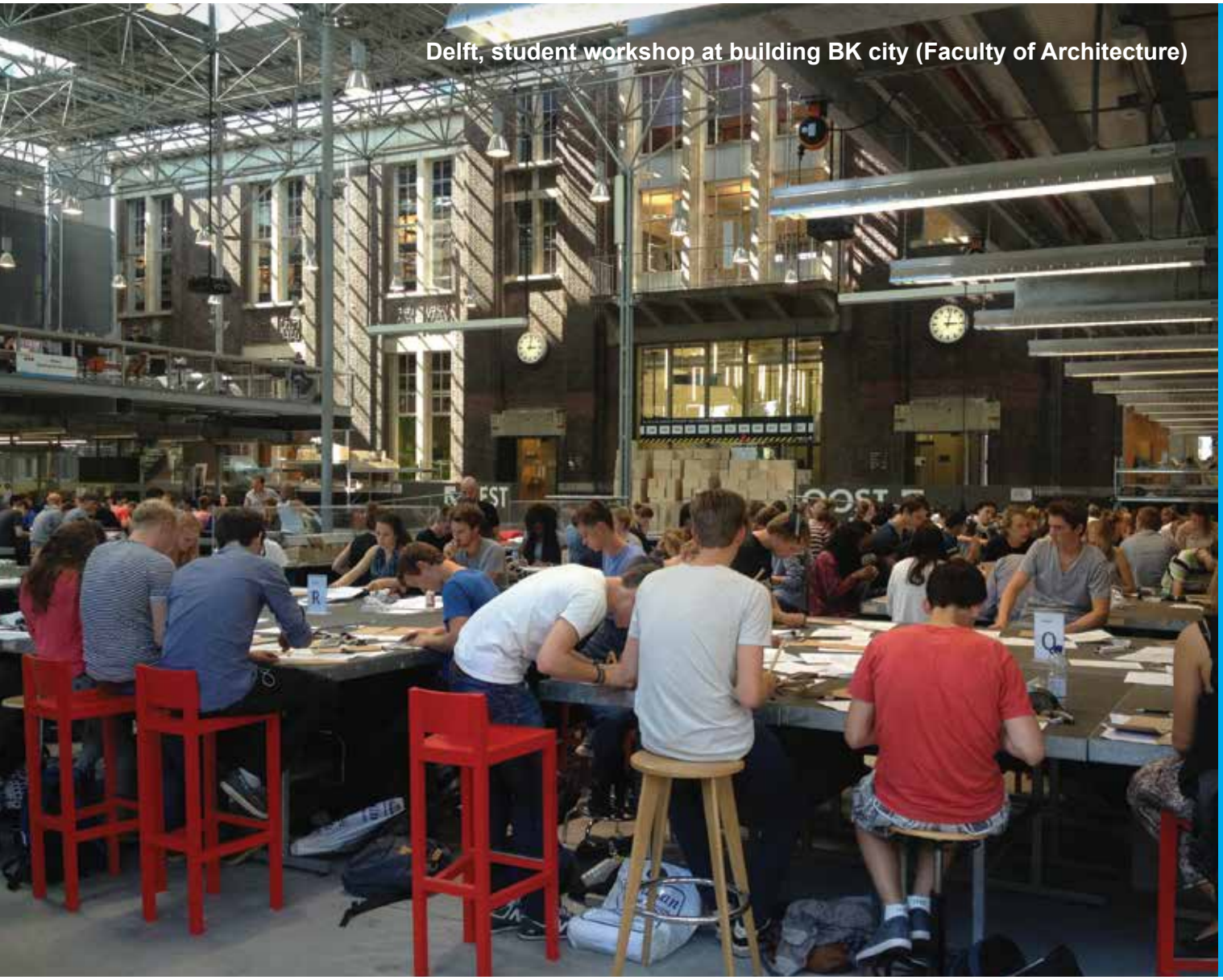
Effectively, low space utilization implies low benefits per m^2. Combining that with the conclusions about increasingly higher investment levels and operating costs per m^2 on campus, the costs per m^2 are likely to be higher than the benefits. This calls for strategies that reduce the footprint per user before investing in quality improvement.

An increasing amount of activities at universities can take place anywhere; many students en staff members work at home for at least one day a week. At most universities this requires a culture change. Low occupancy and frequency rates are often caused by a territorial culture: from large individual workplaces to lecture halls that are used by one specific school, from restaurants and libraries per building to laboratories for single research groups.

To some extent, territory serves a purpose: it adds to the sense of belonging, but it has a price. The same resources that are spent on the campus can also be allocated directly to education and research, or to quality instead of quantity of space.

On top of the efficiency reasons to want to reduce the footprint, there are many reasons to believe increasing the 'density of people' (per m^2) also has positive effects on the university goals: it adds to community and to proximity, which enables serendipity and cross-disciplinary innovation (Bentinck, Curvelo Magdaniel 2012). Accordingly, very low space utilization rates can have a negative effect on both serendipity and innovation.


München, lecture hall Munich University



Delft, student workshop at building BK city (Faculty of Architecture)

A territorial culture has large impact on the costs of the campus

So, effectively the previous statements add up to the following question: why upgrade buildings or add new buildings, when improving space utilization could also solve (part of) the problem?

In the past decades, building new or adding space usually led to moving to cheaper locations outside the (inner) city, which is apparent when assessing campuses and their spatial relation to the city (Hoeger and Christiaanse 2007, Curvelo Magdaniel 2012). The assessment of costs per m^2 exceeding the benefits per m^2 in many cases led to selling heritage buildings, while heritage buildings are considered important to highlight the history of the university, to attract new students and staff and to satisfy the university community (Dober 2005, Chapman 2006, Worthington 2007, Perry et al. 2009).

At the same time, both city and university have acknowledged their mutually beneficial relationship, socio-economically, socio-culturally and demographically. More recently, with the increased (global) mobility of students, universities have noticed that quality of life has an almost equal weight as academic quality (and rankings), when choosing a place to study (Study Portals 2012) – see figure. Creating a campus without 'sense of place' or relation to its hosting city might have a negative effect on the competitive advantage of the university.

Why study abroad?
Reasons (not) to go

reasons to go		reasons not to go	
1. academic reputation - professors, programme, teaching method, rankings	25%	1. academic reputation - English language skills of staff, workload	58%
2. country / city / culture	24%	2. city / culture - lack of integration	18%
3. career development - employability, learning the language, personal/intercultural relations	18%	3. social life - lack of organised events	10%
4. university services	17%	4. university services	10%
5. social life - quality of life, friends, love	11%		

source: European study choice platform "Study Portals" (2012)

The problem statement of this section – the campus as a disabler for the European knowledge economy – is summarized in a page-wide cause-effect diagram.

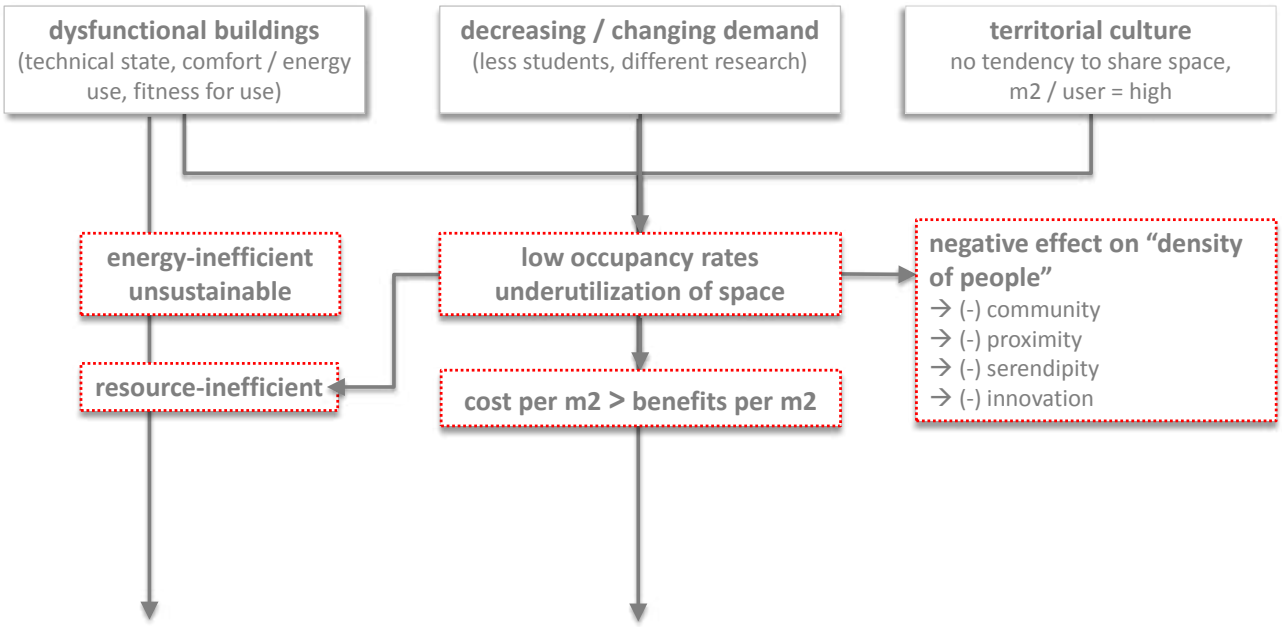
Selling (heritage) buildings, building new and moving to cheaper locations are considered campus decisions that are more likely to hinder Europe 2020 goals. These decisions are summarized in the campus strategy "that separates European campuses from European cities". This strategy has already been implemented at many European universities in the past decades. It can have a negative effect on Europe 2020 for the following reasons:

- the university can loose "sense of place" and unique character, which negatively influences the competitive advantage of the "European campus" and could attract fewer students/staff
- large footprint is (more) expensive to manage, resource-inefficient
- separated campus requires more resources for extra functions: residential, retail & leisure, business, infrastructure
- separating campus & city has negative socio-economic, socio-cultural effects on city

Nonetheless, if the university wants to create a new vibrant 'campus city' (outside the city) and has enough resources to cover the extra costs, this could still be a feasible strategy. Campus planning then becomes urban planning.


