

Prof. Sabine Busching

> Gebäudetechnik <

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➔ WERDEGANG

➔ TEAM

➔ LEHRE

➔ HOCHSCHULPROJEKTE

- ➔ 1. Realisierungsprojekte
- ➔ 2. Gründung Forschungsgruppe REAP
- ➔ 3. Ausgründung ZEBAU GmbH

➔ WISSENSCHAFTLICHE BEITRÄGE

WERDEGANG

1979	Diplom Architektur an der Technischen Universität Carolo-Wilhelmina zu Braunschweig
1977-1982	1977-1982 Projektleitung im Planungsbüro Schroeder, Braunschweig
1982-1989	Selbständige Planungstätigkeit und Mitgründung des „Energie- und Umweltladen Braunschweig“
1989-1993	Wissenschaftliche Mitarbeiterin am Institut Technischer Ausbau (ITA) im Fachbereich Architektur der TU Braunschweig, Prof. Dr. B. Gockell
1994-1996	Projektleitung und Initialberatung in der Forschungsgesellschaft für umweltschonende Energieumwandlung und -nutzung mbH Kiel (FoGe)
1996	Forschungsaufenthalt am Lawrence Berkeley National Laboratory (LBNL), Environmental Energy Technologies Division, University of California, Berkeley
1996	Berufung zur Professorin an die künstlerisch-wissenschaftliche Hochschule für bildende Künste Hamburg (HFBK); Übernahme des Fachbereichs Gebäudetechnik im Fachbereich Architektur
2000	Mitgründerin und geschäftsführende Gesellschafterin der Hochschultransfereinrichtung ZEBAU GmbH (Zentrum für Energie, Bauen, Architektur und Umwelt)
ab 2006	Zum 01.01.2006 Integration des Fachbereichs Architektur der HFBK Hamburg in die von der Freien und Hansestadt Hamburg neu gegründete HafenCity Universität Hamburg (HCU)
2014	Eintritt in den Ruhestand; weiterhin Angehörige der HCU Hamburg

TEAM 1997-2007



Assistent*innen und Tutor*innen (chronologisch)

Dipl.-Ing. Judith Häring

Dipl.-Ing. Nina Behjati

Dipl.-Ing. Volker Grabs

Dipl.-Ing. Julia Gottwald MSc

Dipl.-Ing. Inka Kersting

Dipl.-Ing. Architektin Simona Weisleder

Dipl.-Ing. Swantje Wichern

Dipl.-Ing. Katrin Falck

Dipl.-Ing. Anja Riese

Dipl.-Ing. Nane Maier

Dipl.-Ing. Jan Gerbitz

Dipl.-Ing. Arne Piel

Dipl.-Ing. Frauke Meyer-Speulda

LEHRE



Lehrinhalte und Lehransätze des Fachgebiets Gebäudetechnik

Gebäudetechnik umfasst die Gesamtheit aller technischen Einrichtungen und ihre technisch optimierte Integration in das Gesamtkonzept eines Gebäudes. Sie beeinflusst entscheidend die Nutzbarkeit, den Komfort und die Umweltverträglichkeit eines Gebäudes. Gebäudetechnik ist als integraler Bestandteil des Architekturentwurfs zu verstehen.

Eine enzyklopädisch angelegte Ausbildung ist weder leistbar noch sinnvoll. Ein gesunder technischer Sachverstand soll mit Unterstützung exemplarischer Lehrprojekte geschult werden.

Lernziele:

- Sensibilisierung für das Konfliktpotenzial zwischen Komfortanspruch, Umweltbelastung, architektonischen und urbanen Qualitäten
- Befähigung zur fachlich-kritischen Bewertung neuer technischer bzw. technologischer Entwicklungen
- Vertiefte Kenntnis zu aktuellen innovativen Technologien, Stand der Forschung und Entwicklung
- Erkennen von technisch seriösen gebauten Beispielen, Best Practice

HOCHSCHULPROJEKTE

Neben regelmäßigen Exkursionen zu Best-Practice-Beispielen und werden im Lehr- und Forschungsgebiet Gebäudetechnik Realisierungsprojekte entwickelt, in denen interdisziplinäre, anwendungsorientierte und experimentelle Ansätze verfolgt werden. Dabei steht der Anspruch der Integration innovativer Technologien in eine anspruchsvolle Architektur gleichbedeutend neben der Entwicklung neuer transdisziplinärer Arbeitsweisen. Damit wird die Bildung hochschulinterner Kooperationen und ein strukturierter hochschulübergreifender Kompetenzaustausch ermöglicht. Gleichbedeutend wird durch projektbezogene Partnerschaften mit der Wirtschaft der Dialog zwischen Planungs- und Baupraxis mit der Hochschule verstärkt.

