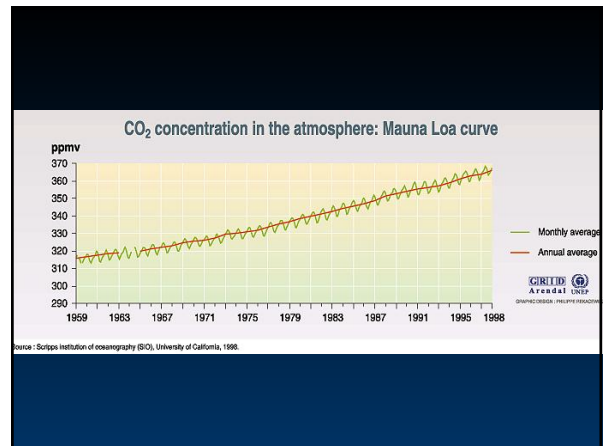
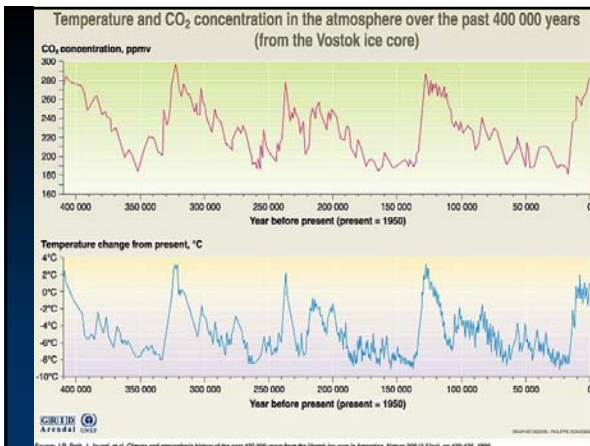




Michel de Spot, P.Eng.  
EWB Conference  
UBC, March 13, 2004

## Sustainability: What does it mean?

Sustainability simply refers to the long-term viability of an activity, system, or series of interdependent systems.



## Sustainability



40,000 Delegates  
100 Heads of States  
8000 Civil Societies & NGO's  
1000 Business Representatives  
120 CEO's and Board Chair



## Progress Report

We are at a unique turning point in history  
*From Act of God to Act of Humans*

15% of land cover degraded  
50% rivers are polluted  
or depleted  
33% fish stocks damaged  
2.4% forest fallen in 10 years  
50% humanity (2.8 billion) live on  
less than \$2 per day



## Sustainability: original

*"...meets the needs of the present without compromising the ability of future generations to meet their own needs". Bruntland*

Intergenerational equity

## Sustainability: conservation

*"...leave the world better than you found it, take no more than you need, try not to harm life of the environment, make amends if you do..."*

Paul Hawken

the ecology of commerce: preserve the natural capital

## Sustainability: Well-Being

*"...parallel care and respect for the ecosystem and for the people within."* NRTEE

the goal of sustainability: to achieve human and ecosystem well-being together.

Result-based pro-active approach

Measurement of benefits, instead of setting limits to negative impacts

## Sustainability: What does it mean for us?

It is related to our decisions  
and activities.



## Activities

Set of human actions,  
ranging from paid work to  
free occupations.



## Engineering Activities

Building a bridge is

- Good for the economy
- Good for the society
- Good for engineers.
- Example of typical engineering work



## Sustainable Activities



## Six Sustainability Issues

- Water
- Climate Change
- Energy
- Natural Resources
- Consumption
- Poverty



## Water

Water is essential to life.

Water demand doubles every 20 years.

1/3 of humanity have water shortage.

At current rate, all surface water will be consumed in 2100

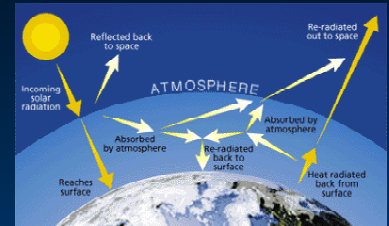


## Water: 3 future scenarios

1. **Business as usual:** ....leading to a major crisis
2. **Technology,** economics and the private sector: ...based on globalisation of the economy and global market. Leave behind the poorest and does not protect the environment.
3. **Values and lifestyle:** ....Education, social actions, sustainable development, equity, solidarity, environment protection, innovation, accountability, eco-efficiency,....