Delft, workplaces building at building BK city

European Campus as a Disabler for Europe 2020



campus strategy that separates European campuses from European cities

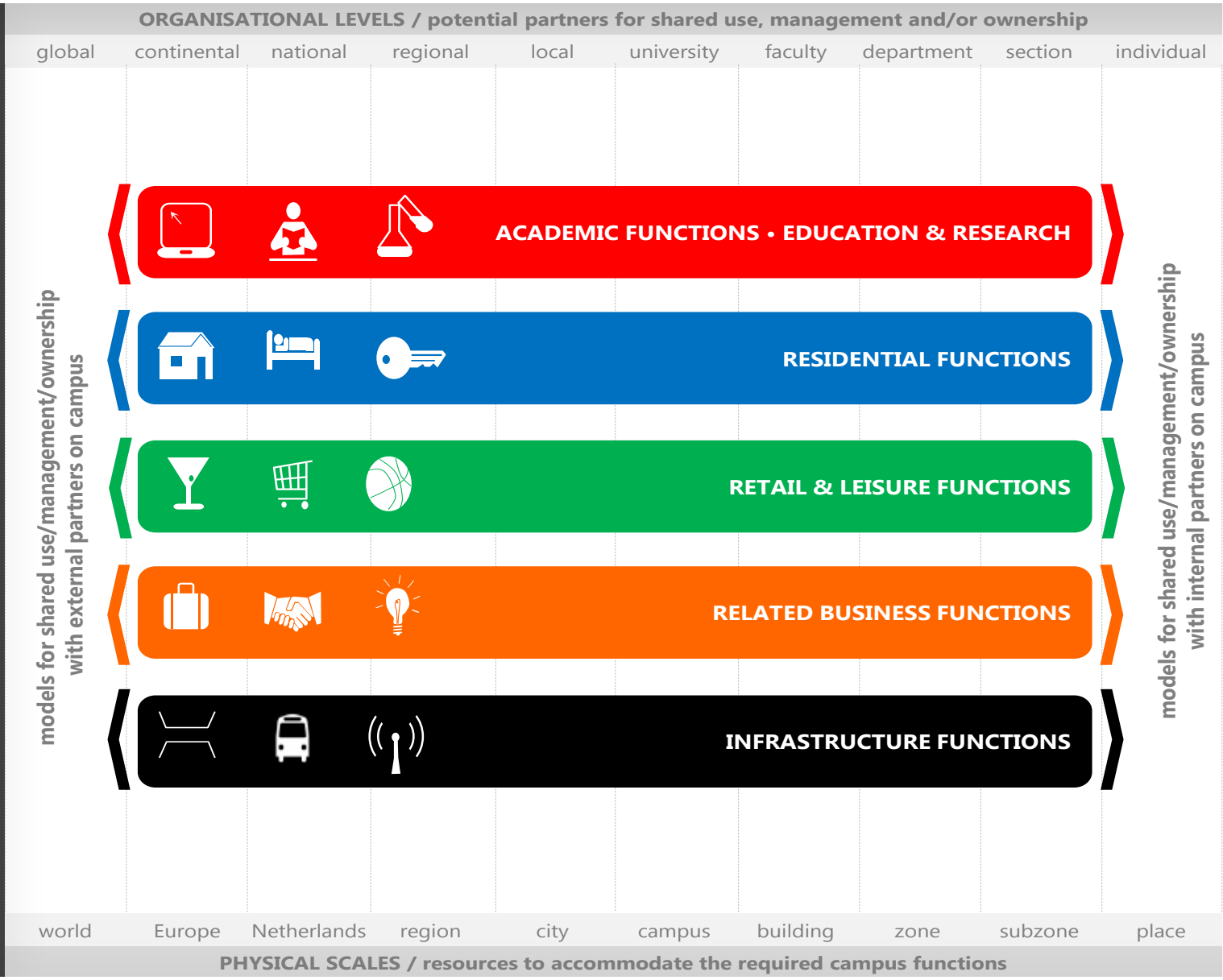
selling (heritage) buildings | **building new** | **moving to cheaper location**

loose "sense of place" **negative effect** on competitive advantage "European campus" fewer students/staff?

large footprint is (more) **expensive** to manage, **resource-inefficient**

separated campus requires **more resources** for extra functions: residential, retail & leisure, business, infrastructure

separating campus & city: **negative** socio-economic, socio-cultural effects on city


ORGANISATIONAL LEVELS / potential partners for shared use, management and/or ownership
global
continental
national
regional
local
university
faculty
department
section
individual
models for shared use/management/ownership with external partners on campus
ACADEMIC FUNCTIONS • EDUCATION & RESEARCH
RESIDENTIAL FUNCTIONS
RETAIL & LEISURE FUNCTIONS
RELATED BUSINESS FUNCTIONS
INFRASTRUCTURE FUNCTIONS
models for shared use/management/ownership with internal partners on campus
world
Europe
Netherlands
region
city
campus
building
zone
subzone
place
PHYSICAL SCALES / resources to accommodate the required campus functions

Campus brief – the campus of the future resembles a city

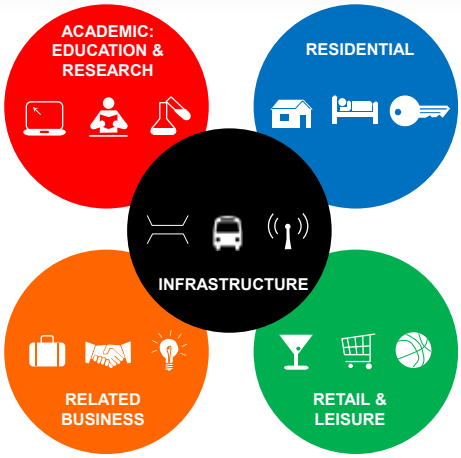
Prior research and the data collection in part B shows that the functional definition of the university campus has moved from (only) academic functions to residential, retail & leisure, related business and the infrastructure that connects these functions – see figure. Increasingly, this so-called brief resembles the brief of a city. This is all the more reason to (re) consider shared facilities.

Today's European campus already shows the functional mix. Of the academic space about 30% is office space and about 20% research space (laboratories or specific facilities), which is increasingly desk research that could also be accommodated in office space. Data from part B also illustrate that many European campuses already accommodate substantial percentages of residential and business floor area.

In the UK 20% of the university campus is student housing; the European average is 5% to 10%, while most universities do not own residential facilities, but have (student) housing associations as partners who accommodate their students. Retail & leisure functions also occupy 5% to 10% of the campus floor area; that includes restaurants, sports and cultural facilities, which adds to the quality of life on campus.

The business functions include service providers, research institutes and the start-ups, also aligning with the entrepreneurial 'triple helix model' of the twenty-first century university (Etzkowitz 2008). Proximity of academic functions to related business functions adds to the opportunities for innovation and valorisation.

The quality of the infrastructure is crucial in proximity issues, while it also determines the perceived distance, measured in traveling time. The social functions (residential and retail & leisure) will sustain innovation in the long term, while knowledge workers – students, staff and visitors – will be more connected and attached to each other and to the urban environment. Consequently, they will be more likely to stay in or come back to the city or region.



- **ACADEMIC**
  classrooms, libraries, offices, meeting rooms, laboratories, lecture halls, workshops, storage space, studios, study places, academic hospital, conference facilities, ...
- **RESIDENTIAL**
  student housing, faculty housing, hotels, short stay housing, housing support staff, alumni housing, ...
- **RELATED BUSINESS**
  accommodation for start-ups, incubators, research institutes, service providers (catering, printing, cleaning, maintenance), other (higher) educational institutions, etc.
- **RETAIL & LEISURE**
  coffee bars, restaurants, cafes, bookshops, supermarket, theatres, cultural facilities, sports, day-care centres, student associations, ...
- **INFRASTRUCTURE**
  public space, parking, bicycle paths, roads, public transport facilities, ...

Figure 15 (left) and 16 (right).
The campus brief comprises five functions that can be provided on different levels and by different stakeholders - the campus strategy in times of limited resources is "to share or not to be" (sharing becomes a positive choice" (Den Heijer 2011).

Reducing m^2 per user is the most resource-efficient strategy

Reducing m^2 per user can be achieved in two ways: less m^2 for the same population or allow more users on existing m^2. Both will add to more production per m^2, higher benefits to cover the (higher) costs per m^2. Reducing the footprint is not just an interesting strategy from a financial and sustainability point of view, it can also benefit the primary processes of the university.

Research (sources) shows that innovation is stimulated by proximity, serendipity and density of people. Density of people also adds to community building, which is increasingly a challenge with a population that can work place-independently. Paradoxically, when activities can take place anywhere, users will have plenty of choice and will find the best possible places for their activities. Places with identity or unique qualities then prevail, which again emphasizes that European universities should at least keep some unique buildings in their campus portfolios.

Key in this campus strategy is the decision to give up territory – to some extent – in order to create a campus that is more flexible for change. Giving up (some) territory can be applied on many levels: from workplace to sharing between university and city population.

Some examples: less-territorial academic workplaces, moving from individual territory: desks, meeting tables, storage space, personal libraries; sharing meeting rooms between departments and using them for education during peak hours; sharing lecture halls, restaurants, libraries between faculties and schools; sharing sports facilities, cultural facilities, student housing with various universities; sharing (coffee) bars, retail functions, restaurants with the city population.

