



# Design for Sustainability. Draft curriculum.

TEACHING DESIGN FOR SUSTAINABILITY.  
PROPOSED OUTLINE FOR UNDERGRADUATE VISUAL  
COMMUNICATION DESIGN PROGRAMS

\*(Living the way we are now, we will need the resources of 5 1/2  
planets to survive)

draft

*“It makes far better sense to reshape ourselves to a finite planet than to attempt to reshape the planet to fit our infinite wants”*

*David W. Orr*

draft

## Table of contents

Aims of the course .....	1
Overview of contents .....	2
Introduction to the introduction .....	3
Unit 1 Introduction to the problems .....	4
Unit 2 Introduction to Sustainability.....	5
Unit 3 Design for Sustainability I: the will to act.....	6
Unit 4 Design for Sustainability II: the issues of Sustainability. ....	7
Unit 5 Conceptual tools.....	8
Unit 6 DfS Case-studies.....	10
Class Materials .....	11
Reading sources .....	12
Online sources .....	14

draft

## Aims of the course

- Introducing the basis of Design for Sustainability (DfS) at the undergraduate level consistently, by providing the information and conceptual tools in a focussed curriculum, and by introducing Design for Sustainability concepts through project-based exercises. Developing critical thinking by promoting responsible practice of design concerning sustainable futures.
- Reinforcing the teaching of issues related to Sustainability –environmental, social and economic consequences, spread-out today among different courses and faculties, in one unified course based on a design perspective.
- Attending to and capitalizing on the rising interest of young students in global, environmental and social issues connected to their future design professions.
- Promoting Design for Sustainability as a part of a Social Science Route and turn this option into a more “applied science route”. Design as a social science is the natural route for teaching Sustainability from a holistic approach, taking advance of the increasing demand of Sustainability knowledge beyond technological education.
- Increasing connections between the Visual Communication Design program and the worldwide community of Design for Sustainability: experts, authors, instructors, lecturers, students, and their host institutions.
- Apply this curriculum as a pilot course with chances to be part of a visual communication design program in the future.
- Promoting the creation of a first DfS experience course at undergraduate level in high education.

draft

## Working on new paradigms

Increasing awareness of and providing extended information about sustainability and its close relation with design decisions is an important goal of this project. The goal of the Design for Sustainability course is, to give the conceptual framework, modify the mind-set and allow the students to get a broader sense of responsible practice. Students taking Design for Sustainability will reach a new view of traditional design issues and even of other fields rather than design. This means a better understanding of the complexity and interconnectivity that rule ecosystems and the basis of life function. The course stimulates critical thinking and addresses new paradigms of design, bringing retrospective and prospective analysis.

## Overview of contents

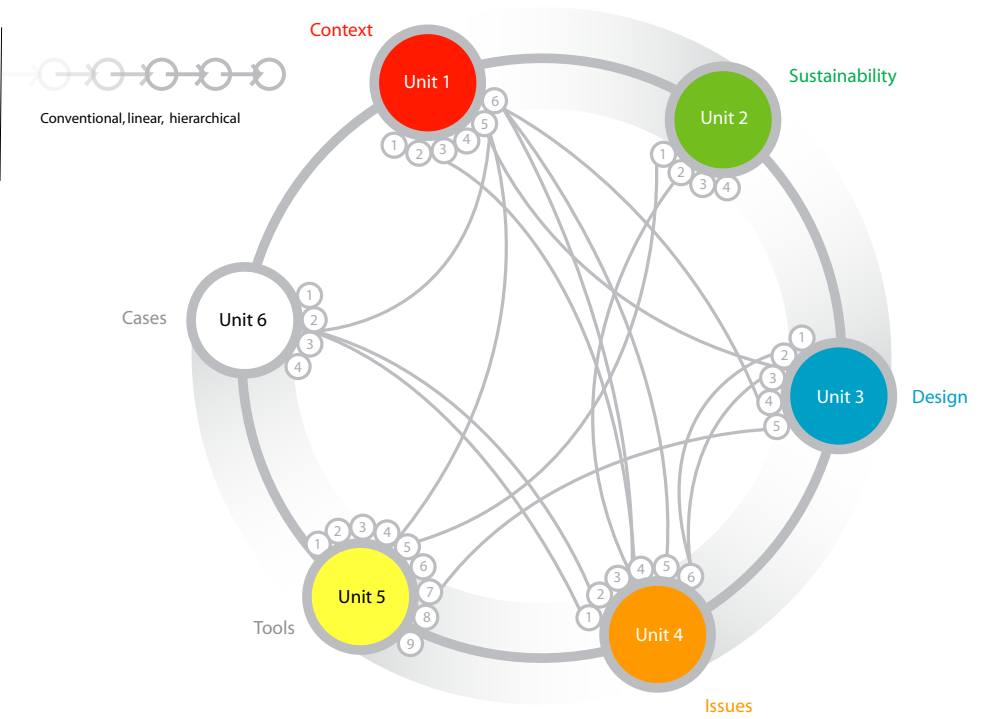
The course consists of a modular structure of six units:

