Inovar e Criar Valor pela via da Sustentabilidade
The geology of the planet

Welcome to the Anthropocene

Humans have changed the way the world works. Now they have to change the way they think about it, too

May 26th 2011, 10:46 | From the print edition

May 26th 2011 | From the print edition

THE Earth is a big thing; if you divided it up evenly among its 7 billion inhabitants, they would get almost 1 trillion tonnes each. To think that the workings of so vast an entity could be lastingly changed by a species that has been scampering across its surface for less than 1% of 1% of its history seems, on the face of it, absurd. But it is not. Humans have become a force of nature reshaping the planet on a geological scale—but at a far-faster-than-geological speed.
Number of people living worldwide since 1700 in billions

- 1700: 1 bln
- 1804: 1 bln
- 1927: 2 bln
- 1960: 3 bln
- 1974: 4 bln
- 1987: 5 bln
- 1999: 6 bln
- 2012: 7 bln
- 2024: 8 bln
- 2048: 9 bln

Source: United Nations World Population Prospects, Deutsche Stiftung Weltbevölkerung
Growth of World Population and the History of Technology

Population (millions)

- Agricultural Revolution
- Pottery
- Invention of Plow
- 1st Irrigation
- 1st Cities
- Metallurgy
- Writing
- Mathematics
- Peak of Rome
- Peak of Greece
- 2nd Agricultural Revolution
- Invention of Airplane
- Industrial Revolution
- Genome Project
- Man Lands on Moon
- High-Speed Computers
- Internet
- PCs
- Nuclear Energy
- DNA Discovered
- Penicillin
- Automobile
- Telephone
- Germ Theory
- Railroads
- Watt Engine
- Mobile

Source: Milken Institute, Robert Fogel/University of Chicago
World Energy Consumption

Exajoules per Year


Energy Sources: Nuclear, Hydro-Elect, Nat Gas, Oil, Coal, Biofuels
World Water Consumption

- Industrial and domestic consumption
- Evaporation from reservoirs

km³ per year

World Water Consumption

**Agriculture**
- Extraction: Green
- Consumption: Light Green

**Domestic use**
- Extraction: Brown
- Consumption: Orange

**Industry**
- Extraction: Red
- Consumption: Pink

*Graph shows the cubic km per year of water consumption and extraction for different sectors from 1900 to 2025.*
Global water withdrawals, population and diet: scenario 2050... We have a problem!

Source: A. Zehnder, Swiss Federal Institute of Aquatic Science and Technology ETHZ 1999 and 2030 Water Resources Group

The present carbon cycle
Volumes and exchanges in billions of tonnes of carbon

Graphic design: Philippe Rekacewicz

GRID Arendal UNEP
“Obviously sustainability will be THE driver of innovation over the next decade(s).”

MaDhias Mueller, Mensch Innovation, Switzerland
Negócios Sustentáveis
Empreendedorismo + Ecologia
Welcome to the Anthropocene

Humans have changed the way the world works. Now they have to change the way they think about it, too

May 26th 2011 | From the print edition

THE Earth is a big thing; if you divided it up evenly among its 7 billion inhabitants, they would get almost 1 trillion tonnes each. To think that the workings of so vast an entity could be lasting changed by a species that has been scampering across its surface for less than 1% of 1% of its history seems, on the face of it, absurd. But it is not. Humans have become a force of nature reshaping the planet on a geological scale—but at a far-faster-than-geological speed.
More companies are managing sustainability to improve processes, pursue growth, and add value to their companies rather than focusing on reputation alone.

The business of sustainability: McKinsey Global Survey results
October 2011
45 Billion tonnes of CO2

No slow down in last decade

Oil crises

Post-war boom

Great depression

Cuts required for 50% chance of not exceeding 2°C
Number of years before these environmental areas become of critical importance to business operations:

- WATER
- GRID ENERGY
- OIL AND GAS
- WASTE
- OTHER NATURAL RESOURCES (e.g., wood)
- RARE EARTH METALS

**3-6 Years**

UK businesses are most likely to have a sustainability programme in place:

- Decrease in quality of products/services (26%)
- Significant change to business processes
BUT businesses are doing little to pre-empt these effects:

43% of organisations do not monitor the risks to their business of environmentally related shocks such as energy price rises and environmental disasters.

52% haven’t set targets for managing the reduction of carbon, water or waste.

Only 13% of board directors are remunerated for achieving sustainability metrics.

