

# Sustainable by Design 3 Credits



**Lecturer: Mikael Koch**

**Course Assistant: Justin Shea**

Typical meeting location: Vester 10-A23, unless noted otherwise.

The scope of this lecture course is to communicate knowledge of sustainable practices, seen from a Danish perspective.

Since there is a Danish tradition for architects to work in several scales, planning, architecture and industrial design, we will investigate the potential in having a sustainable focus on all scales.

Furthermore the scope is to enable the student to grasp the main aspects of sustainability as parameters for creating good architecture and industrial design, in all contexts.

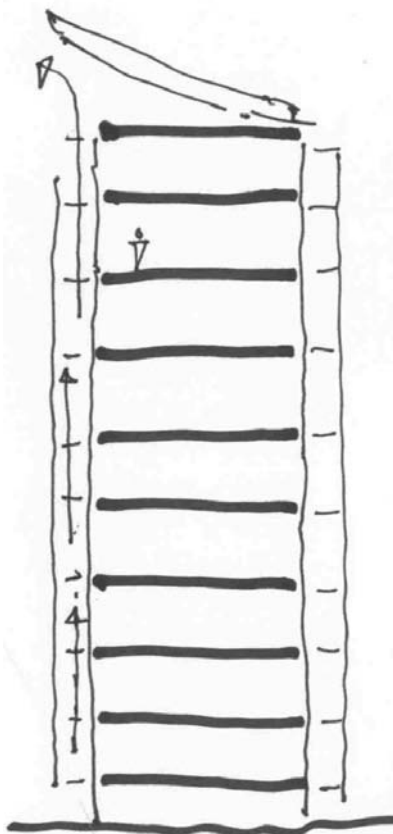
The definition of sustainability deals with the present conditions of a given location - culturally, climatically, and societal - and the ecological and technical conditions as well. Also sustainability deals with economy, but focus will be put upon social and technical aspects - coherence between design practice/ technology and process.

The conditions and potentials for a given project, derived from a specific context will be analyzed, with regards to the design of the project – wind, sun, ventilation, indoor climate, comfort, choice of materials, use of materials, durability and resources.

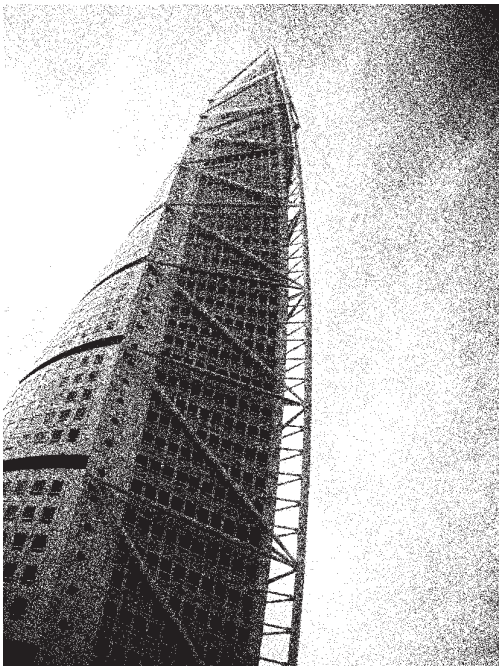
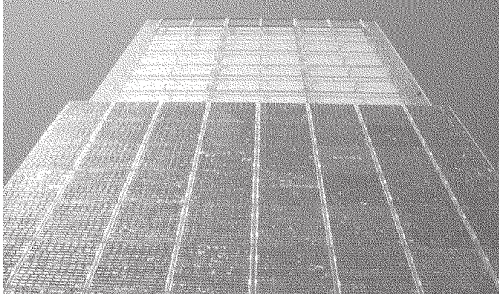
As a perspective, beyond this class, the aim is to prepare the students to participate in cross disciplinary design teams and develop working methods to handle complex problems and challenges, technical as well as aesthetic and combine these in esthetical successful, durable and thereby sustainable design.

Also the course will deal with societal conditions for the process of creating design – ideologies, politics and societal prioritizing.

All days classes are from 9:15 - 12:00. Each day will consist of lectures with visual presentations, discussions in groups and plenum, and conclusions.



## Sustainable by Design, continued



Guest lecturers will contribute during the course.

Besides the lecture course as such following aspects will be covered:

- Sustainable aspects in design and architecture
- Sustainable projects, field trip, October 1st
- Sustainable building project in Western Denmark - precedents

Required readings are supposed to have been read ahead of lectures and are meant as a parallel supplement of knowledge to the subjects covered during classes.

More suggestions to readings may appear during the course

### Evaluation

Participation in lectures and discussions	15%
Quizzes and mini assignments (equally weighted)	20%
Case Study Outline	15%
Case Study	50 %.