## Climate Change

### Greenhouse effect



## Climate Change

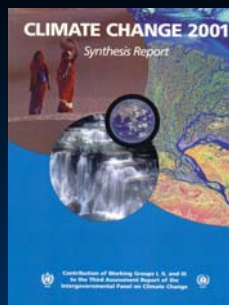
Climate change is occurring

It is very likely due to human activities

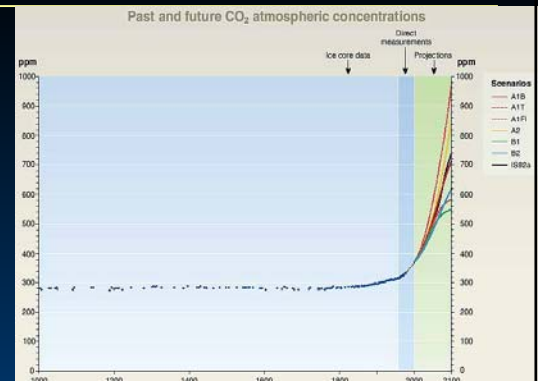
CO<sub>2</sub> concentration has increased by 31% since 1750 (280 -> 360 ppm)

Present CO<sub>2</sub> concentration highest for the last 420,000 years and likely for the past 20 million years.

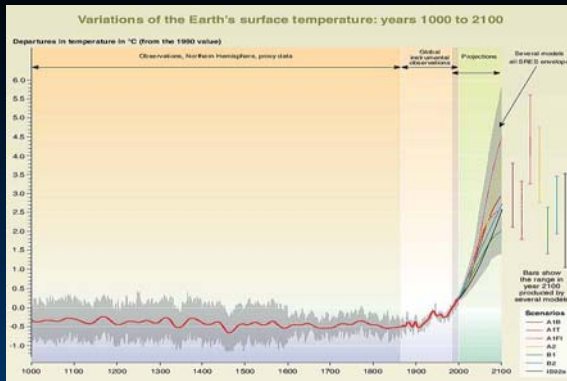
The current rate of increase is unprecedented during at least the past 20,000 years.



## CO<sub>2</sub> concentration is rising



## ... so is average global temperature.



## 2003: Strange Weather in BC

2500 wildfires

Floods in autumn

Drought in the summer

Freezing in November

The lowest temperature on record for November

Record rain fall in October

The Fraser river at its lowest peak since record keeping (90yr)



## 2003- Expensive Weather in Canada

Halifax- the 1st time the eye of a hurricane hits the city since 1893, 100 millions trees and 300,000 houses damaged in the region.

One billion \$ cost for fire-fighting across the country

Intense drought in the prairies

March downpour in the Atlantic provinces, the most expensive weather disaster in the history of the Maritimes

Massive ice storms in New Brunswick



## 2003- World Record Weather

16 intense tropical storm in the Atlantic

Heavy snow on Alberta in April and May

2003 was the 11th consecutive year in Canada with higher temperature than average

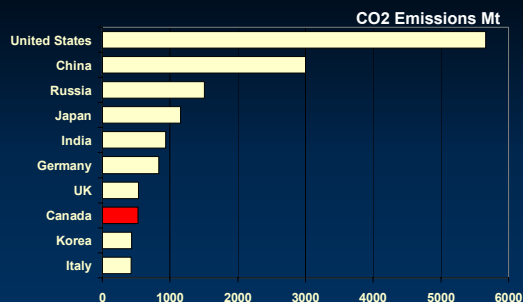
2003 is the third-warmest year since records began in 1981