This decision-making process of this "campus strategy with synergy between European campuses & cities" with cause-effect relations is illustrated in a page-wide diagram. This campus strategy starts with the same problems of the current campus: dysfunctional buildings, changing demand and a territorial culture leading to low space utilization rates. The strategy includes the following campus decisions:

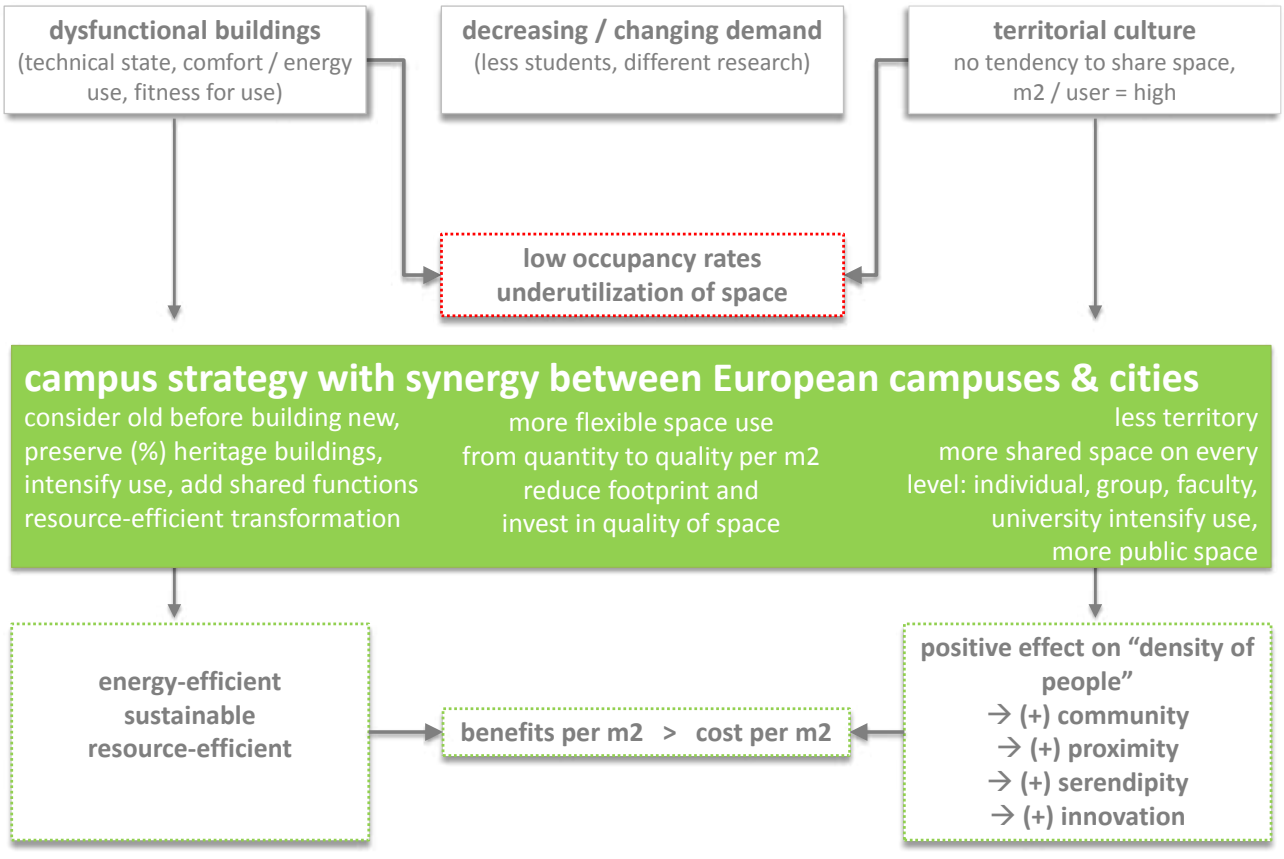
- consider old before building new
- preserve (%) heritage buildings, intensify use, add shared functions to enable the whole university community to make use of these buildings
- assess alternatives for resource-efficient transformation in m^2 and energy use
- implement concepts that lead to more flexible space use, but invest in interior design an express university values and output in public space to avoid "anonymous" and "standardized" spaces
- trade quantity for quality per m^2: reduce footprint and invest in quality of space
- create less territory / more shared space on every level: individual, group, faculty, university
- convert private space to public space
- intensify use of space to increase the benefits per m^2 (to justify the costs per m^2)

These decisions are more likely to support Europe 2020 goals. This strategy has in some countries been implemented by negative choice, while there are not enough resources to build more m^2, for individual offices or for new laboratories for specific user groups. However, in a context with limited resources sharing gradually becomes a positive choice: it is no longer the choice between exclusive use or shared use, but it is the choice between no facilities or shared facilities.

It has a positive effect on Europe 2020 for the following reasons:

- "sense of place" has positive effect on competitive advantage "European campus": students are attracted to cities with quality of life, density of people and unique characteristics, like tourists who choose cities to visit.
- density of people encourages community building – which will attaches people to each other and to a city, region or country – and proximity enables serendipity, which is important for innovation.
- small(er) footprint is (more) resource-efficient in money, energy, CO_2.
- campus in city benefits from urban functions and quality of city.
- integrating campus & city: positive socio-economic, socio-cultural effects on city.

European Campus as a Enabler for Europe 2020



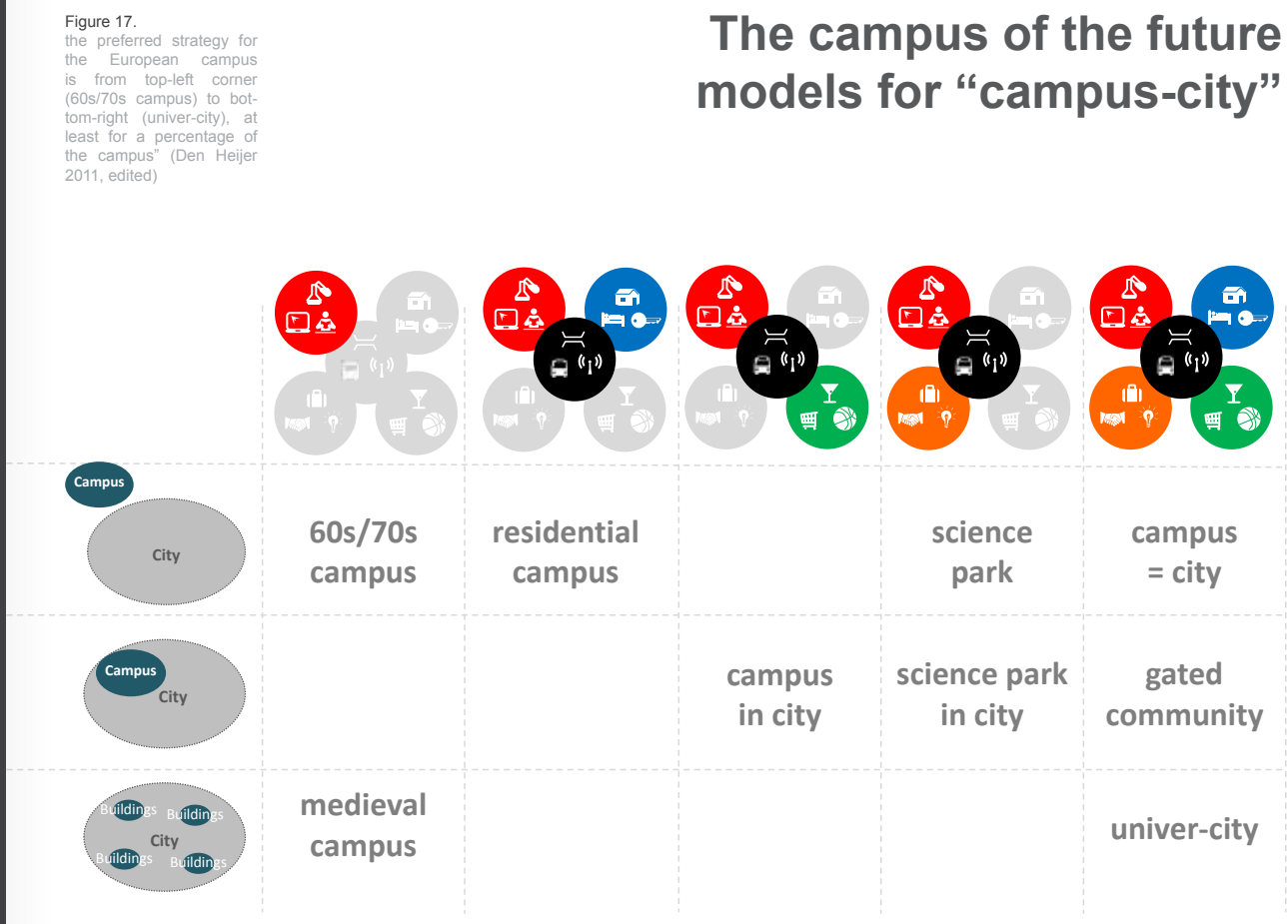
"sense of place"
positive effect on competitive advantage "European campus": attract more students/staff?

small(er) footprint is (more) **resource-efficient** in money, energy, CO_2

campus in city **benefits** from urban functions and quality of city

integrating campus & city: **positive** socio-economic, socio-cultural effects on city

Figure 17.
the preferred strategy for the European campus is from top-left corner (60s/70s campus) to bottom-right (univer-city), at least for a percentage of the campus" (Den Heijer 2011, edited)



Combining the Strategies

Many European universities will claim that some activities need to be isolated from the city or that they can not easily return to the city, while they own property they can not sell. Consequently most universities will combine both campus strategies. Following the campus strategy "with synergy between campus & city" for a small percentage of the floor area can already have benefits for both university population and urban economy. Nonetheless, focusing on separating campus & city for 100% will (in time) negatively affect university performance criteria: competitive advantage, profitability, productivity and sustainable development. Only universities with an abundance of resources could follow this "separation strategy".

Campus strategy – "how to cope with challenges and profit from heritage"

Depending on the current physical setting of the campus – outside the city, as a (gated) community in the city or integrated in the city - other strategies apply. However, there are many benefits for merging campus and city functions, especially for retail & leisure, student housing and the (smaller) related businesses like start-ups. While the city already provides space for social encounters and inspiring places to stay, the quality demand for the campus buildings can be lower.