Students will submit a Case Study paper. The critique will be of buildings or design projects discussed during the course and buildings/projects visited during the semester.

- The paper should be limited to ten A4 sheets, including illustrations
- The following elements must be covered: brief factual information, context, description of strategies implemented in the project, personal interpretation of the pros and cons of strategies, seen in the perspective of architectural or design quality.

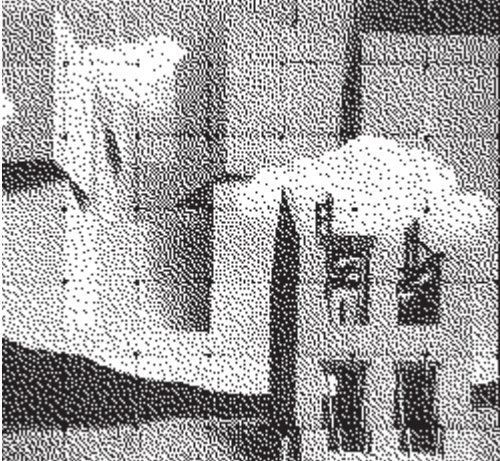
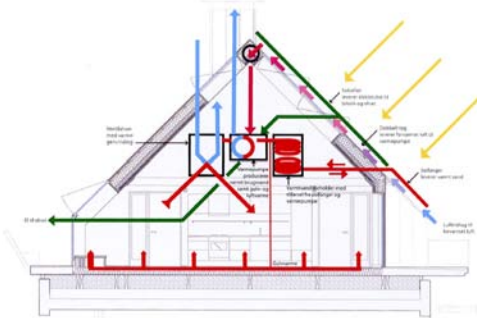
The paper will be graded as part of the Sustainable by Design. Papers will not be returned in hard copies after the course.

## Sustainable by Design, continued

date	session	time	topic
Th Aug 30	1	09:15 - 12:00	<p><b>Intro to Sustainable Design</b></p> <p>What is Sustainable Design? How does it impact our society? What does it require of a designer? Professional skills needed to successfully apply sustainability in the Architecture industry.</p> <p>Required Preparation: SbD Assignment 1: A typed paper stating your name, home state, your region/state climate. Major industry/source of income for region/state. Your professional ambition, challenges you face in this pursuit, expectations of this course. To be presented in class and handed in.</p> <p><b>Class Rep Elections</b></p> <p>Required reading: "Sustainability is a cultural problem" – Wilfred Wang, <i>Harvard Design Magazine</i>, Spring/summer 2003, no 18. (Binder #2) "From cradle to cradle" - Michael McDonough, William &amp; Braungart, pp. 3-16. (Binder #14) Al Gore's book (on reserve in DIS library)</p>
			
Sa Sep 1		10:00 - 12:00	<p><b>Vernacular buildings</b></p> <p>Lec: Jørgen Peder Hansen The difference between vernacular and contemporary buildings examples of Danish Vernacular.</p>
Su Sept 2		12:00 - 17:00	<p><b>Field study to the Open Air Museum.</b></p> <p>Leaders: TM, PGP, BC, MK Meet at main entrance at Kongevejen 100, Sorgenfri. Come to AD office after this trip for reimbursement of travel expense.</p>
We Sep 5		16:15 - 18:00	<p><b>History of Copenhagen.</b></p> <p>Lec: Jørgen Peder Hansen How Copenhagen developed from a village through a medieval town and to the industrial expansion in the late 19th Century.</p>
Th Sept 6	2	9:15-12:00	<p><b>Success Models / Planning</b></p> <p>When is a project successful? The need for planning and the basis for incorporating sustainability. Follow up on open air field study, what can we learn from these buildings built from local materials and refined over time?</p> <p>Required reading: "Ecological building – or just environmentally sound planning?" – Ole Michael Jensen, <i>Arkitektur DK</i> 7/1994, p. 353-367. (Binder #7) "Five Reasons to Adopt Environmental Design" - Susanna Hagan <i>Harvard Design Magazine</i>, Spring/summer 2003, no 18. (Binder #9) "Solar Energy in Architecture and Urban Planning" - Thomas Herzog, <i>New York: Prestel Verlag</i>, 1996. Pp. 20-45. (Binder #34)</p>
Th Sept 6		16:15 -18:00	<p><b>History of Danish housing</b></p> <p>Lecturer: JPH The development of Danish housing from the crowded areas of late 19th Century to the industrialized suburban high-rise areas of the 1960's.</p>