In Europe, heat waves killed 21,000 people

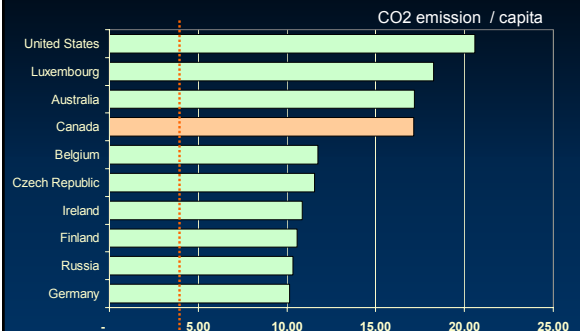
Hottest summer in 500 years



## Kyoto – Emissions

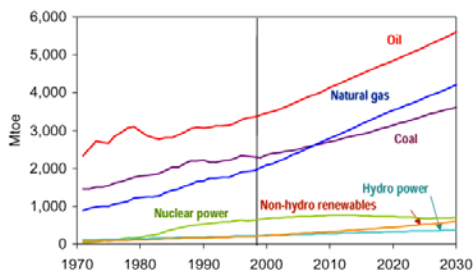


## Kyoto – Emission per capita



## Energy

### World Primary Energy Demand



IEA 2002

## Energy

### Law of thermodynamics

Reality of the market: Hidden costs and subsidies

Oil : nearly depleted, large investment

Coal: Huge GHG impact ( 1 MWh = 1 t CO2)

Natural Gas: Transition but reduced availability and increased price

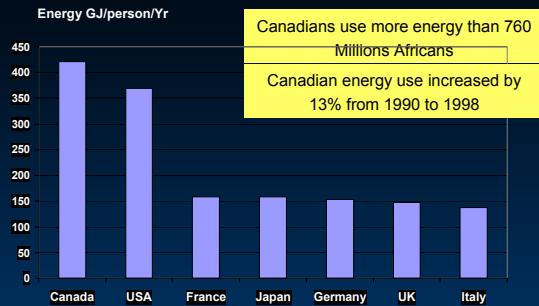
Nuclear: long term issue, the most expensive when taking into account decommissioning

Hydrogen: not an energy source

Wind: Fastest growing, high tech, jobs



## Energy Consumption per Capita



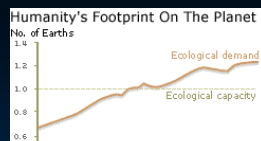
## Natural Resources

- 15% of land cover degraded
- 50% rivers are polluted or depleted
- 33% fish stocks damaged
- 2.4% forest fallen in 10 years



## Consumption

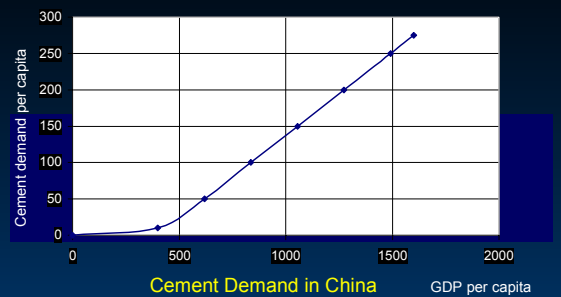
Human consumption now exceeds earth's ecological capacity



How many planets do we have?

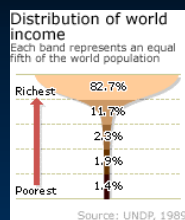


## Rebound Effect



## Poverty

25% of the world population is surviving with less than \$1 a day.



## Our Options

are we going to contribute to make the future we want happen?

...or are we going to just wait and see what type of future happens?

...or are we going to ask when the future arrives, what happened?



## Connexity



## Engineers Influence

What activities are we good at?



## Diversity of the profession

Type of activity may depend on

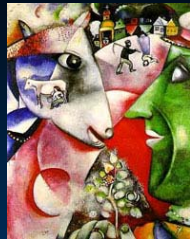
**Discipline:** Agriculture, bio, chemical, civil, structural, computer, electrical, electronic, forestry, geological, industrial, mechanical, metallurgical, mining, surveying, geoscience, geology, geochemistry, geophysics, geotechnics

**Education:** BSc, MSc, MBA, PhD.

**Responsibility:** Management, supervised, EIT/GIT

**Location:** City, plant, remote site, overseas

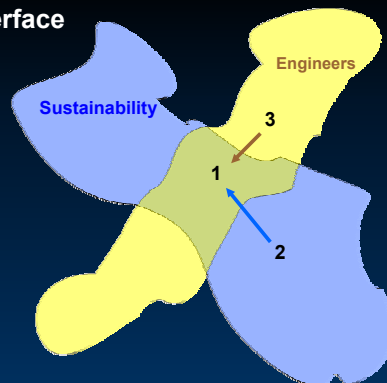
**Sector:** Consulting, utilities, government, primary and resource industry, construction, high tech, service.