- Introduction to the problems
- Introduction to Sustainability
- Design for Sustainability I: the will to act
- Design for Sustainability II: the issues
- Analysis of Conceptual Tools
- Analysis of Case-Studies

These six units are ordered in sequence, but shown as interconnected. Interconnecting units means developing issues in parallel across more than one unit at the time. Each unit contains a sequential core of topics to address the learning process gradually. The idea of a traditional curriculum sequence with a hierarchical order of topics allows: introduce and give context, increase complexity, and finally arrive at conclusions and encourage critical thinking. The idea of interconnectivity, inspired in Gestalt's apprehensiveness<sup>1</sup>, leads to a prior conception of the whole and adds balance to the process of achieving knowledge and understanding new concepts. Students can be overwhelmed by the complex nature of the problems addressed from the very beginning. According to the conclusions of the thesis research and testing results that precede and supports this draft curriculum, by connecting problems from early stages with case-studies and tools, the risk of discouraging students is reduced and the transition from understanding problems to finding solutions is optimized. The metaphor "going from linear to cycling" is present in the combination of both, hierarchical learning process and interconnected apprehensive process.

<sup>1</sup> Gestalt theory holds that the discrete elements of a whole are meaningful only in relation to the whole. This is to say that the whole is not explainable in terms of any possible enumeration and conjunction of its parts, but rather, we can only know what the elements of anything are elements of that thing by having a prior conception of the whole".

In the diagram is represented the interconnectivity between units and sub-units without missing the whole approach to the course content. Every connected node is directly linking exercises, lectures, readings, interrelated.



draft

“...we cannot build models...if we don't already possess an unequivocal will to realize... ”.

—Tomas Maldonado (1972)

### Preface to the introduction

We cannot work on Design for Sustainability if we do not already possess the will to act.

The following issues will be discussed in the class:

Skepticism, apathy, behavior, political will, and unconvenience among other human constraints.

Common misconceptions about the sustainability issues.

Scientific view and evidence.

Social sciences' argumentation and analysis of facts. Philosophy and the empirical approach to understand reality.

draft

## Unit 1

### Introduction to the problems:

*We have turned our world unsustainable, how did we get here?*

### Components:

Lecture | Handout | Readings | Debate

Summarize articles, book chapters and/or key-authors, and present it to the class (work in group)

Behavior change exercise

### Contents:

#### 1.1 History and socio-political context.

Brief exploration of the last two centuries of our civilization. Agriculture, industrialism and post-industrialism.

#### 1.2 The ancient sustainable world | Old nations and civilizations

A close observation of pre-agriculture and pre-industrialized world.

#### 1.3 The path from the Industrial Revolution to the Global Warming

Analyzing the connections between industrialization, consumption and environmental consequences. Understanding the status-quo and convenient ways of thinking (deeper descriptions in Unit 4). Collection of charts and studies.

#### 1.4 Globalization, Inequality and the misconception of Darwinism

Analyzing causes and consequences of globalization. Interpreting the data from UN Millennium report, The UNDP State of Human Development Report through Gapminder and other sources. Mapping the inequality factors. Framing the misinterpretation of Darwin's "the survival of the fittest" in the modern economy (by ignoring contextual factors). Comparing GDP (Gross Domestic Product) and GPI (Genuine Progress Indicator by rprogress.org)

#### 1.5 Design as a part of the problem. design as a tool of consumption.

Design is not only framed by the post-industrial consequences, Design is part in creating the actual situation. Designers have become partners in creating problems rather than problem solvers. The new times for design is in its first steps, and it is about the role of designers as a problem identifiers (deeper description in Unit 3). This section analyze what designers have done in the twentieth century and what can be done in the twenty-first. (Introducing tools from Unit 5 and case-studies from Unit 6)

#### 1.6 Designers as interpreters

This section takes a look at more common misunderstandings and simplified interpretations or misinterpretations of terms. Intends to reveal different meanings of common vocabulary. Differences between growth and development, for understanding sustainable development. Differences between consumption and consumerism, efficiency and effectiveness, sufficiency and efficiency. Partial or wrong questions driving to ill-formulated problems (linked with concept in Unit 3.4 and examples from Unit 4). Designers as a reflective practitioners (inclined to engage messy but crucially important problems).