Alternatively: if a university has to create a brand-new campus outside the city, the university is responsible for (investing in and maintaining) all functions. In a city these tasks are shared.The table below shows a typology of campuses – based on their physical relation to the city (in rows) and the functional mix (in columns). The European campus will (have to) move from the upper-left corner to the bottom-right corner.

The preferred strategy from top-left (60s/70s campus) to bottom-right (univer-city) is a guideline: moving a (small) percentage of the campus to the inner city can already have a large effect on university performance and Europe 2020 goals.

Campus stress test as a decision-support tool: assessment of campus strategies

The next research step – after releasing this book – is focusing on developing a campus stress test as an assessment tool: to evaluate the current campus and to appraise the campus vision. George Tzovlas will dedicate his PhD research, based on the dataset he collected for this book and more information about campus strategies and campus management models in different EU member states.

A "campus stress test" could contain a set of key performance indicators (KPIs) to assess current European campuses and new campus plans (examples of indicators: space utilization in users/ m^2, ecological footprint, inter-university collaboration, total costs of ownership in euros/m^2, % shared university-city functions, effective use of European heritage buildings), using European best practices as references and benchmarks. Assessing past campus decisions – made with EU funding – using these key performance indicators (campus KPIs) is the first step in making a stress test. The European campus research project aims at gathering data for a stress test – or more general: assessment tools – for campus planning (Figure 18). With the development of the campus stress test the next phase will focus on managing the European campus. In European countries many different management models are applied: fully centralized rental models (Sweden, Austria), private company models (Finland) to decentralized ownership models (Netherlands, UK).

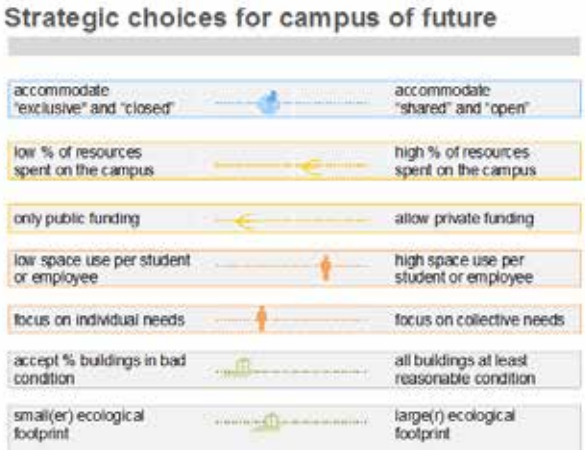


Figure 18.
Campus "stress test" - Simple example of potential variables in a stress test – this research project aims to add ratios to the scales, based on references from 28 EU member states and the next research steps (Den Heijer, 2011).

Some countries are about to change their campus management models (like France and some new EU member states) and are most interested in the evaluation of other models that have been used for decades. This is one of the goals of this research project "(Managing) the European campus": to analyse campus management models and to publish about best practices to support policy makers.

There are some interesting events in the next two years that are relevant for this research:

- From 2014 George Tzovlas will focus his PhD research on this subject.
- From 2014 Alexandra den Heijer and George Tzovlas will explore EC DG Robert-Jan Smits' idea of a "campus stress test", by combining insights from theory and references from practice.
- In 2015 - TU Delft and EUA (European University Association) will organise a seminar "The European campus" also based on this book and for an EUA trend report.
- In 2016 Netherlands will have EU Presidency (1st half 2016) with "Modernizing universities" as a potential topic of the agenda

The topic "Modernising universities" would encompass various governance issues, including campus management. In many European countries there is a mismatch between the ambitious campus plans (and investment programs) and the expertise and capacity of campus management departments.

One of the challenges is to share knowledge about campus management in a European network: knowledge from practice (from benchmark studies and professional networks) and knowledge from theory (produced by academics), or a combination of both.

This book is an invitation for policy makers, campus managers and academics to work with us on this project.

This book is an invitation for policy makers, campus managers and academics to work with us on this project. Updates of this research – new publications, network partners – can be found on the website (see colophon).

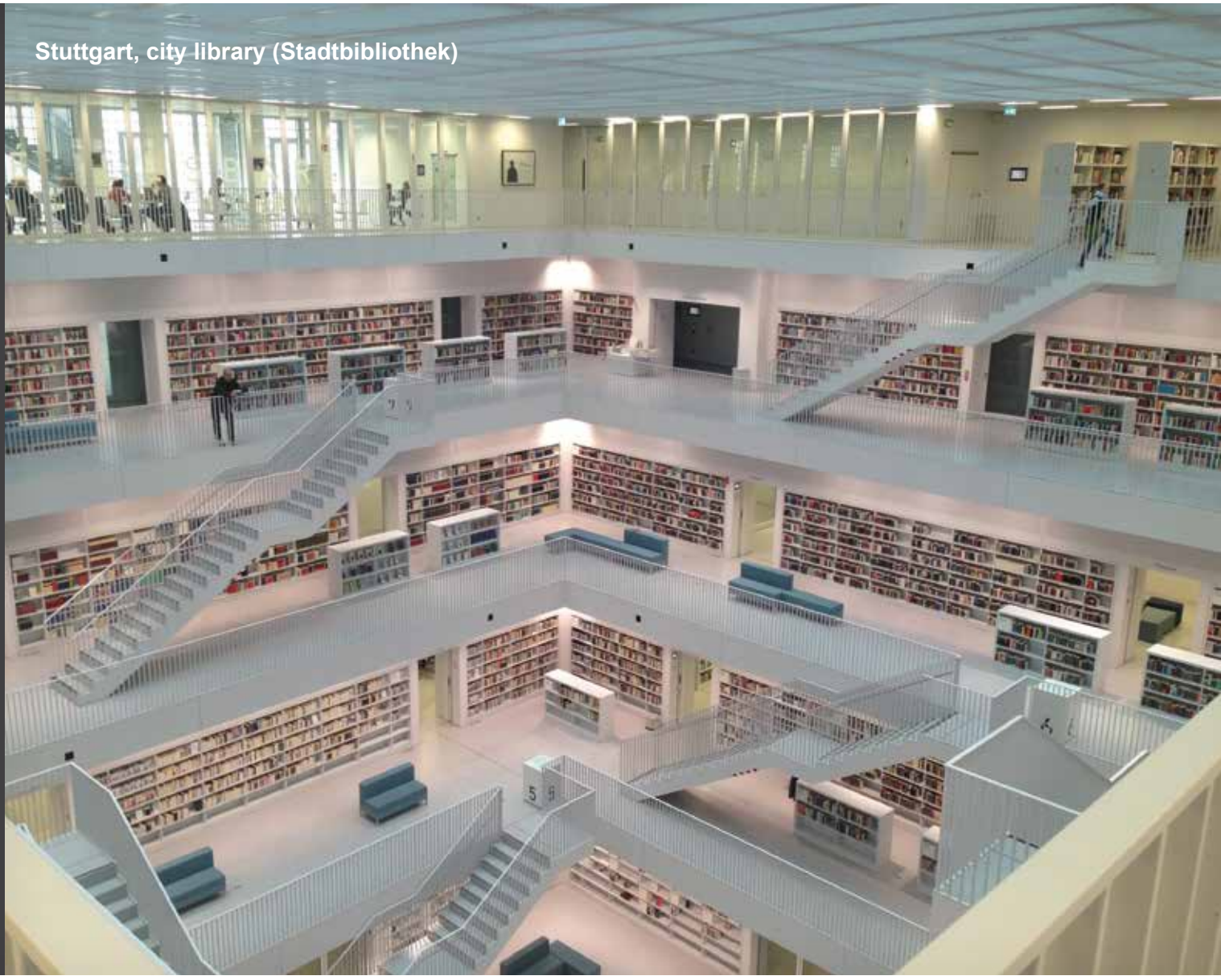
When developing the campus stress test, we will contact U-multirank to align with the higher education context variables as much as possible, like the KPIs for productivity and the number of users (see website: http://ec.europa.eu/education/tools/u-multirank_en.htm).

This book with its many photos that highlight the beauty of Europe, can therefore also be considered a "knowledge tourist's guide to the European campus".

We hope that this research will contribute to making the European campus a more attractive, more effective and more resource-efficient place to learn, work and live. As European citizens – from two different EU member states – we strongly believe in the future of Europe, building on the unique qualities of the past. This book with its many photos that highlight the beauty of Europe, can therefore also be considered a "knowledge tourist's guide to the European campus".

Delft, building BK city

London, King's College London, KCL buildings at Strand in the foreground


Stuttgart, city library (Stadtbibliothek)

Reference list
Part B. 28 EU member states

Austria

BIG. (2013). *Divisions, Universities*. Retrieved November 2013, from Bundes Immobilien Gesellschaft: http://www.big.at/ueber-uns/unternehmensbereiche/universitaeten/

Kottmann, A. (2008). *Higher Education in Austria. Country Report*. Enschede: Centre for Higher Education Policy Studies.

Statistics Austria. (2014). *Educational Expenditure*. Retrieved September 2, 2014, from Statistics Austria: http://www.statistik.at/web_en/statistics/education_culture/formal_education/educational_expenditure/index.html

Statistics Austria. (2014). *Teaching Staff*. Retrieved May 4, 2014, from Statistics Austria: http://www.statistik.at/web_en/statistics/education_culture/formal_education/teaching_staff/index.html

Statistics Austria. (2014, September 2). *Universities, studies*. Retrieved May 4, 2014, from Statistics Austria: http://www.statistik.at/web_en/statistics/education_culture/formal_education/universities_studies/index.html

TU Wien. (2014). *Project Features*. Retrieved September 8, 2014, from Technische Universität Wien - TU University 2015: http://www.university2015.at/en/project_features/

TU Wien. (2014). *TU auf einen Blick*. Vienna: Technische Universität Wien.