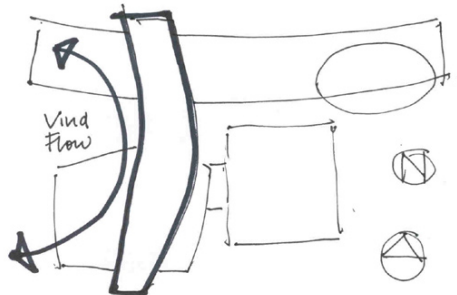


## Sustainable by Design, continued

date	session	time	topic
Mo Sept. 10	3	09:15 - 12:00	<b>Renarch Sustainable Buildings</b> guest lecturer: Lena McNair Over view of different principles used for sustainable buildings. Introduction to assignment 2 :(Min 3 slides max 5) 1 "The most sustainable building" 2 "The most interesting detail", 3 "What wondered or puzzled me most" Slides should be placed in context to sustainable principles mentioned in SbD 3. To be done on WDK study tour. Short Introduction to Case Study. List of potential case studies available.  Required reading: "Renarch" Lena Larsen/Peter Sørensen Kunstakademiets Arkitektskole "A Green Vitruvius – principles and practice of sustainable architecture". ACE Architects' Council of Europe. London: James & James, 1999. (Binder #10, #13, #37)
			
Mo Sep 10		16:15 - 18:00	<b>Intro to Danish Architecture</b> Lecturer: ML Preparation lecture for study tour to Western Denmark
Location: Annex A			
<i>Study tour to Western Denmark Sept 13 - 15</i>			
Mo Sep 17		09:00	<b>Hand in Assignment 2 to AD office</b>
Mo Sep 17		09:00 -17:00	<b>Field study to low-rise/high-density housing areas.</b> Leaders: CN, BC Meet at Frue Plads - Bring your own lunch
Th Sept. 20	4	09:15 - 12:00	<b>Ideological projects</b> The ideal house in regional/climate context. The mass produced house - system delivery. Product design. Follow up on the Renach presentation. Follow up on Study Tour to Western Denmark Presentation of student assignment 2. slides. (min 3, max 5 slides) Hand in SbD Assinmment 3 What is sustainable design? In a broad perspective, in several scales and from a holistic viewpoint? One page maximum. Conclude and Formulate your statement/
			
Required reading: "A Green Vitruvius – principles and practice of sustainable architecture". ACE Architects' Council of Europe. London: James & James, 1999. , (Binder #23, #29 and #33) "Sun, Wind and Light." G.Z. Brown and Mark DeKay. USA. John Wiley and Sons, Inc. 2001. (Binder #15, #17, and #19)			
Th Sep 20		16:15 -18:00	<b>Contemporary Danish housing</b> Lecturer: JPH Danish housing since the 1960's: reactions against high-rises, low-rise/high-density, the social dimension, Co-housing.
Location: Vester 10 - A12			
Only students not taking			
20th Century Danish Architecture			

## Sustainable by Design, continued

date	session	time	topic
Th Sept. 27	5	09:15 - 12:00	<b>Minimizing consumption of materials, in product design</b>



**Minimizing consumption of materials, in product design**  
Affect on product, function, aesthetics, and price. Optimizing tooling, recycling, and transportation.  
Discussion on sustainability based on assignment 3.  
Case 1: Small in Scale - Large in Quantity  
Case 2: Service concept for the farming industry, with an environmental gain.

**Case study outline to be handed in at beginning of class**

Required reading:

*"A Green Vitruvius – principles and practice of sustainable architecture". ACE Architects' Council of Europe. London: James & James, 1999. Pp. 47 - 60. (Binder #37)*

*"Green World, Gray Heart. Robert France. Harvard Design Magazine. Spring/Summer 2003. number 18. Pp. 1 - 7. (Binder #24)*

Mo Oct. 1		09:00 - 17:00	<b>Field Study to sustainable industries and buildings</b>
-----------	--	---------------	--

Meet at Frue Plads - Bring your own lunch

Th Oct. 4	6	09:15 - 12:00	<b>Consultation on Outline for Case Study</b>
-----------	---	---------------	---

**Consultation on Outline for Case Study**

In groups of approx 5 person, if same case is chosen, join same  
Introduction to assignment 4 (Min 4 slides max 5)

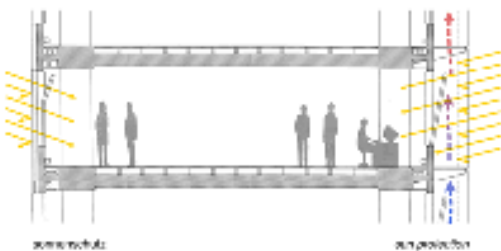
1" The most sustainable building" in your opinion

2 "The most interesting detail

3" What wondered or puzzled me most

4, Slide with Section Drawings of a sustainable building detail/part/  
principle.(façade, roof, or floor, light or heavy constructions)

All slides should be placed in context to sustainable principles  
mentioned in SbD 3.