1. Realisierungsprojekte (einige Beispiele):



10kW PV-Anlage Averhoffstraße

Realisierungsprojekt eines Solarseminars
an der HFBK Hamburg

Projektpartner (u.a.):

Fa. GEOSOLAR

HEW AG

1997-1999



Container P1

Sanierungsprojekt im Lehrbereich
>Künstlerische Lehre und Werkstatt<

Projektpartner: Prof. Dr. M. Staffa,
Dorothee Daphi, Mehmet Dogu

Mitarbeit: Simona Weisleder, Malcom J.
Langham, Katrin Falck, Swantje Wichern

1999 - 2000



Sonnenfalle

Realisierungswettbewerb

1. Platz: Matthias Rieper, Thomas Händle,
Johannes Niemeyer

Projektpartner Tragwerk: Prof. Dr. M. Staffa

Mitarbeit bei der Realisierung:

Simona Weisleder (PL), Katrin Falck, Anja
Riese

1999 - 2002



underground averhoff

3-Röhren-Bunker

Künstlerisch-wissenschaftliches
Forschungsprojekt

Projektpartnerin: Prof. Dr. Simone Hain

Mitarbeit: Simona Weisleder (PL), Frauke
Meyer-Speulda

2002 - 2004



SummerSchool

>Sustainable Urban Planning and
Architecture in Growing Cities<

Partner: Tongji University Shanghai,
Prof. Yiru Huang, Prof. Siegfried Wu

SoSe 2005 in Hamburg
SoSe 2006 in Shanghai

2005 - 2006

2. Gründung Forschungsgruppe REAP:

Bereits in der Gründungsphase der HCU haben sich einige Kolleg*innen zusammengeschlossen, um eine interdisziplinäre Forschungsgruppe zu initialisieren: Prof. Peter Braun, Prof. Sabine Busching, Prof. Dr. Wolfgang Dickhaut, Prof. Dr. Udo Dietrich, Prof. Dr. Reza Khorasani, Prof. Heike Langenbach, Prof. Dr. Irene Peters, Prof. Dr. Uwe Stephenson, Prof. Dr. Harald Sternberg, Prof. Dr. habil. Wolfgang Willkomm, Prof. Dr. Jens Zipelius.

Inzwischen hat die REAP Gruppe ein umfangreiches Programm in Forschung und Lehre im Bereich der ressourceneffizienten Technologien und des Managements im Gebäudebau und im Bereich der Stadtplanungstechnik entwickelt.

Aus dem REAP-Programm:

The REAP Group Resource Efficiency in Architecture and Planning (REAP) aims to advance research and teaching in resource efficient building and in urban services technologies as well management and planning practices. Its primary focus is on promoting the diffusion of existing technology, bringing it "from the shelf into the world". This involves integrating novel environmental technologies and management strategies into architectural and urban design as well as understanding and addressing barriers of implementation. The REAP Group represents a broad range of academic disciplines including: Architecture, Civil and Construction Engineering, Geomatics, Physics, Law and Economics, Urban and Infrastructure Planning. Most of its members have worked abroad for several years. The Group maintains a variety of international contacts.

Aktuelle Infos unter:

<https://www.hcu-hamburg.de/research/forschungsgruppen/reap/>



Klimzug-Nord
Strategic concept for adaptation to climate change in the metropolitan region of Hamburg
One of the new projects of 2010 is the regional based project "Klimzug Nord" funded by the Federal Ministry of Education and Research (BMBWF) in runs for two years until March 2014. Three institutions of the REAP Group are involved in this project. Within the project there will be developed Concepts for technologies and methods to minimize the consequences of climate change. Another mission is to help the population and the economy to adapt to the higher risks caused by climate change. The pilot goal focus is on three main topics: Urban Heat Management, Integrated Urban Development and Sustainable Calibrated Investments. REAP is engaged within the topic "Integrated Urban Development" with the following projects:
The project "Domestic Management" analyzes how existing method of domestic management can be adapted to climate change, particularly regarding 100 year storm events and dry spells. These methods will be integrated into different structure of urban development also with respect to nature conservation.
The project "Positive Air Conditioning Administration Building" deals with positive climate control of administration buildings. Subjects are existing buildings as well as new planned buildings concerning the heating and laser-dimmed adaptation by passive air conditioning. It focuses on the user's control and to reduce the energy consumption.
Prof. Dr. Udo Dietrich and Julia Ay
Project: Regulation Items of Regulation of Climate Adaptation Governance* aims to evaluate national and international legal standards for climate adaptation, legal provisions and instruments, and combined with a focus on the potential laws might offer to allow a more flexible response to the possibilities concerning in different climate change scenarios.
Prof. Dr. Wilfried Noll and Margarete
For further information please visit: <http://www.klimzug-nord.de>

HalleCity University Hamburg
HalleCity University (HCU) Hamburg is dedicated to the urban built environment and metropolitan development in its physical, ecological, socio-economic and aesthetic dimensions. This new university was founded by the Free and Hanseatic City of Hamburg in January 2006. It was formed out of three former academic institutions (HAW, HfB and HfB II) in Hamburg to address the current and future needs for top talents and elites. Today our profession is based on the disciplines of the HCU, which cover the spectrum from building to city and comprises the subject areas: Architecture, Civil Engineering, Geomatics and Urban Planning. Within and across these disciplines a large number of different approaches to research, teaching and practice as they concern the urban environment.

Contact REAP Group
HalleCity University (HCU) Hamburg
Resource Efficiency in Architecture and Planning (REAP) Group
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www.hcu-hamburg.de/research/forschungsgruppen/reap/



SAWA
Strategic concept for integrated Water management Actions
Another project concerning water management is the EU project "SAWA" (The Science of Water) funded by the European Union Regional Development Fund (ERDF) and running since December 2008 with duration of four years. Lead by the Landbouwkilop, Vastgoed, Bouw and Groenruimte Agency for Roads, Bridges and Water, Hamburg 22 partner institutions from Germany, The Netherlands, Norway, Scotland and Sweden are facilitating the implementation of the Decision on the Assessment and the Management of Flood Risk.
The international partner institutions strive for a transdisciplinary approach to the implementation stage. This implementation stage focuses on the development of water management systems to the effects of extreme flood events and to accommodate them with the integrated urban water management of the Water Framework Directive.
The REAP Group investigates the potential of vegetative measures that help reduce flood risks and achieve a good ecological status in the catchment of the river Wulstsee. These measures refer to storm water management and optimizing the use of retention capacities in and along the watercourses.
Responsible: Prof. Dr. Wolfgang Dickhaut and Ines Ims



SWITCH
Water Management for Tomorrow's Cities' Health
The EU-funded project started in February 2006 and will end in January 2011. It belongs to the 6th Framework Program (FP6). Integrated Projects (Global Change and Eco Systems, Global Health) and is funded by the UNESCO. The overall objective is to enhance a sustainable handling of water in urban areas. There are two main tasks that are at the core of the project. The first one is the development of a manual for water sensitive urban design (WSUD) best practice principles are developed especially with respect to storm water management. The methodological approach to summarize the analysis of case studies that could possibly support those principles.
The second task is the implementation of a so-called Learning Alliance. The latter is an institutionalized group of stakeholders that comes together to discuss the possibilities of an integrated approach to urban water management strategies for Hamburg. Within the project for the year 2008 in this case the developed strategies focus on the question of the future use of urban water resources. The aim is to integrate separate parts of water bodies regarding their future uses in terms of conventional and non-conventional purposes. The Learning Alliance is one of the key elements within the SWITCH project.
Responsible: Prof. Dr. Wolfgang Dickhaut, Jacqueline Hoy and Ines Ims



Resource Efficiency in Architecture and Planning
Interdisciplinary Research and Innovation



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www.hcu-hamburg.de/research/forschungsgruppen/reap/