VASKO + Partner. (2014). *Projects*. Retrieved 2014, from VASKO + Partner: http://www.vasko-partner.at/en/projects/project-details/vienna-university-of-economics-and-business.html

Belgium

O&O Monitoring. (2009). *Higher education in the Flemish Community of Belgium, the French Community of Belgium, Luxembourg and the Netherlands*. Leuven/Louvain-la-Neuve: Expertisecentrum O&O Monitoring van de Vlaamse Gemeenschap in collaboration with the Flemish Ministry of Education and Training.

Bulgaria

Bekhradnia, B. (2004). *Higher Education in Bulgaria: a Review for the Ministry of Education and Science*. Higher Education Policy Institute.

Euro Education. (2005). *Bulgaria*. Retrieved Apri 8, 2014, from EuroEducation.net: http://www.euroeducation.net/prof/bulgaco.htm

Minedu.government.bg. (2014). *Higher Education, Usefull Information*. Retrieved 2014, from Republic of Bulgaria. Ministry of Education and Science: http://minedu.government.bg/

RSVU. (2013). *Universities*. Retrieved April 8, 2014, from Ministry of Education and Science, Ranking System of universities in Bulgaria: http://rsvu.mon.bg/rsvu3/#UniFilterPlace

Uni-Ruse.bg. (n.d.). *About the University*. Retrieved 2014, from Rousse University “Angel Kanchev”: http://www.uni-ruse.bg/university

Uni-Sofia.bg. (2008). *University, History, Foundation*. Retrieved 2014, from Sofia University “St. Kliment Ohridski”: https://www.uni-sofia.bg/index.php/bul/universitet_t/istoriya/osnovavane

Croatia

EACEA. (2010). *Higher Education in Croatia*. Education, Audiovisual and Culture Executive Agency.

Ožanić, N., & Hero, M. (2014). *The University Campus on Trsat. Zanimljivosti. Sveučilišni kampus u Rijeci.* Retrieved September 9, 2014, from University of Rijeka: http://www.uniri.hr/files/kampus_trsat/zanimljivosti/SVEUCILISNI%20KAMPUS%20U%20RIJECI.pdf

Uniri.hr. (2014). *The University Campus on Trsat*. Retrieved September 9, 2014, from University of Rijeka: http://www.uniri.hr/index.php?option=com_content&view=category&layout=blog&id=71&Itemid=19&lang=en

Unizd.hr. (2014). *About Us*. Retrieved September 9, 2014, from University of Zadar: http://www.unizd.hr/Onama/tabid/55/language/hr-HR/Default.aspx

Unizg.hr. (2014). *About University*. Retrieved September 9, 2014, from University of Zagreb: http://www.unizg.hr/homepage/about-university/

Cyprus

Highereducation.ac.cy. (2014). *Introduction*. Retrieved September 10, 2014, from Cyprus Ministry of Education and Culture, Cyprus Higher Education: http://www.highereducation.ac.cy/en/che-introduction.html

Highereducation.ac.cy. (2014). *Statistics*. Retrieved September 10, 2014, from Cyprus Ministry of Education and Culture, Cyprus Higher Education: http://www.highereducation.ac.cy/en/statistics.html

MBA.ucy.ac.cy. (2014). *State of the Art Teaching Facilities*. Retrieved September 10, 2014, from University of Cyprus MBA program: http://www.mba.ucy.ac.cy/easyconsole.cfm/id/193

Czech Republic

Beneš, J., & Roskovec, V. (2009). *Higher Education in the Czech Republic 2008*. Prague: Ministry of Education, Youth and Sports.

Cuni.cz. (2008). *Prezentace a rozvojové aktivity Univerzity Karlovy v Praze*. Retrieved April 25, 2013, from Charles University: http://www.cuni.cz/files/generel/UK_Generel_020408_web.pdf

Kopicová, M. (2010). *The Strategic Plan for Higher Education Institutions 2011-2015.* Retrieved August 26, 2014, from Ministry of Education Youth and Sports: http://www.msmt.cz/areas-of-work/tertiary-education/the-strategic-plan-for-higher-education-institutions-2011

Koucký, J. (n.d.). *From incremental funding to quality & performance indicators: Reforms of higher education funding in the Czech Republic*. Retrieved August 26, 2014, from European University Association: http://www.eua.be/Libraries/Funding_Forum/EUA_Koucky_article_web.sflb.ashx

Msmt.cz. (2014). *Overview of Higher Education Institutions*. Retrieved April 25, 2013, from Ministry of Education Youth and Sports: http://www.msmt.cz/areas-of-work/tertiary-education/overview-of-higher-education-institutions

Denmark

Bygst.dk. (2013). *Publications. Campus Development Method and Process*. Retrieved Jully 11, 2013, from Bygningsstyrelsen: http://www.bygst.dk/om-os/publikationer/campusudvikling-metode-og-proces/

Bygst.dk. (2014). *About Us*. Retrieved August 26, 2014, from Bygningsstyrelsen:

http://www.bygst.dk/om-os/hvad-laver-bygningsstyrelsen/

UNI•C Statistics & Analysis. (2010). *Facts and Figures 2009. Key Figures in Education 2009*. The Danish Ministry of Education.

Estonia

ENIC.(2012). *Factsheet: Estonia Higher Education*. Estonia. Estonian Network of National Information Centres on Academic Recognition and Mobility

HTM. (2014). *Research Statistics and Databases; Education Expenses; Cost of Education statistics, tables and figures* . Estonia. Estonian Ministry of Education and Research. Web. 12 May 2014.

OECD.(2012). *Education at a Glance. OECD Indicators.* Organisation for Economic Co-operation and Development. OECD Publishing.

Tõnisson, E.(2011). *KÕRGHARIDUSE VALDKONNA STATISTILINE ÜLEVAADE*. Tartu. Estonian Ministry of Education and Research.

Finland

EC. (2013). *Education and Training*. Retrieved August 29, 2014, from European Commission: http://ec.europa.eu/education/library/publications/monitor13_en.pdf

OKM. (2009). *Higher Education Institutions 2009 - Universities and Polytechnics as Implementers of Higher Education Policy*. Finland: The Ministry of Education.

France

Belghith, F. et al. (2013). *L'état de l'Enseignement supérieur et de la Recherche en France.* Paris. Ministère de l'Education nationale, de l'Enseignement supérieur et de la Recherche.

Abriac, D. et al. (2012). *Repères et références statistiques sur les enseignements, la formation et la recherche.* Paris. Ministère de l'Education nationale, de l'Enseignement supérieur et de la Recherche.

Benneworth, P. (2010). *Super-campus booster*. Times Higher Education.

Cours de Comptes. (2009). *Rapport public annuel 2009; La gestion de leur patrimoine immobilierpar les universités, condition d'uneautonomie assumé*. France.

Marshall, J. (2012). *Relaunch of huge Operation Campus funding plan.* University World News.

Germany

Destatis.de. (2013). *Presse - Pressemitteilung Nr. 169 vom 22.05.2013.* Retrieved September 2, 2014, from Statistisches Bundesamt: https://www.destatis.de/DE/PresseService/Presse/Pressemitteilungen/2013/05/PD13_169_213.html

Fu-Berlin.de. (2013). *Excellence Initiative.* Retrieved September 2, 2014, from Freie Universität Berlin: http://www.fu-berlin.de/en/sites/inu/network-university/excellence-initiative/index.html

HRK.de. (2013). *Higher Education Institutions in Figures*. Retrieved April 23, 2013, from German Rectors' Conference.

HRK.de. (2014). *Higher Education Finance*. Retrieved September 2, 2014, from German Rectors' Conference: http://www.hrk.de/activities/higher-education-finance/

HRK.de. (2014). *Higher Education in Germany*. Retrieved September 2, 2014, from German Rectors' Conference: http://www.hrk.de/activities/higher-education-system/

Greece

HQAA. (2011). *Universities' Cost Analysis*. Athens. Hellenic Republic. Hellenic Quality Assurance and Accreditation Agency

Tzovlas, G. (2013). *Strategic Management of University Real Estate supported by BIM: An application to the real estate of the Greek University A.U.Th*. Faculty of Architecture, Department Real Estate & Housing. Delft, Delft University of Technology. MSc thesis.

Hungary

Balázs, É., Derényi, A., Fehérvári, A., Györgyi, Z., Híves, T., Imre, A., et al. (2011). *Facts & Figures. Higher Education in Hungary 2011*. Hungary: Hungarian Institute for Educational Research and Development.

Db.nefmi.gov.hu. (2009). *Felsőoktatási Statisztikai Adatok 2009*. Retrieved April 23, 2014, from Ministry of National Resources: http://db.nefmi.gov.hu/statisztika/fs09_fm/Default.aspx

Eurypedia. (2013). *Hungary: Funding in Education*. Retrieved April 23, 2014, from Eurydice: https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/index.php/Hungary:Funding_in_Education

Ireland

Education.ie. (2014). *Higher Education*. Retrieved August 28, 2014, from Department of Education and Skills: http://www.education.ie/en/The-Education-System/Higher-Education/

HEA. (2013). *Towards a Performance Evaluation Framework: Profiling Irish Higher Education*. Ireland: Higher Education Authority.

Italy

EUA. (2014). *Public Funding Observatory*. Retrieved May 14, 2014, from European University Association: http://www.eua.be/publicfundingobservatory

MIUR. (2003). *Italian Higher Education - An International Guide*. Rome: Ministro dell'Istruzione dell'Università e della Ricerca.

MIUR. (2011). *Gli Studenti*. Rome: Ministro dell'Istruzione dell'Università e della Ricerca.

MIUR. (2011). *Le Risorse dell' Universita*. Rome: Ministro dell'Istruzione dell'Università e della Ricerca.