"We have built a world of Sybaritic wealth for a few and Calcuttan poverty for a growing underclass".

—Orr, David W. (2004)

*Earth in Mind. On Education, Environment and the Human Prospect*, Island Press



## Unit 2

### Introduction to Sustainability.

#### Components:

Lecture | Handout | Readings

Weekly tour to websites about sustainability

Exploration: Making connections on a white board I

Summarize articles, book chapters and/or key-authors, and present it to the class (work in groups)

#### Contents:

Sustainable development is defined as “meeting the needs of the present generation without compromising the ability of future generations to meet their own needs”.<sup>1</sup> A sustainable world, is a Design problem rather than a Management problem.<sup>2</sup>

<sup>1</sup> Bruntland, G (1987)

*Our common future: The World Commission on Environment and Development*, Oxford Press

<sup>2</sup> Hawken, P. (1994).

*The Ecology of Commerce*, HarperBusiness.

#### 2.1 Sustainability: brief and extended definitions

Definitions. Etymology of Sustainability. Etymology and Epistemology of Ecology.

What do we have to sustain? (introduction to restorative design from Unit 5.5)

Sustainable Development definition and triple bottom-line assessment.

The Hannover Principles by William McDonough

#### 2.2 Framing the issues involved in Sustainability (introduction)

Energy, waste, social aspects, environmental aspects, human health, among others issues (deeper descriptions in Unit 4). Collection of charts about sustainability issues.

#### 2.3 A slow revolution: Evolution from Ecology, Eco-Design and Green Design to Sustainability and Design for Sustainability

Chronology of the meeting of Ecology and Design. A brief 40 year-old history, from first concerns in the 60's (Maldonado) and 70's (Papanek) to the present (Hawken, McDonough, Orr)

#### 2.4 Multidisciplinary aspects of Sustainability

The meeting of Design and Sustainability in a multidisciplinary context. The connections with Anthropology, Economics, Engineering, Urbanism among many other fields. The rising of synergies between specialties, towards broader approaches. Arbitrary limits. Political will.

draft

## Unit 3

### Design for Sustainability I: the will to act

Components:

Lecture | Handout | Readings

Summarize holistic approach by Hazel Henderson and present it to the class (work in groups)

Exploration: Making connections on a white board II

Project 1: field-trip, searching for unsustainable systems and habits on campus. Present the results to the class

Contents:

“When we have hope in something, we also have something to say to ourselves; so, too, designing and planning become superfluous when we have nothing to hope for, nothing to say to ourselves. Whereas hope without planning is a particular form of alienated behavior, planning without hope is its most typical form”.

—Maldonado, T. (1972). *Design, nature, and revolution; toward a critical ecology*, Harper & Row.

“The most important ability that a designer can bring is to recognize, isolate, define and solve problems.”

—Papanek, V. (1984) *Design for the real world: human ecology and social change*, Van Nostrand Reinhold.

#### 3.1 Holistic approach.

Turning linear thinking to cycle thinking, short-term thinking to long-term thinking (Hazel Henderson)

#### 3.2 The Design process and DfS process

Common approaches between design process and methodology and Sustainability needs. Based on ICIS-Lund, Okala, UNEP-Delft's D4S, John Chris Jones' Nature Mimic and other related design sources.

#### 3.3 Responsible Design, concepts and practice.

The new paradigm of Design. Ethics meets the emergency. (linked with Unit 4.6). The morals of Design.

#### 3.4 Designers as problem identifiers, designers as generalists.

Papanek's, Maldonado's, Orr's, Margolin's and others concepts. (linked with Unit 4.6)

#### 3.5 Design within limitations

Defining the limits. Papanek's triad of limitations and other theories. Edward DeBono's "6 hats discussion model" and "lateral thinking". Rittel's wicked problems approach. Principles of Thermodynamics and understanding low and high entropy.

#### 3.6 Research for DfS

Finding the cycle of designs, "life" of materials. (connected with tools in Unit 5.7) Questioning everything. Looking for unsustainable situations around our routines.

## Unit 4

### Design for Sustainability II: the issues of Sustainability.

Interconnections with consumption culture, human behavior and political will.

#### Components:

2 Lectures: DfS films: Al Gore's *Unconvenient Truth*, *The 11th Hour* (movies) fragments from *Children of Men*, *Brazil*, *AI*, independent movies and documentaries among other options. Local practitioners of sustainability (guest speakers)

Handout | Readings

Excercise 1 in class: transportation, industry, consumption and its connections with Global Warming. Crit in class

Excercise 2 in class: rough idea of zero waste product of design (anticipating final project) Crit in class

#### Contents:

##### 4.1 Energy

The numbers of energy resources: mapping the local and global situation.