Use Efficiency
Universities and Students for Energy Efficiency International Training
This international project started in June 2009 and is one example for the concept of "Research Integrated Teaching" where students are involved into research activities during their studies. It is funded within the Intelligent Energy Europe (IEE) Program of the EU and will run for three years. It is coordinated by the University of Twente, The Netherlands and involves nine universities from different EU countries as well as four technological market players. The project aims to increase how low energy efficient systems in university buildings through the application of the Energy Performance in Buildings Directive (EPBD). The goal is that universities and the people that educate them, students and staff, develop into model examples for both technical solutions and energy efficient behaviors. The innovation aspect of the project is that it involves students as the main actors in the project implementation. This involves design as well as working and learning together with researchers, teachers, architectural staff. This provides a high leverage as today's students are tomorrow's politicians, economic and public opinion.
Responsible: Prof. Dr. Udo Dietrich and Sergio Schönbach
For further information please visit: <http://www.usefficiency.eu>

Primero
Simulation program for primary energy demand
The project "Primero" is a new research for applied research embedded in the REAP Group. It was funded by the Free and Hanseatic City of Hamburg (Umweltbundesamt, Umweltbundesamt, Stadt, die Hamburger WEG). The team includes a variety of German partners. The project aims to identify heating and cooling strategies that integrate the demand and supply side in its regional context. The team develops a tool to map heat demand and supply in a geographical information system, allowing to integrate the demand and supply side in its regional context. This is a cooperation with the Digital City team from the University of Hamburg (UHH) and HCU.
Responsible: Prof. Dr. Udo Dietrich

Sustainability and the Built Environment
Resource efficiency in the built environment is crucial for the sustainable development of our cities. Construction, renovation, operation and demolition of buildings and technical infrastructure make up the largest share of European and global energy and material consumption. Moreover, increasing water efficiency in the building sector is crucial to prevent some of the worst possible water resources. The built environment presents tremendous opportunities for conservation and efficiency improvements and is the "low hanging fruit" in any effort to foster resource efficiency. The challenge is to implement what is already out there, adding the building code and construction habits, risk assessment and the completion of construction.



QBPT
Development of efficient algorithms for the simulation of sound diffusion based on the method of Quasi-Periodic Beam Tracing
Noise is one of the most underestimated environmental effects. QBPT (Quasi-Periodic Beam Tracing) is a novel and versatile tool for noise prediction, mainly due to the fact that multiple reflections and diffractions appearing with sound propagation in both air and water cause the complex scattering. QBPT is a fundamental research project which is supported by the German Research Association (DFG). It started in February 2009 and will run for three years. The aim of this project is to find a new method for the simulation of sound propagation. Currently both room acoustics and water simulation propagate City acoustics in ray-tracing algorithms are widely used and have proven to be efficient. The crucial point is that computation time increases if the number of diffraction or scattering is applied. A new algorithm is being developed to solve the problem as discussed by Prof. Dr. Udo Dietrich. The idea is to make a modification of the solid angle of the beam-tracing algorithm. Additionally, a method of beam selection based on the uncertainty relation has been developed, which seems to be generalizable.
Responsible: Prof. Dr. Udo Dietrich and Alexander Pohl



EnEff City
Energy Efficient City Competitions, the Hamburg Way
The project "EnEff City" is funded by the German Research Association (DFG) and is coordinated by the City of Hamburg (Umweltbundesamt, Umweltbundesamt, Stadt, die Hamburger WEG). The team includes a variety of German partners. The project aims to identify heating and cooling strategies that integrate the demand and supply side in its regional context. The team develops a tool to map heat demand and supply in a geographical information system, allowing to integrate the demand and supply side in its regional context. This is a cooperation with the Digital City team from the University of Hamburg (UHH) and HCU.
Responsible: Prof. Dr. Udo Dietrich



Research Integrated Teaching
Development of efficient algorithms for the simulation of sound diffusion based on the method of Quasi-Periodic Beam Tracing
Noise is one of the most underestimated environmental effects. QBPT (Quasi-Periodic Beam Tracing) is a novel and versatile tool for noise prediction, mainly due to the fact that multiple reflections and diffractions appearing with sound propagation in both air and water cause the complex scattering. QBPT is a fundamental research project which is supported by the German Research Association (DFG). It started in February 2009 and will run for three years. The aim of this project is to find a new method for the simulation of sound propagation. Currently both room acoustics and water simulation propagate City acoustics in ray-tracing algorithms are widely used and have proven to be efficient. The crucial point is that computation time increases if the number of diffraction or scattering is applied. A new algorithm is being developed to solve the problem as discussed by Prof. Dr. Udo Dietrich. The idea is to make a modification of the solid angle of the beam-tracing algorithm. Additionally, a method of beam selection based on the uncertainty relation has been developed, which seems to be generalizable.
Responsible: Prof. Dr. Udo Dietrich and Alexander Pohl