Latvia

Latvijas Statistika. (2014). *IZG25. HIGHER EDUCATION INSTITUTIONS BY LEGAL STATUS*. Retrieved September 1, 2014, from Central Statistical Office Databases - Centralas Statistikas Parvaldes Datu Bazes: http://data.csb.gov.lv/pxweb/en/Sociala/Sociala__ikgad__izgl/IZ0250.px/table/tableViewLayout1/?rxid=a5765f7e-caab-4303-9ee5-86c77f175d5f

Latvijas Statistika. (2014). IZG33. *EXPENDITURE ON EDUCATION (mln euro)*. Retrieved September 1, 2014, from Central Statistical Office Databases - Centralas Statistikas Parvaldes Datu Bazes: http://data.csb.gov.lv/pxweb/en/Sociala/Sociala__ikgad__izgl/IZ0330_euro.px/table/tableViewLayout1/?rxid=a5765f7e-caab-4303-9ee5-86c77f175d5f

Ministry of Education and Science. (2014). *Higher Education*. Retrieved September 1, 2014, from Ministry of Education and Science: http://izm.izm.gov.lv/education/higher-education.html

VIAA. (2014). 3.1.2.1.1. *"Higher education institutions in the modernization of the premises and facilities to improve the quality of education, including providing education Opportunities for people with disabilities"*. Retrieved September 1, 2014, from State Education Development Agency: http://sf.viaa.gov.lv/lat/augstaka_izglitiba/augst_izgl_apakshsad/?tl_id=13936&tls_id=11451

Lithuania

Daniunas, A., & Radzeviciene, A. (2009). Lithuanina Higher Education System: State of the Art. Vilnius: Vilnius Gediminas Technical University.

Pociute, B., Dikcius, G., & Pikturna, A. (2007). Funding Reform of Higher Education in Lithuania: Ideas and Reality. Innsbruck: The European Higher Education Society.

Luxembourg

EMI. (2013, June 26). *Urban renewal project Esch Belval : From Luxembourg's largest steelworks to a dynamic mixed-use city quarter*. Retrieved September 3, 2014, from European Metropolitan Network Institute: http://www.emi-network.eu/Research/Polycentric_metropolitan_areas/News_publications/Urban_renewal_project_Esch_Belval_From_Luxembourg%E2%80%99s_largest_steelworks_to_a_dynamic_mixed_use_city_quarter

European Commission. (n.d.). *Economic and Financial Affairs. Annex: Country Fiche Luxembourg*. Retrieved September 3, 2014, from ec.europa.eu: http://ec.europa.eu/economy_finance/publications/occasional_paper/pdf/country_fiches/luxembourg.pdf

Le Fonds Belval. (2012). Bilan 2011. Esch-sur-Alzette: Le Fonds Belval.

O&O Monitoring. (2009). *Higher education in the Flemish Community of Belgium, the French Community of Belgium, Luxembourg and the Netherlands*. Leuven/Louvain-la-Neuve: Expertisecentrum O&O Monitoring van de Vlaamse Gemeenschap in collaboration with the Flemish Ministry of Education and Training.

Tarrach, R. (2005). *Strategic Framework for the Université du Luxembourg, 2006-2009, 2010-2015*. Luxembourg: University of Luxembourg.

Uni.lu. (2014). Campus Belval. Retrieved 2014, from The University of Luxembourg: http://wwwen.uni.lu/university/campus_belval

Malta

Camilleri, J. (2010). *2020 Vision or Optical Illusion?* Malta: University of Malta.

NCFHE. (2012). *Further and Higher Education Statistics 2011*. Malta: National Commission for Further and Higher Education.

UM.edu.mt. (2014). *The Campuses*. Retrieved 2014, from The University of Malta: http://www.um.edu.mt/about/uom/campuses

Netherlands

Den Heijer, A. (2011). *Managing the university campus – Information to support real estate decisions*. Delft: Eburon Academic Publishers, March 2011.

Poland

GUS. (2013). *Higher Education Institutions and their Finances in 2012*. Warsaw: Central Statistical Office.

Herbst, M., & Rok, J. (2010). *The Equity of the Higher Education System: Case Study-Poland*. Centre for European Regional and Local Studies, University of Warsaw.

Portugal

CRUP. (2013). *Financing*. Retrieved October 14, 2013, from Conselho de Reitores das Universidades Portuguesas: http://www.crup.pt/images/documentos/Financiamento/Evoluo_Oramental.pdf

CRUP. (2013). *Statistics*. Retrieved October 13, 2013, from Conselho de Reitores das Universidades Portuguesas: http://www.crup.pt/en/university-education/statistics

File, J. (2008). *Higher Education in Portugal*. Enschede: Center for Higher Education Policy Studies.

Romania

Ilie, A. G., Dumitriu, D., Zaharia, R. M., & Colibasanu, O. A. (2009). *Public Expenditure on Higher Education. Case Study: Romanian Universities*. International Review of Business Research Papers, Vol.5 No. 1, 28-36.

BUASVMT. (2012). *Self Evaluation Report*. Timişoara: Banat's University of Agricultural Sciences and Veterinary Medicine of Timişoara.

ICHEFAP. (2008). *Higher Education Finance and Cost-Sharing in Romania*. The International Comparative Higher Education and Finance Project.

Pierson, C., & Odsliv, M. (2012). *Perspectives and Trends on Education in Romania: A Country in Transformation*. International Journal of Humanities and Social Science, Vol.2. No. 12.

Slovakia

CPU. (2006). *Selft-Evaluation Report of Constantine the Philosopher University in Nitra*. Nitra: Constantine the Philosopher University in Nitra.

ERAWATCH. (n.d.). *Higher Education Institutions*. Retrieved September 4, 2014, from ERAWATCH Platform on Research and Innovation Policies and Systems: http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/sk/country?section=ResearchPerformers&subsection=HigherEducationInstitutions

Jensen, H. T., Kralj, A., McQuillan, D., & Reichert, S. (2008). *The Slovak Higher Education System and its Research Capacity*. EUA Sectoral Report. Brussels: European University Association.

Minedu.sk. (2014). *Colleges in SR*. Retrieved 2014, from Ministry of Education, Science, Research and Sport of the Slovak Republic: http://www.minedu.sk/vysoke-skoly-v-sr/

Slovenia

CMEPIUS. (2011). *Higher Education in Slovenia*. Ljubljana: Centre of the Republic of Slovenia for Mobility and European Educational and Training Programmes.

Komljenovič , J., & Marjetič , E. (2010). *DRZNA SLOVENIJA: na poti v družbo znanja.* Ljubljana: Ministry of Higher Education, Science and Technology.

Skrbinjek, V., & Lesjak, D. (2013). I*mpact of the Financial and Economic Crisis on Public Expenditure on Higher/Tertiary Education in Europe and Slovenia.* ToKnow Press.

UM. (2012). *Documents.* Retrieved September 5, 2014, from University of Maribor: http://www.um.si/univerza/infrastruktura/konferencneDvoraneInPredavalnice/Documents/cene_predavalnic_in_dvoran_USM_zunanji.pdf

UM. (2014). *Facts about University of Maribor*. Retrieved September 5, 2014, from University of Maribor: http://www.um.si/en/about/About/Pages/Facts-about-University-of-Maribor.aspx

UP. (2013). *UP – LETNO POROČILO ZA LETO 2012 (Annual Report for 2012)*. Koper: University of Primorska.

Spain

CRUE. (2012). *La Universidad Española en cifras 2012*. Conferencia de Rectores de las Universidades Españolas.

OECD. (2010). *Developing International Campuses of Excellence in Spain*. Organisation for Economic Co-operation and Development .

Sweden

Akademiska HUS. (2013). *Akademiska HUS Annual Report 2012*. Göteborg: Akademiska HUS.

HSV. (2012). *Swedish Universities & University Colleges - Short Version of Annual Report 2012*. Stockholm: Högskoleverket (Swedish National Agency for Higher Education).

United Kingdom

AUDE. (2013). *Estates: The Foundations of Higher Education - Higher Education Estate Statistics 2011/2012*. Cambridge: Association of University Directors of Estates.

AUDE. (2013). *Report & Review 2012/13*. Cambridge: Association of University Directors of Estates..

AUDE. (2014). *About AUDE*. Retrieved August 29, 2014, from AUDE Excellence in Estates and Facilities: http://www.aude.ac.uk/about/

Baskerville, S. (2013). *A Guide to UK Higher Education and Partnerships for Overseas Universities* . UK: UK Higher Education International Unit.

HEFCE. (2014). *Higher Education in England 2014. Analysis of Latest Shifts and Trends*. Bristol: Higher Education Funding Council for England.

HESA. (2013). *Contents of 'Estates Management Record' - Download, 2011/12 - Environmental Information Statistics*. Retrieved February 11, 2014, from Higher Education Statistics Agency: https://www.hesa.ac.uk/index.php?option=com_pubs&Itemid=&task=show_year&pubId=1736&versionId=55&yearId=287

HESA. (2014). *Free Online Statistics - Students and Qualifiers*. Retrieved August 28, 2014, from Higher Education Statistics Agency: https://www.hesa.ac.uk/content/view/1897/239/

Part A and Part C.

Blyth, A. and J. Worthington (2001). Managing the brief - for better design. London, Spon Press.

Chapman, M. Perry (2006), *American Places, in search of the twenty-first century campus*, ACE, American Council on Education.

Curvelo Magdaniel, Flavia (2010), "Management of public university campus as real estate object. The case of the university City of Bogota, Colombia." MSc Thesis – Faculty of Architecture (mentors: Den Heijer, A.C. and Chen, Y.), 2010-06-29.

Curvelo Magdaniel, Flavia (2012), "The University Campus as a Real Estate Object and its Development in the Context of the Knowledge Economy" in Proceedings of IFKAD-KCWS 2012, Matera (IT), 13-15 June 2012.

Den Heijer, Alexandra and Flavia Curvelo Magdaniel, Salome Bentinck (2013), "HOI Benchmark 2012-2013, 17 recent Dutch university campus projects", report for HOI, March 2013.

Den Heijer, Alexandra (2011), *Managing the university campus – Information to support real estate decisions,* Delft: Eburon Academic Publishers, March 2011.

DCLG. (2012). *Improving the Energy Efficiency of our Buildings - A guide to display energy certificates and advisory reports for public buildings*. London: Department for Communities and Local Government.