Re-establishing the connection with the sun, the model of photosynthesis.

Alternatives to fossil fuels (examples in Unit 6)

Autoefficiency: re-defining the power net. Intelligent appliances, smart users. Green roofs and biosystems.

Working with and despite of corporations and status quo.

##### 4.2 Waste treatment

The natural process: waste equals food (cases given from Unit 6). Understanding cycling, recycling, recycled, recyclable, downcycling and upcycling.

##### 4.3 Environmental harm

Human footprint. Agressive industry and agriculture. CO2 emissions and greenhouse effect. Pesticides and fertilizers. Depletion of natural resources and wildlife. Modifying the ecosystems. Climate change and its consequences. Analysing WTO-UNEP 2007 models. Radiative effects definition. Natural versus anthropogenic factors.

Cycling to linear industrial stepback and linear to cycle restorative design.

##### 4.4 Human health

Ask why this happens before research how solve it: carcinogen substances, heavy metals, toxins and dioxins (Helen Caldicott).

Water, food, soil as health factors. Overpopulation.

##### 4.5 Social (side)-effects

Local-global pattern: polarity and inequality. New ways of poverty and extreme poverty. Dropback in education and healthcare. Social behavior change. Crime increasing rates. Terror as a reaction and justification. (material from Vandana Shiva, Hazel Henderson, John Saul among other authors)

##### 4.6 Products of Design

Analysis of design creations and communications: examples, brainstorming and free associations. Should this exist? Are we real consumers or efficient discarders? VCD products. Green papers: standards and regulations, state of the art. (Unit 6.1)

“We’ve reached a point where the value we do add to our economy is now being outweighed by the value we are removing, not only from future generations in term of diminished resources, but from ourselves in terms of unlivable cities, deadening jobs, deteriorating health, and rising crime. In biological terms, we have become a parasite and are devouring our host...”

Hawken, P. (1994).

*The Ecology of Commerce*, HarperBusiness.

## Unit 5

### Conceptual tools.

#### Components:

Lecture | Handout | Readings

Experimentation: understanding LCA and other assessment methods (guest speaker)

Excercise 3 in class: sketching from statements. Crit in class

Project 2: Communicating Sustainability: the medium is the message. Crit in class

#### Contents:

##### 5.1 Triple bottom line sustainability strategy

A method to balance social, environmental and economic factors, towards responsible practice and excellence in products of design.

##### 5.2 Biomimicry: inspiration in the best possible design (nature)

Definition. Concepts: Nature as model, Nature as measure, Nature as mentor. (from Janine Benyus' *Biomimicry*) Applied biomimics. Patterns in nature (from David Orr). Swarm theory: ants, bees and birds.

##### 5.3 Slowdesign: a contra-cultural vision

Slow revolution: a reaction against human running. A holistic approach to design.

Slow design as long term thinking. Slow design and its connections with Biomimicry. (based on Fuad-Luke's Slowlab concepts.

##### 5.4 Communicating Sustainability

Spreading and educating towards positive human change: Social marketing for DFS. Common mistakes and possible solutions for public campaigns. Common iconic places, new vocabulary and jargon. Activist design. Eco-footprint calculators on internet. Snobby risks and politization (from Al Gore's book)

##### 5.5 Restorative design

"Less bad" is not enough. The myths of efficiency. From efficiency to eco-effectiveness. Ways to pay it back to nature and ourselves with economic sense.

##### 5.6 Inclusive design and user-centered design principles applied to Design for Sustainability (to develop optionally)

##### 5.7 For good is for best vs. the harmless the better: overview of assessment tools for products of design.

Life Cycle Assessment (LCA), a math tool Based on IIIIEE IcIs-Lund material. Ecological Footprint (EF), based on Vrije University Amsterdam. GLUA, based on Wuppertal Institute. Impact matrix and 8-point wheel based on UNEP-Delft's D4S. Ha per person concept based on Ecofoot and GPI by Rprogress.

### 5.8 Benchmarking Sustainability

Information design: developing models to rank and benchmark with sustainability data, criteria based on Sustainlane.us and UNEP-Delft's D4S

### 5.9 Macro solutions: tools from Politics, Economy and Marketing

Clean Development Mechanism, green tax, carbon tax trade or “carbon colonialism”: pros and cons of a controversial regulation applied in the U.S. European Union and extended to other continents (from Patrick Bond). United Nations initiatives and the NGO's community. Kyoto protocol and other global manifestations.

draft

## Unit 6

### DfS Case-studies.

#### Components:

Lecture: project gallery

Handout | Readings

Project 3: Research on detect more sustainable designs locally, regionally and globally. Present the results to the class

Project 4: Applying assessment to a conference package, presenting alternatives.