## Engineers Activities



## Interface



## Interface Results

Eco-efficiency: new Criteria / paradigm

Skill Sets : Problem solving and expand boundaries

Professional vs private Realm

Policy: Ethics, professional practice

Sustainability Education: Best practice

## Sustainability & APEGBC

APEGBC actively working on identifying, promoting, and facilitating the implementation of the sustainability principles within the profession for more than 10 years



## Road Map



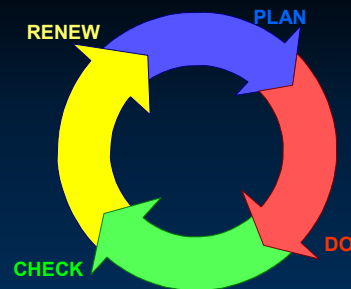
## Sustainability Guidelines

Develop awareness  
Fully investigate the impact of potential actions  
Evaluate alternative solutions  
Consultation and Partnership

from "either or ..."  
to  
"... and ..."



## SMS



## Initiatives

Sustainability researchers (2001-2004)  
Primer  
Communication plan  
Sustainability.ca Web site  
Sustainability Now Newsletter  
LEED  
CPD modules  
Doors to Sustainability Exhibition



## Primers

General: What is sustainability  
Guidelines explained  
Municipal  
Mining  
Green Building  
Climate Change  
Transportation  
Energy  
Material  
Industrial, eco-efficiency





- EIT/GIT requirements
- Licensing requirements
- Practice review Guidelines
- Professional Practice Guidelines
- Award



Learn  
Participate  
Work



GVRD – Sustainable Region Initiative (SRI)  
Olympics 2010  
South East False Creek (SEFC)  
UBC



LEED  
CaGBC

[illegible]

**58 LEED Registered Projects**

**{3} LEED Certified Projects**

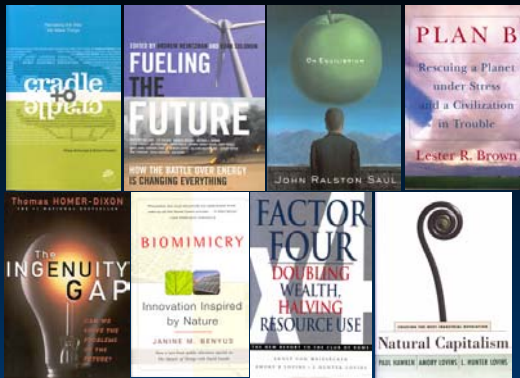
**(525) LEED Accredited Professionals**

State	LEED Registered Projects	LEED Certified Projects	LEED Accredited Professionals
Alaska	0	0	0
Arizona	0	0	0
California	31	{3}	(257)
Colorado	13	0	(164)
Connecticut	0	0	0
Delaware	0	0	0
District of Columbia	0	0	0
Florida	0	0	0
Georgia	1	0	(1)
Idaho	0	0	0
Illinois	2	0	(15)
Indiana	0	0	0
Iowa	0	0	0
Kansas	0	0	0
Kentucky	0	0	0
Louisiana	0	0	0
Maine	0	0	0
Maryland	0	0	0
Massachusetts	0	0	0
Michigan	0	0	0
Minnesota	0	0	0
Mississippi	0	0	0
Missouri	0	0	0
Montana	0	0	0
Nebraska	0	0	0
Nevada	0	0	0
New Hampshire	0	0	0
New Jersey	0	0	0
New Mexico	0	0	0
New York	5	0	(70)
North Carolina	4	0	(8)
North Dakota	0	0	0
Ohio	0	0	0
Oklahoma	0	0	0
Oregon	0	0	0
Pennsylvania	0	0	0
Rhode Island	0	0	0
South Carolina	0	0	0
South Dakota	0	0	0
Tennessee	0	0	0
Texas	0	0	0
Utah	0	0	0
Vermont	0	0	0
Virginia	0	0	0
Washington	0	0	0
West Virginia	0	0	0
Wisconsin	0	0	0
Wyoming	0	0	0

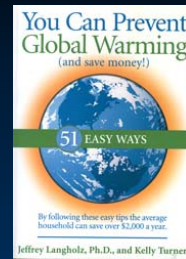
**USA Projects, Dec 03:**  
1053 registered, 80 certified

Source: USGBC, Dec 2003

## Readings



## Personal Sustainability



## Thank You

[www.sustainability.ca](http://www.sustainability.ca)

Anthea Jubb, EIT.

APEGBC Sustainability Researcher

604 412 4868