Dober, R. P. (2005). *Campus Heritage; an appreciation of the History & Traditions on College and University Architecture,* Ann Arbor, SCUP - Society for College and University Planning.

Reference list

EHEA. (2014). *The framework of qualifications for the European Higher Education Area.* Retrieved May 20, 2014, from European Higher Education Area website 2010-2020: http://www.ehea.info/Uploads/Documents/QF-EHEA-May2005.pdf

Etzkowitz, H. (2008). *The triple helix, University-Industry-Government, innovation in action*. New York, Routledge.

EUA. (2014). *Public Funding Observatory*. Retrieved May 14, 2014, from European University Association: http://www.eua.be/publicfundingobservatory

EUROSTAT. (2013). *Education and Training*. Retrieved June 1, 2013, from European Comission Eurostat: http://epp.eurostat.ec.europa.eu/portal/page/portal/education/data/database

EUROSTAT. (2013). *Population on 1st January*. Retrieved June 1, 2013, from European Comission Eurostat: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&language=en&pcode=tps00001&tableSelection=1&footnotes=yes&labeling=labels&plugin=1

Hoeger, K. and K. Christiaanse, Eds. (2007), *Campus and the City, Urban Design for the Knowledge Society.* Zürich, gta Verlag / ETH Zürich.

IU.QS.com . (2013). *2012 QS World University Rankings® Result tables – Excel format*. Retrieved June 1, 2013, from QS Intelligence Unit: http://www.iu.qs.com/product/2012-qs-world-university-rankings-result-tables-excel-format/

Maslow, A.H. (1954). *Motivation and Personality.* New York, Harper and Row.

OECD.(2012). *Education at a Glance. OECD Indicators.* Organisation for Economic Co-operation and Development. OECD Publishing.

OECD (2014), "Education a a glance 2013." Retrieved January 2014, from www.oecd.org/edu/eag2013.

Perry, D.C., W. Wiewel and C. Menendez (2009), "The University's Role in Urban Development: from enclave to anchor institution" in *Land Lines*, Cambridge, MA, Lincoln Institute of Land Policy.

Pedersen, O. (1998), *The First Universities: Studium Generale and the Origins of University Education in Europe,* Cambridge University Press.

Ruegg, W. (2004), *A History of the University in Europe,* Cambridge University Press, Cambridge.

Study Portals (2012), data presented at Class of 2020 "Investing in Student Housing" conference October 30, 2012, see http://www.study-portals.eu/ for more recent info.

Tzovlas, George (2013), "Strategic Management of University Real Estate supported by BIM: An application to the real estate of the Greek University A.U.Th." MSc Thesis – Faculty of Architecture (mentors: Koutamanis, A. and Den Heijer, A.C.), 2013-01-23.

Van den Berg, L., P.M.J. Pol, W. van Winden and P. Woets (2005), *European cities in the knowledge economy: the cases of Amsterdam, Dortmund, Eindhoven, Helsinki, Manchester, Munich, Münster, Rotterdam and Zaragoza,* Ashgate.

Van der Zanden, A.H.W. (2009), *The facilitating university, positioning next generation educational technology.* Faculty of Technology, Policy & Management. Delft, Delft University of Technology. PhD thesis.

Wissema, J.G. (2009), Towards the third generation university; managing the university in transition. Cheltenham, Edward Elgar.

Worthington, J. (2007), European Universities - Ivory Tower of City Quarter? Competitive Campuses, June 13-15, 2007, Trondheim, Norway, NTNU.

Further Reading

Den Heijer, Alexandra (2013), "Campus of the Future in a Building of the Past" / "Fremtidens campus i en fortidsbygning" in Schmidt, Cathrine and Mikkel Ramskov, Karen Broberg Mortensen (2013), *Campus development – method and process / Campusudvikling – metode og proces*, Valby: Bygningsstyrelsen, 2013.

Den Heijer, Alexandra and Flavia Curvelo Magdaniel, Salome Bentinck (2013), "HOI Benchmark 2012-2013, 17 recent Dutch university campus projects", report for HOI, March 2013.

Den Heijer, Alexandra and Flavia Curvelo Magdaniel (2012), "The university campus as a knowledge city: exploring models and strategic choices", in *International Journal of Knowledge-Based Development*, 2012.

Curvelo Magdaniel, Flavia (2012), "The University Campus as a Real Estate Object and its Development in the Context of the Knowledge Economy" in Proceedings of IFKAD-KCWS 2012, Matera (IT), 13-15 June 2012.

Den Heijer, Alexandra, "Managing the university campus: exploring models for the future and supporting today's decisions" in *CELE Exchange* 2012/2, Paris, OECD, July 2012.

Den Heijer, Alexandra and Hans de Jonge (2012), "Adding value – linking decisions and performance" in *The Added Value of Facilities Management*, Lyngby (Denmark): Polyteknisk, May 2012.

Den Heijer, Alexandra and Peter Teeuw (2011), "Sustainable visions for the campus of the future", MISBE 2011, Management and Innovation for a Sustainable Built Environment, 20-23 June 2011, Amsterdam, The Netherlands.

Den Heijer, Alexandra (2011), *Managing the university campus – Information to support real estate decisions,* Delft: Eburon Academic Publishers, March 2011.

Visits to/from European universities

All presentations below were given in the period May 2011 to October 2014 by Alexandra den Heijer for (delegates of) European universities about managing the university campus. For more information, links to (conference) websites and hand-outs of presentations: www.managingth-euniversitycampus.nl/tour and /downloads

October 16, 2014 - Tallinn, Estonia – presentation with George Tzovlas at Tallinn University of Technology / Tallinna Tehnikaülikool (TTÜ) at the annual conference of CESAER: the Conference of European Schools for Advanced Engineering Education and Research.

September 3, 2014 – presentation in Heidelberg, Germany for symposium "Geographies of the University" at the 12th Knowledge & Space symposium, by invitation of Ruprecht-Karls-Universität Heidelberg, Geographisches Institut.

July 1, 2014 – presentation in London at the conference: "Learning Environments: Future-Proofing our Education Space".

May 26, 2014 – presentation (in Delft) with George Tzovlas about the draft version of this "European Campus" book for delegates European University Association (EUA), European Commission and policy makers.

March 27, 2014 – presentation in Lisbon, Portugal at a conference about future learning environments, by invitation of Instituto Superior Técnic (IST).

February 14, 2014 – presentation (in Delft) for the University of Manchester.

February 7, 2014 – presentation (in Stuttgart) for the "Campus 2030 - Stadtquartiere für Wissenskultur" symposium by invitation of Universität Stuttgart, Fakultät Architektur und Stadtplanung, Städtebau-Institut.

January 15, 2014 – presentation (in Delft) Sveriges lantbruksuniversitet (SLU) / Swedish University of Agricultural Sciences in Alnarp, Sweden.

December 18, 2013 – presentation (in Delft) for the University of Reading, UK.

December 13, 2013 - Skype presentation (in Delft) for executive board members of Dutch universities.

November 13, 2013 – presentation in Amsterdam, for the Class of 2020 conference "The Next European Renaissance" (about the campus of the future).

October 22, 2013 – presentation about European campus in Brussels by invitation of the European Commission – ERAC Working Group on Knowledge transfer.

September 20, 2013 – lecture (in Delft) for a group of NTNU professors and students (Norwegian University of Science & Technology).

June 21, 2013 – presentation (in Santpoort) about campus & the city at a VSNU (Dutch association of universities) seminar for board members of Dutch universities.

June 14, 2013 – presentation about "Univer-Cities" in Bochum, Germany by invitation of the C60/Collaboratorium for Ruhr-University Bochum and Bochum University of Applied Sciences, Germany.

April 29, 2013 – presentation in Prague for Charles University, Czech Republic.

April 11, 2013 – presentation (in Delft) for Vrije Universiteit Brussel (VUB).

March 12, 2013 - presentation (in Delft) for Linköping University, Sweden.

February 28, 2013 – presentation (in Delft) for delegates of Chalmers University of Technology, Göteborg and Akademiska Hus, Sweden.

February 20, 2013 – presentation in Stuttgart at seminar "UniverCity", by invitation of Städtebau-Institut Universität Stuttgart, Germany.

January 30, 2013 – presentation (in Delft) for a Swedish group Akademiska Hus, Stockholm University, KTH Stockholm.

December 21, 2012 – presentation in Sweden for Linköping University.

November 8, 2012 – discussions at Gent University, Belgium (campus & city and student housing).

October 25, 2012 – presentation (in Delft) for Hochschule Bochum.

October 11, 2012 – presentation in Prague, Czech Republic by invitation of the Czech Ministry of Education, Youth & Sports (Ministerstvo školství, mládeže a tělovýchovy).

October 3, 2012 – presentation (in Delft) for delegation Technical University of Denmark.

September 6, 2012 – presentation in Manchester, UK for the University of Salford.

May 23-26, 2012 – visits and discussions at universities Madrid/Toledo, Spain: University of Alcalá, University UNED, Technical University of Madrid (UPM), University Carlos III (UC3M) and University of Castilla-La Mancha (UCLM).

April 26-27, 2012 – presentations in Helsinki for KIINKO and for the University of Helsinki.

April 2, 2012 – presentation in Loughborough, UK at the annual AUDE conference "Leading the way" (AUDE is the Association of University Directors of Estates in the United Kingdom).

March 23, 2012 – presentation in Warwick, UK with Hans Beunderman at the annual conference of EUA / European University Association (about sustainable European campuses).

March 8, 2012 – presentation (in Groningen) for a German group from Hochschul-Informations-System (HIS), organized by Groningen University to compare the Dutch and German situation at universities (and university campuses).

January 27, 2012 – presentation (in Utrecht) about changing academic workplace, for delegates all Dutch universities.

January 19, 2012 – presentation at Finnish conference about Future Learning Environments (Aalto University, location Venture Garage, Otaniemi Campus, Espoo)

January 13, 2012 – presentation at University of Strathclyde in Glasgow about changing academic workplace.