Teaching at HCU Hamburg
After two years of preparation the REAP Master Program started in Winter Semester 2009/2010. Now it already brought together students from the continents, Erasmus and Erasmus are already involved in a variety of projects, which is supported and contributing to the research activities of the REAP Group. The project based work allows students to research and experience in applied practice. They learn to design and plan concepts in the context of real or potential real problems.

Reports and Studies of REAP
The completion of reports and studies is part of the research activities of the REAP Group. They often concern the topic "Energy Efficiency" and include the collection and documentation of data as well as the analysis of completed projects, which are needed for further research.
In 2010 members of the REAP Group were working on several reports and studies such as "Planning Energy Efficiency in the Hamburg Quarter of Altona" and "Measuring Energy Efficiency in Residential Buildings for energy efficiency of Urban Areas" and "Implementation of a wind based passive air conditioning method on the new 'U' building". Prof. Dr. Udo Dietrich

3. Ausgründung ZEBAU GmbH:



Die ZEBAU - Zentrum für Energie, Bauen, Architektur und Umwelt GmbH, wurde im September 2000 von Prof. Peter O. Braun, Hochschule für angewandte Wissenschaften Hamburg, Prof. Sabine Busching, Hochschule für bildende Künste Hamburg und Prof. Dr.-Ing. Gerhard Schmitz, Technische Universität Hamburg-Harburg unter Beteiligung ihrer jeweiligen Hochschule gegründet. Administrativ unterstützt wurde diese Neugründung von der BWF, der Umweltbehörde und der HEW AG. Zwischenzeitlich wurden die Gesellschafteranteile der HFBK von der HCU übernommen.

Die ZEBAU GmbH steht als unabhängige Netzwerkstelle in Norddeutschland für

- gebündeltes Wissen rund um Energieeffizienz und erneuerbare Energien im Bauen
- interdisziplinäres Denken und Handeln für angewandten Klimaschutz im Bauen und in der Stadtentwicklung
- Initiierung und Koordination von nationalen und internationalen Kooperationsprojekten und Bauausstellungen
- kompetente Projektbegleitung vom Konzept bis zur Umsetzung
- qualifizierte Fortbildungsprogramme und Fachveranstaltungen.



Aktuelle Entwicklungen und Projekte des Unternehmens sind zu finden unter:

www.zebau.de

WISSENSCHAFTLICHE BEITRÄGE

Forschungsgesellschaft für umweltschonende Energieumwandlung und -nutzung mbH (FoGe Kiel)

- 1994: Messreihen Energieverbrauch des bundesweiten Pilotverhabens Niedrigenergiehäuser
- 1995: Entwicklung und Evaluation von Förderprogrammen des Landes Schleswig-Holstein
- 1996: Interdisziplinäre ingenieurs- und sozialwissenschaftliche Untersuchung zur „kontrollierten Wohnungslüftung“

Berkeley

- 1996: Indicators of Energy Performance in Cold Climate Homes, IEA-Verbundprojekt

Mitwirkung in Fachorganisationen

- 1997-2002: Beiratsmitglied im NFFG (Niedersächsischer Forschungsverbund für Frauen-/ Geschlechterforschung in Naturwissenschaft, Technik und Medizin), Hannover
- Mitglied im Wissenschaftlichen Fachbeirat >Netzwerk Innovative Dämmstoffe<, Kiel

Modellvorhaben transmedien

- 2002-2004: >transmedien<; Modellversuch im Rahmen des Bund-Länder-Fachprogramms „Kulturelle Bildung im Medienzeitalter“; gemeinsam mit Prof. Helke Sander; wissenschaftlich-künstlerische Projektleitung: Ute Vorkoeper

EU-Projekt

- 2005-2007: >Castles of Tomorrow<; Konzepte zur nachhaltigen Sanierung von Herrenhäusern im Ostseeraum; EU INTERREG IIIB gemeinsam mit TuTech Innovation GmbH; Riga-Hamburg