Project 5: Developing a widget for sustainable scenarios (project coordinated with 593-594 classes)

#### Contents:

“Fear not dear Solutionists; the future is upon us. It is ripe for the taking. A change of design is under construction.”

—Perry Farrell

#### 6.1 No waste products, no waste packaging, no waste promotional material

Examples included in Fuad-Luke’s, Papanek’s, Suzuki’s books and articles, among others. Green papers report from Applied Arts: CSA, SFI, FSC, PEFC certifications, sustainable management forests and recycling.

#### 6.2 More communication devices and more trees.

Electronic paper and other innovative materials. (based on Hazel Henderson’s “The age of light”) Projections, holograms and other inventions based on light. The reduction of using chlorine and pulp based papers and non-biodegradable plastics (based on Mreal and Hemlock).

#### 6.3 Alternative Energy

Examples included in Mau’s, Manzini’s, Benyus’ books and websites among others.

#### 6.4 Sufficient nodes (homes) and efficient systems (cities)

Examples included in related books. Material from UNEP-Futerra’s Communicating Sustainability. About waste, forestry, energy and transportation (by Torleif Bramryd , Christian Henriksson & Michael Johansson, Department of Environmental Strategies of Lund University, Sweden)

Two sustainable communities: BOØ1 at Malmo and Christiania at Copenhagen.

Earthship biotecture by Mike Reynolds.

More examples collected from Canada and worldwide.

#### 6.5 Sustainable food

Examples included in Sustainable and Free Range Studios

#### 6.6 Carbon calculators, mapping and other sustainability widgets

Examples included from Breathing Earth, Gapminder, Ecofoot, RProgress

#### Final Project

Development of an innovative no-waste design in any field—an object, system, visual communication piece, packaging, etc. Detecting a problem, analyzing, design solutions, justify a proposal, describe implementation.

Final exhibition.

## Class materials

### 1. Structure, outline and schedule of the course

### 2. Recommended pre-readings

Papanek, V. (1984). *Design for the real world: human ecology and social change*, Van Nostrand Reinhold.

McDonough, W. (2002). *Cradle to cradle: remaking the way we make things*. New York, North Point Press.

Hawken, P. (1994). *The Ecology of Commerce*, HarperBusiness.

### 3. Handouts

For units 1 to 6, projects 1 to 5 and final project, for exercises 1 to 3

### 4. Interactive exercises

Making connections on a white board

### 5. Slide-shows

We have turned our world unsustainable, how did we get here?

Sustainability: brief and extended definitions

Design within limitations

Energy, waste, environmental harm, human health, social side-effects

Products of design

Conceptual tools gallery

Design for Sustainability gallery

### 6. Tentative Sample guest's lectures

*Sustainable everyday*. Local guest speaker from Carbonbusters

*The future of sustainable energy*. Speaker from Parkland institute and Edmonton Waste Management

*Reaching Kyoto protocol goals*. Speaker from City of Edmonton.

*Witness of the meltdown*. Speaker from Canadian Circumpolar Institute.

*The new paradigms of creating sustainable products*. Guest speaker from UofA industrial design.

*About ecology, sustainability and institutional and political will*. Guest speaker from UofA Ecology, Biological Sciences, and Faculty of Science.

## Reading sources (tentative)

- Benyus, J. M. (1997) *Biomimicry : innovation inspired by nature*. New York: Perennial.
- Bookchin, M. (1980). *Toward an Ecological Society*. Montreal: Black Rose Books.
- Buber, M. (1966). *Paths in Utopia*. Boston: Beacon Press.
- Caldicott, H. (1992). *If you love this planet : a plan to heal the earth*  
New York: W.W. Norton.
- Crowe, N. *Nature and the Idea of a Man-made-world*.
- Flannery, Tim (2007). *We are the weather makers.*, New York: Harper Collins.
- Frascara, J. (1997). *User-centered Graphic Design. Mass communication and social change.*, Taylor & Francis.
- Frascara, J. (2002). *Design and the Social Sciences: Making Connections*,  
London: Taylor & Francis.
- Fuad-Luke, A. (2005). *The Eco-Design Handbook: A Complete Sourcebook for the Home and Office.* London, Thames & Hudson.
- Hawken, P. (1994). *The Ecology of Commerce*, New York: HarperBusiness.
- Irwin, T. (2003). "A Crisis in Perception." *Design Issues*.
- Koestler, A. (1967). *The ghost in the machine*. New York: Macmillan.
- Maldonado, T. (1972). *Design, nature, and revolution; toward a critical ecology*. New York: Harper & Row.
- Manzini, E.-J., Francois (2003). *Sustainable Everyday*, Milano: Edizioni Ambiente.
- Margolin and Buchanan, R. (1995). *The idea of design*, Cambridge, Mass: MIT Press.
- Mau, B. (2004). *Massive change*, London: Phaidon.
- Max-Neef, M. (1991). *Human Scale Development*, New York: Apex Press.
- McDonough, W. (2002). *Cradle to cradle: remaking the way we make things*.  
New York, North Point Press.
- Orr, D. (1992). *Ecological Literacy: Education and the Transition to a Postmodern World*.  
New York: University of New York Press.
- Orr, D. (2002). *The Nature of Design*. New York: Oxford University Press.