% of respondents¹

<table>
<thead>
<tr>
<th>How sustainability activities are organized</th>
<th>2011, n = 3,203</th>
<th>2010, n = 1,946</th>
</tr>
</thead>
<tbody>
<tr>
<td>A few activities but no formal program to address issues</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td>Sustainability is embedded in business practices, with a formal program to address issues</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>A formal sustainability program to address issues</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>Sustainability is embedded in business practices, with no formal program to address issues</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>No sustainability activities</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

¹ Respondents who answered “don’t know” are not shown; an answer choice in the overall effectiveness question.
How sustainability activities are organized

- 2011, n = 3,203
- 2010, n = 1,946

<table>
<thead>
<tr>
<th>Category</th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>A few activities but no formal program to address issues</td>
<td>31%</td>
<td>30%</td>
</tr>
<tr>
<td>Sustainability is embedded in business practices, with a formal program to address issues</td>
<td>24%</td>
<td>22%</td>
</tr>
<tr>
<td>A formal sustainability program to address issues</td>
<td>18%</td>
<td>16%</td>
</tr>
<tr>
<td>Sustainability is embedded in business practices, with no formal program to address issues</td>
<td>18%</td>
<td>20%</td>
</tr>
<tr>
<td>No sustainability activities</td>
<td>8%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Where sustainability falls on the CEO's global agenda

- 2011, n = 2,956
- 2010, n = 1,749

<table>
<thead>
<tr>
<th>Year</th>
<th>Most important agenda priority</th>
<th>A top-three agenda priority</th>
<th>A priority, but not top three</th>
<th>Not a significant agenda item</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>2%</td>
<td>26%</td>
<td>45%</td>
<td>22%</td>
</tr>
<tr>
<td>2010</td>
<td>3%</td>
<td>23%</td>
<td>48%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Company’s overall effectiveness at managing its sustainability

- 2011, n = 2,956
- 2010, n = 1,705

<table>
<thead>
<tr>
<th>Year</th>
<th>Extremely</th>
<th>Very</th>
<th>Somewhat</th>
<th>Slightly</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>3%</td>
<td>24%</td>
<td>46%</td>
<td>21%</td>
<td>4%</td>
</tr>
<tr>
<td>2010</td>
<td>4%</td>
<td>28%</td>
<td>40%</td>
<td>21%</td>
<td>8%</td>
</tr>
</tbody>
</table>

¹ Respondents who answered “don’t know” are not shown; in 2010, “don’t know” was not given as an answer choice in the overall effectiveness question.
How much CO₂ is created by...

- 1 kg of rice - Average
- Gas patio heater per year
- Lightweight plastic bag
- 2010 World Cup
- Paperback (recycled)
- Reusable diapers (yearly)
- Electric kettle
- 1 mile average car
- 28 inch TV (1 hr)
- Vacuum cleaning (yearly)
- Laptop per hour
- 32 inch LCD TV (1 hr)
- Your yearly text messages
- Mount Etna
- A year of electric showers
- New York to London (per person)
- Bottled water (locally sourced)
- Year of cellphone calls (1 hr per day)
- Lolly
- Average world citizen
- 1 kilo of household waste

Enter CO₂ tons or random
How much CO₂ is created by...

- 220kg: reusable diapers (yearly)
- 140kg: watching 28” TV per year
- 75kg: night in a hi-carbon hotel
- 135kg: a year of emails
- 210kg: a year of coffee
- 150kg: a year's worth of wine
- 83kg: a year of toilet rolls
- 51kg: a year of tea
- 0.1t: average Malawian
- 228kg: disposable diapers (yearly)
- 182kg: a year of electric showers
- 138kg: computer for a year
- 51kg: low energy bulb (yearly)
- 90kg: to make a laptop
- 83kg: Sydney to Melbourne (per person)
- 50kg: boiling electric kettles per year (2x day)
- 230kg: yearly waste per person
- 193kg: New York to Miami (per person)

Enter CO₂ tons: [ ] go

- Kilos
- Random

Categories: electronics, energy, food & drink, global, grooming, household, transport, web
Are you ready for the resource revolution?

Heat Trapping Greenhouse Gases Produced by Cattle and Automobiles

- Average amount of methane produced by two cows each year
- Average amount of carbon dioxide produced by one car each year

Cow emissions more damaging to planet than CO2 from cars
Humans clean up the Earth, they think...
In a sustainable society, nature is not subject to systematically increasing...

...concentrations of substances extracted from the Earth’s crust,

...concentrations of substances produced by society,

...degradation by physical means,

and, in that society...

...people are not subject to conditions that systematically undermine their capacity to meet their needs.
Soluções Sustentáveis

3R

Reduzir
Reutilizar
Reciclar
Inovação é pôr as ideias em ação!
Tipos de inovação

- **Produto** (tecnologia): introdução de novos ou renovados produtos ou serviços: alteração de especificações técnicas, componentes, materiais, *software*, interface com utilizadores ou características funcionais.

- **Processo**: implementação de novos ou renovados processos de produção ou logística de bens ou serviços: alteração de técnicas, equipamentos ou *software*.

- **Organizacional**: implementação de novos métodos de organização, trabalho ou relações nas práticas do negócio.

- **Marketing**: implementação de novas abordagens de marketing: produto ou embalagem, preço, distribuição e promoção.
Inovação

é a utilização (económica) de um novo método para criação de melhores ou mais efetivos produtos, processos, serviços, tecnologias ou ideias que são aceites pelo mercado, governo e sociedade!
Inovação Sustentável

é a utilização (económica) de um novo método para a criação de melhores ou mais efetivos produtos, processos, serviços, tecnologias ou ideias que sejam aceites pelo mercado, governo e sociedade e que respeitem os quatro princípios da sustentabilidade.
Sustentabilidade

Inovar e Criar Valor