Required reading:

*"Sustainable City of Tomorrow – Bo01 – Experiences of a Swedish housing exposition" FORMAS, Stockholm, 2005. Pp. 41-55 & 73-77 & 119-123. (Binder #16)*

*"BOASE – the future Home" - Claus Bech-Danielsen, et. al. Copenhagen: Statens Byggeforskningsinstitut & Kunstakademiets Arkitektsskole, 2001. Pp. 9-78: Boase / Troya / The Vertical city. (Binder #21)*

Mo Oct 8		9:15 - 12:00	<b>Intro: Sweden/Finland and Germany/The Netherlands study tours</b>
----------	--	--------------	--

Location: Annex A

**Intro: Sweden/Finland and Germany/The Netherlands study tours**

Lecturer: ML

Preparation lecture for study tours

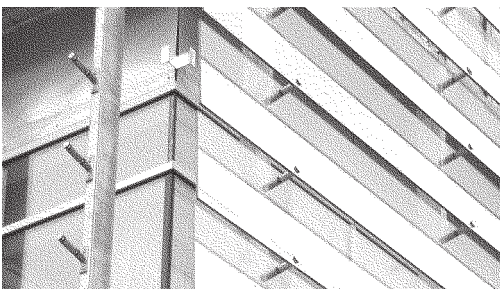
*Study tour to Sweden / Finland Oct. 13 - 20 or Germany / Netherlands Oct. 13 - 19 or Oct. 14 - 20*  
*Independent study and travel Oct. 21 - Nov. 4*

Mo Nov.5		9:00	<b>Hand In SbD assignment 4 at AD office.</b>
----------	--	------	---

9:00

**Hand In SbD assignment 4 at AD office.**

## Sustainable by Design, continued

date	session	time	topic
Th Nov. 8	7	09:15 - 12:00	<p><b>Presentation, discussion and evaluation of assignment 4</b> Building techniques and details</p> <p>Required reading:  <i>"Compact Living" In: Claus Bech-Danielsen, et. al. "BOASE – the future Home" Thorkil Kjærsgaard, Copenhagen: Statens Byggeforskningsinstitut &amp; Kunstakademiets Arkitektsskole, 2001. Pp. 137-148. (Binder #43)</i>  <i>"Bo01 – Byggnaderna – Planen – Processen – Hållbarheten" - Eva Dalman, Stockholm: AB Svensk Byggtjänst, 2001. Pp. 42-43 (Binder #26)</i>  <i>"Contemporary Urban Planning" - Martin Biewenga, in "Boase - the future home", Copenhagen, 2001 pp. 211-218. (Binder #27)</i></p>
Mo Nov 12		9:00 - 18:00	<p><b>Field study to Copenhagen north</b> Leaders: SA, BC, JHJ Meet at Frue Plads - Bring your own lunch</p>
Th Nov. 15	8	9:15 – 12:00	<p><b>How can industrialized building processes contribute to sustainability?</b> guest lecturer: Anne Biem from Cinak (Center for Industrial Architecture).</p> <p>Required reading:  <i>LCA "Construction material for a bridge with regard to the environment" (binder #30)</i></p>
Th Nov. 22	9	09:15 - 12:00	<p><b>A Development Case: A Building Component</b> Indoor climate and health aspects in relation to production, installation on site, and during daily use. Overall building maintenance. Linking product with after sales service.</p> <p>Required reading:  <i>Sun, Wind and Light." G.Z. Brown and Mark DeKay. USA. John Wiley and Sons, Inc. 2001. (Binder #22, #25, and #28)</i></p>
Th Nov. 29	10	09:15 - 12:00	<p><b>High Tech Solutions that lead to Sustainable solutions.</b> New technology, fusion/merging between entertainment, comfort, help and energy savings / optimization. Linking components in the Home. Taking leadership in projects, making new consortiums. Developing system delivery.</p> <p>Required Reading:  <i>"A Post-Apocalyptic View of Ecology and Design – thirteen recent books" - Richard Ingersol, Harvard Design Magazine, Spring/summer 2003, number 18, 5 pages. (Binder #40)</i></p>
			
Mo Dec. 5		09:00	<b>Final Paper Due</b>
Th Dec. 6	11	09:15 - 12:00	<p><b>Conclusion and Review</b></p> <p>Required Reading:  <i>"Cities for a Small Planet." Richard Roger and Philip Gumudchdjians. London: Faber and Faber. 1997. Pp. 146 - 175. (Binder #45)</i></p>