Orr, D. (2004). *Earth in Mind. On Education, Environment and the Human Prospect*. Washington, DC: Island Press.

Ortbal, J., Lange, M., and Carroll, M. (1996). *The Ecology of Design*, New York: The AIGA Press.

Papanek, V. (1984). *Design for the real world : human ecology and social change*, New York: Van Nostrand Reinhold.

UNDP, R. (2005). *The State of Human Development*, in Human Development Report 2005: Human Development Reports UNDP.

Soer, M. (2006). *Graphic Design is Immaterial*, in Journal of Design in State of the art AIGA [Electronic Version]. AIGA from <http://voice.aiga.org/content.cfm?ContentAlias=%5Fgetfullarticle&aid=2325495>.

Suzuki, D. (2002). *Good news for a change : how everyday people are helping the planet*, Greystone Books.

Thorpe, A. (2007). *The Designers' Atlas of Sustainability*. Washington: Island Press.

Welter, V. M. (2002). *Biopolis*. Cambridge, Mass.: MIT Press.

Whitehead, M. (2007). *Spaces of sustainability : geographical perspectives on the sustainable society*. New York: Routledge.

Williams, C. (1995). *Origins of Form*. Stamford, CT: Architectural Book Pub.

[worldrevolution.org](http://worldrevolution.org) overview of global issues.

draft

## Resources online (updated by January 2008)

EarthAirWaterFire, created by students in Des 590  
and ARTH 409/509 at U. of A.

[sustainabilitydatabase.blogspot.com](http://sustainabilitydatabase.blogspot.com)

[aashe.org](http://aashe.org)

[abc.net.au/science/planetslayer/planetslayer.htm](http://abc.net.au/science/planetslayer/planetslayer.htm)

[academyart.edu/graphic-design-school/mfa\\_faculty.html](http://academyart.edu/graphic-design-school/mfa_faculty.html)

[advancegreen.ca](http://advancegreen.ca)

[aiga.org](http://aiga.org)

[ant-design.ca/research](http://ant-design.ca/research)

[apple.com/hotnews/agreenerapple/](http://apple.com/hotnews/agreenerapple/)

[arcticnet-ulaval.ca](http://arcticnet-ulaval.ca)

[ase.tufts.edu/polsci/faculty/portney/revisedRankingCities.pdf](http://ase.tufts.edu/polsci/faculty/portney/revisedRankingCities.pdf)

[autos.canada.com/green/index.html](http://autos.canada.com/green/index.html)

[awma.org/awards/index.html](http://awma.org/awards/index.html)

[bcit.ca](http://bcit.ca)

[bfj.org](http://bfj.org)

[bioenergias.eu](http://bioenergias.eu)

[biomimicry.net](http://biomimicry.net)

[bioneers.org](http://bioneers.org)

[blog.carbon-360.com/](http://blog.carbon-360.com/)

[bread.org](http://bread.org)

[breathingearth.net](http://breathingearth.net)

[calvert-henderson.com/](http://calvert-henderson.com/)

[carbonbusters.org](http://carbonbusters.org)

[channel4.com/news/articles/world/speed%20reader/164940](http://channel4.com/news/articles/world/speed%20reader/164940)

[citeulike.org](http://citeulike.org)

[citiesplus.ca/cdsubmission/content\\_main/c\\_plus\\_full.htm](http://citiesplus.ca/cdsubmission/content_main/c_plus_full.htm)

[climatecrisis.net](http://climatecrisis.net)

[cnn.com/2007/TECH/ptech/08/01/horizon.tech/index.html](http://cnn.com/2007/TECH/ptech/08/01/horizon.tech/index.html)

[cognexus.org/id42.htm](http://cognexus.org/id42.htm)