November 26, 2011 – presentation and workshop in Brussels at HUMANE seminar "Sustainable universities" – with policy makers from many European countries.

November 24, 2011 – presentation (in Delft) for Finnish real estate delegates about campus management theory.

November 2, 2011 – presentation in Barcelona at a conference "Social Learning Space" by invitation of The Spanish Ministry of Education.

October 6, 2011 – presentation (in Rotterdam) for Masterclass "Campus of the Future" for French and Dutch delegates, related to French/Dutch universities, hosted by Erasmus University Rotterdam (EUR) and Réseau Franco-Néerlandais.

September 1-2, 2011 – presentation in Inverness, Scotland at the SAUDE conference (Scottish association of university directors of estate).

August 29, 2011 – presentation (in Delft) for the Swedish colleagues of Akademiska Hus and Lund University.

July 7, 2011 – presentation (in Utrecht) for a French university delegation, hosted by Utrecht University, by invitation of Réseau Franco-Néerlandais.

May 25-28, 2011 – visits and discussions at German universities – TU München, Stuttgart Universität, Heidelberg Universität – with campus directors of all Dutch universities.

May 17-19, 2011 – visits and discussions at Scottish universities – University of Edinburgh, University of Glasgow – about student housing.

N.B. This list excludes all presentation for non-European universities, small delegations of individual European universities visiting Delft and presentations at academic conferences.

Campus Management Organisations

HOI (NL) – representing campus directors of all Dutch universities

AUDE (UK) – Association of University Directors of Estate, representing campus

SAUDE (UK/Scotland) – Scottish Association of University Directors of Estate, representing campus directors of all Scottish universities

NUAS (Nordic countries) – Nordic Association of University Administrators

HIS (Germany) - Hochschul- Informations-System – representing and supporting German universities

Academiska Hus (Sweden) – managing campuses for all Swedish universities

BIG (Austria) – Bundesimmobiliengesellschaft, managing and owning campuses of 21 Austrian universities

Aaltonet, Hykoy, Kykoy (Finland) - managing campuses of 15 Finnish universities

Definitions and Abbreviations

Campus management: matching the university campus with the changing context and various stakeholder's demands, adding value to the university's performance.

Campus manager: person responsible for campus management at a university, in this research mostly the campus director or his/her replacement; in UK 'estate manager', in USA 'campus planner' or 'facilities manager'.

University: the focus of the research is on Higher Education Institutions (HEI) that provide PhD education (3rd Cycle), recognised in EU member states as universities.

University campus: land and buildings, used for university or university-related functions, either rented or owned by the university, not necessarily on one location.

University of applied science: institution for higher professional education (HBO, hogeschool in Dutch).

The university's performance: the university's productivity, profitability and competitive advantage; this research also adds to sustainable development.

Abreviations

AUDE	Association of University Directors of Estates
CESAER	Conference of European Schools for Advanced Engineering Education and Research – see www.cesaer.org
DEC	Display Energy Certificate for large public buildings (>500 m2)
EC	European Commission
ERAC	European Research Area and Innovation Committee; The Committee is a strategic policy advisory committee whose principal mission is to provide timely strategic input to the Council, the Commission and Member States on research and innovation issues that are relevant to the development of the European Research Area.
EU	European Union
EU 28	European Union – 28 member states (October 2014) – see list*
EUA	European University Association – see website www.eua.org
Europe 2020:	the EU's strategy for jobs and smart, sustainable and inclusive growth – see website: http://ec.europa.eu/europe2020/index_en.htm
GFA	Gross Floor Area (equivalent to 'bvo', 'bruto vloeroppervlak' in Dutch)
HE	Higher Education
HEI/HEIs	Higher Education Institution(s)
HIS	Hochschul-Informations-System GmbH
HUMANE	Heads of University Management & Administration Network Europe
KPI / KPIs	key performance indicator(s)

Heidelberg, university library (Universitätsbibliothek)

Delft, bicycles at campus TU Delft

Propositions in 8 European languages

English (UK) – Spanish (ES) – Dutch (NL) – German (DE) – French (FR) – Swedish (SE) – Czech (CZ) – Portugese (PT)

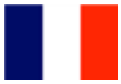
Thanks to hosts of various European conferences, who were willing to translate some of the most used PhD propositions of "Managing the university campus" (Den Heijer 2011).

Each university goal can be frustrated by the physical campus.
The campus of the future is a city.
The innovative and flexible knowledge economy can bring new life to obsolete industrial heritage buildings.
It takes a crisis – for example a fire – to change the academic workplace.

Cada meta universitaria puede verse frustrada por el campus físico.
El campus del futuro es una ciudad.
La economía del conocimiento innovadora y flexible puede traer nueva vida a edificios industriales de carácter patrimonial considerados obsoletos.
Se necesita un crisis – por ejemplo un incendio – para cambiar el espacio de trabajo académico.

Elke universiteitsdoelstelling kan door de fysieke campus worden gefrustreerd.
De campus van de toekomst is een stad.
De innovatieve en flexibele kenniseconomie kan nieuw leven geven aan industrieel erfgoed.
Er is een crisis voor nodig – bijvoorbeeld een brand – om de academische werkplek te veranderen.

Jedes Hochschulziel kann durch die baulichen Gegebenheiten des Campus kon-terkariert werden.
Der Campus der Zukunft ist eine Stadt.
Die innovative und flexible Wissensgesellschaft/ Wissensökonomie kann neues Leben in veraltete Industriebaudenkmäler bringen.
Es benötigt krisenhafter Ereignisse, z. B. einen Brand, um den akademischen Arbeitsplatz zu ändern.



Chaque objectif universitaire peut être contrecarré par la réalité physique du campus.
Le campus de l'avenir est une ville.
L'économie du savoir, novatrice et flexible peut apporter une nouvelle vie à des bâtiments délaissés et issus du patrimoine industriel.
Une crise de taille (incendie) est actuellement nécessaire pour espérer un éventuel changement de lieu de travail académique.

Universitetets campusområde kan utgöra ett hinder för lärosätet att uppnå sina mål.
Framtidens campus är en stad.
En innovativ och flexibel kunskapsmiljö kan ge nytt liv åt från början icke ändamålsenliga industrilandskap.
En ytterlighet, till exempel en brand, kan vara det enda sättet att förändra den akademiska arbetsplatsen.

Každý cíl vysoké školy může být zmařen kampusem / infrastrukturou.
Kampus budoucnosti je město.
Inovativní a flexibilní ekonomika založená na znalostech může vnést nový život do zastaralých průmyslových historických budov.
Ke změně akademického pracoviště může pomoci krize – například požár.

As instalações do campus podem afectar os objectivos da universidade.
O campus do futuro é uma cidad.
A economia de conhecimento que é inovadora e flexível pode trazer uma nova vida aos edifícios obsoletos de herança industrial.
É necessário uma crise- por exemplo um fogo- para alterar as instalações académicas.


Cambridge, University of Cambridge

About the Authors

Alexandra den Heijer

Alexandra den Heijer, MSc, PhD is associate professor (chair Real Estate Management) at the Faculty of Architecture, Delft University of Technology (TU Delft). She has a background in Architecture (BSc) and Management (MSc). Her specialisation is planning, design and management of university campuses and buildings. She focuses on generating management information for real estate decisions. In the past decade she has developed models and theories that help universities to design and implement their campus strategies and that contribute to creating knowledge cities. All Dutch universities have supported her research from the start.

Apart from the Dutch situation she has explored international references and has written many reports, articles and papers on the university and campus of the future, trends and changing concepts and campus strategies. After the fire that destroyed the building of the Faculty of Architecture in 2008 – including Alexandra's workplace – she could put her theories to the test as member of the team that created a new home ("BK city") for students and staff in a cultural heritage building, in an extremely tight time frame. Alexandra operates in an extensive network of national and international campus management experts – both in academia and in practice.

George Tzovlas

George Tzovlas, MSc is working as a PhD researcher at the Faculty of Architecture, Delft University of Technology. He has a background in Architecture (300 ECTS diploma from Aristotle University of Thessaloniki) and Management (MSc at TU Delft). With his Master thesis "Strategic Management of University Real Estate supported by BIM (Building Information Modeling)" he received an honourable mention. Since 2008, he has focused on higher education buildings and since two years on the analysis of management information regarding universities and their real estate.

For his PhD research (since 2014) he shifted his attention to (managing) the European campus. In the first phase of his research he collected data of more than 800 European universities. That database is the foundation of this book. In the next phase he will explore campus management (organisations) in European countries and will concentrate on developing a campus stress test, as introduced in this book.

About the TU Delft campus research team

The authors Alexandra den Heijer and George Tzovlas are members of a campus research team at Delft University of Technology (TU Delft), Faculty of Architecture and the Built Environment (A+BE), department of Real Estate & Housing (RE&H).

Campus team members and their projects:

- Alexandra den Heijer + George Tzovlas: Managing the European campus
- Flavia Curvelo Magdaniel: Technology Campuses in Cities (PhD thesis)
- Salomé Bentinck: Knowledge workplaces
- Naif Alghamdi: Sustainable campuses in Saudi Arabia (PhD thesis)

More about these projects can be found at: www.managingtheuniversitycampus.nl (pages campus research team and publications).

photo: TU Delft's campus research team
(from left to right) Flavia Curvelo Magdaniel, Alexandra den Heijer, George Tzovlas, Salome Bentinck and Naif Alghamdi

The quality of European universities and their campuses not only affects policy agendas of education, research and innovation: It also affects Europe's position in the global competition for the best students and professors. While many European universities have heritage and inner-city locations, highlighting the culture and history of Europe, they are also dealing with dysfunctional and energy-inefficient buildings that need reinvestment. The collective campus decisions they make influence no less than the competitive advantage, productivity, profitability and sustainable development of Europe itself.This book aims at supporting decision makers by providing examples from 28 European Union member states and drawing conclusions from their campus data.It contains a vision of the European campus of the future and guidelines for 'smart campus' strategies.

TU Delft Delft University of Technology