[compostmodern.org](http://compostmodern.org)

[conference.ewmce.com](http://conference.ewmce.com)

[connectingforchange.org](http://connectingforchange.org)

[cooperativeresearch.org](http://cooperativeresearch.org)

[copvcia.com](http://copvcia.com)

[csin-rcid.ca/](http://csin-rcid.ca/)

[csin-rcid.ca/resources.aspx](http://csin-rcid.ca/resources.aspx)

[d4s-de.org](http://d4s-de.org)

[data.giss.nasa.gov/gistemp/maps/](http://data.giss.nasa.gov/gistemp/maps/)

[daversitycode.com](http://daversitycode.com)

[daversitycode.com/earthscope](http://daversitycode.com/earthscope)

[davidsuzuki.org](http://davidsuzuki.org)

[deceptiondollar.com](http://deceptiondollar.com)

[dep.org.uk/activities/cities-activities.htm](http://dep.org.uk/activities/cities-activities.htm)

[designcanchange.org](http://designcanchange.org)

[designersaccord.org/](http://designersaccord.org/)

[designers-atlas.net](http://designers-atlas.net)

designfortheworld.org  
designforum.aiga.org  
earthcharter.org  
earthday.net  
earthobservatory.nasa.gov/  
earthobservatory.nasa.gov/Observatory/runqt.php3  
earthobservatory.nasa.gov/Study/Bees/  
earthship.net  
ec.gc.ca/soer-ree/English/Scip/default.cfm  
ec.gc.ca/soer-ree/English/scip/guidelines.cfm  
eciad.ca  
eciad.ca/~elverumd  
ecofoot.org  
ecologicalfootprint.org  
ecoworld.com/home/articles2.cfm?tid=445  
eink.com/technology/index.html  
emma.polimi.it/emma/showEvent.do?idEvent=23  
endowmentinstitute.org/report2008/profile157.pdf  
endowmentinstitute.org/sustainability  
endowmentinstitute.org/sustainability/CollegeSustainabilityReportCard2008.pdf  
enmax.com/Energy/Whats+New/Renewable+Energy+Solutions  
enn.com  
environment.gov.ab.ca  
environment.gov.ab.ca/edu  
environmentalindicators.com  
environmentconference.alberta.ca/greening\_your\_poster.html  
epeat.net/  
ewmce.com  
exargentina.org  
experts.ualberta.ca  
footprint.wwf.org.uk  
fossil-of-the-day.org/  
freakonomics.com  
fritjofcapra.net  
gapminder.org/downloads/presentations/human-development-trends-2005.html  
gdc.net  
gigaom.com/2007/05/02/eco-trends-green-apple  
global-cool.com  
globalresearch.ca  
globalrichlist.com  
globalwarmingart.com/  
globalwarmingart.com/wiki/Image:Greenhouse\_Gas\_by\_Sector.png  
greenoptions.com  
greenpeace.org/canada  
guardian.co.uk/environment/2007/nov/04/climatechange.scienceofclimatechangehdr.undp.org  
helencaldicott.com  
howdesign.com/dc/features/questioneverything.asp  
iciscenter.org  
iclei.org/  
iclei.org/index.php?id=597

id2.ca  
idebate.org  
idebate.org/thepeoplespeak  
idsa.org/whatsnew/sections/ecosection/okala.html  
igloo.org/peoplespeak  
iht.com/articles/2007/01/28/features/design29.php?page=2  
iisd.org/educate/declarat/tallore.htm  
iisd.org/measure/compendium/  
indexaward.dk  
infowars.com  
inhabitat.com/2007/08/30/index-awards-solar-bottle  
insideeducation.ca  
ivm5.ivm.vu.nl  
joinred.com  
jonano.com/  
kidsfootprint.org  
legitgov.org  
lunamedia.org  
makepovertyhistory.org  
massivechange.com  
mattsoar.org  
mdgmonitor.org  
mdgmonitor.org  
mcc.ca/Main/explore.jsp?FOLDER%3C%3Efolder\_id=2534374302883315&bmUID=1200547201958  
media.mit.edu/micromedia/elecpaper.html  
meetthegreens.org/  
millenniumindicators.un.org  
mission-sustainability.org  
mitpressjournals.org/doi/abs/10.1162/desi.2006.22.2.56?cookieSet=1&journalCode=desi  
myspace.com/ourplanet  
naturalcapital.org  
naturalstep.ca/elearning/SBNS\_Introduction.htm  
nature.com/climate/index.html  
nature.com/news/index.html  
nbrti.org  
news.bbc.co.uk/2/hi/in\_depth/7075759.stm  
news.bbc.co.uk/2/hi/in\_depth/7075759.stm  
ngm.nationalgeographic.com/ngm/2008-01/high-tech-trash/carroll-text.html  
nscadesign.ca  
nyas.org  
oberlin.edu  
oikos.org  
oilempire.us  
oil-price.net  
omidyar.net  
onehundredthings.wordpress.com  
onlinejournal.com  
originenergy.com.au/carbon  
ottawa.ca/city\_services/recycling\_garbage/rethink\_garbage/compared\_en.html  
ourworld.compuserve.com

parsons.edu  
pas.org.ar  
pbs.org/wgbh/nova/solar  
pc.blogspot.com/2006/07/sustainable-cities-are-unaffordable.html  
personalrapidtransit.com  
philly.com/inquirer/world\_us/20070513\_Better\_rapid\_transit\_Bus\_advocates\_think\_so.html  
plasticlogic.com/  
policyblog.verizon.com/policyblog/blogs/policyblog/kathybrown9/251/hybrid-vans-fuel-cells-and-verizon.aspx  
policychannel.com  
progn.com  
questionsquestions.net  
rec.org/REC/Programs/SustainableCities  
remarkable.co.uk  
re-nourish.com  
resources4rethinking.ca  
robertlpeters.com/  
rprogress.org  
rr.ualberta.ca/people/hamann/climate/index.asp?page=climate-ab  
safeclimate.net/calculator  
sala.ubc.ca/category/tags/sustainability  
sala.ubc.ca/programs/environmental-design  
schumachercollege.org.uk  
sciam.com  
scottcamazine.com/personal/DesignNature  
services.alphaworks.ibm.com/manyeyes  
sfu.ca  
sierraclub.org  
slowlab.org/  
sodis.ch  
standdown.net  
stopglobalwarming.com  
su.ualberta.ca/services\_and\_businesses/services/ecopage  
su.ualberta.ca/services\_and\_businesses/services/ecopage/What%20is%20Sustainability  
susdes.org  
sustain.ubc.ca  
sustainability.aiga.org  
sustainability.syncrude.ca/sustainability2005/index.shtml  
sustainabilitydatabase.blogspot.com  
sustainabilityindicators.org/  
sustainable-city.org  
sustainabletable.org  
sustainlane.us/overview.jsp  
sustreport.org/  
sustreport.org/issues/sust\_comm3.html#howare  
sustreport.org/resource/es\_timeline.htm  
teragrid.org/news/sci-high/fuel\_cell\_cometh.html  
terrapass.com/  
thegatewayonline.ca/green-light-for-green-south-campus-development-20070725-631.html  
thegreenguide.com/  
thegreenguide.com/green\_home

theideagroup.ca/consumablewaste  
thinkenergy.com  
thinkpublic.com/news/index.php  
treehugger.com  
treehugger.com/files/2005/04/wave\_power\_alte\_1.php  
treehugger.com/files/2005/07/pollution\_eatin.php  
treehugger.com/files/2005/12/magenn\_air\_roto.php  
treehugger.com/files/2007/02/bloomframe\_wind.php  
treehugger.com/files/2007/06/no\_more\_power\_c.php  
treehugger.com/mt/mt-tags.fcgi?tag=oil%20sands&blog\_id=1  
truth-now.com  
ualberta.ca/~ersc/Handbook/section1/other.htm  
ualberta.ca/~ersc/Handbook/section2/ecohouse.htm  
ualberta.ca/ERSC  
ualberta.ca/PARKLAND  
ucalgary.ca  
ulsf.org/programs\_talloires.html  
ulsf.org/programs\_talloires\_signatories.html  
un.org/summit2005  
una.ac.cr/ambi/Ambien-Tico/107/gudynas.htm  
undp.org  
unep.fr/pc/sustain/advertising/ads.htm  
unep.org  
unep.org/geo/geo4/media/graphics/index.asp  
universe.daylife.com  
unmillenniumproject.org  
usctgateway.net/  
usctgateway.net/tool/  
utne.com  
vcu.edu  
visiblestrategies.com  
voice.aiga.org  
web.worldbank.org  
weblogs.clarin.com/los-amores/archives/2007/04/el-medio-ambiente-no-le-importa-a-nadie-o-si.html  
weblogs.clarin.com/los-amores/archives/2007/05/el-efecto-al-gore-y-una-teoria-urgente-de-la-obscuridad.html  
wiserearth.org  
worldchanging.com  
worldrevolution.org  
worldwatch.org  
wtc7.net  
www3.gov.ab.ca/env/climate/index.html  
www3.gov.ab.ca/env/soe/index.html  
y-conference.com/y13/home.html