Climate change and impact, ideas and background.

Hans Gulliksson

October 13th 2011, Tartu

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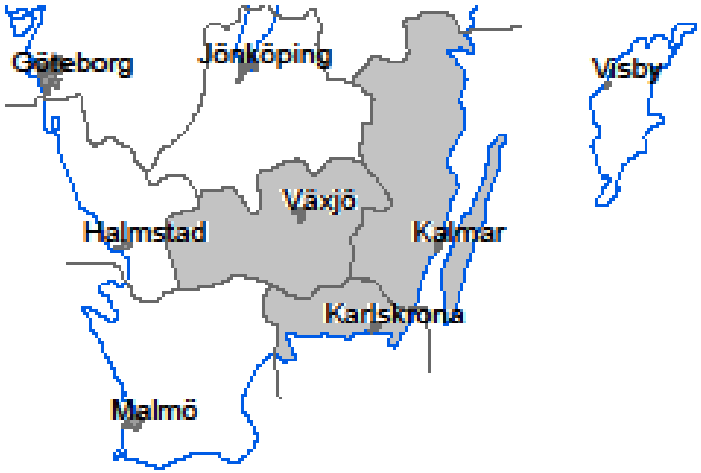
Energy Agency for Southeast Sweden





Buildings

- **Energy efficiency** decrease of needs and supply
- **Production of RES energy** wind-, hydro-, biomass and solar
- **Bioenergiy**

Transports

- **Sustainable travel** public transport and personal transport
- **Freight transports**
- **Fuels for vehicles** RES as biogas, ethanol, DME, Biodiesel

Learning and behaviour

- **Energy advisors**
- **Schools** training of teachers and pupils in workshops



Networks

- BiG- the bioenergy group in Vaxjo Ltd
- Bioenergycluster Smaland-Expo Vaxjo
- TransportEko Southeast Sweden
- Energy effciency in buildings in southeast
- Biogas southeast
- Solar in southeast
- Energy advisors in southeast
- Sustainable municipalities in southeast

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The Southeast of Sweden – one of a kind!

The southeast of Sweden is unique in Europe:

Large amount of RES,(Växjö, 56% of total energy use in 2009, county of Kalmar 48 % bioenergy),

District heating with woodchips, pellets and briquettes.

-residues from the forest industry.

Leading manufacturers of boilers and complete systems for biofuels.

Education in energy and environmental sciences

In close cooperation with leading companies in the region.

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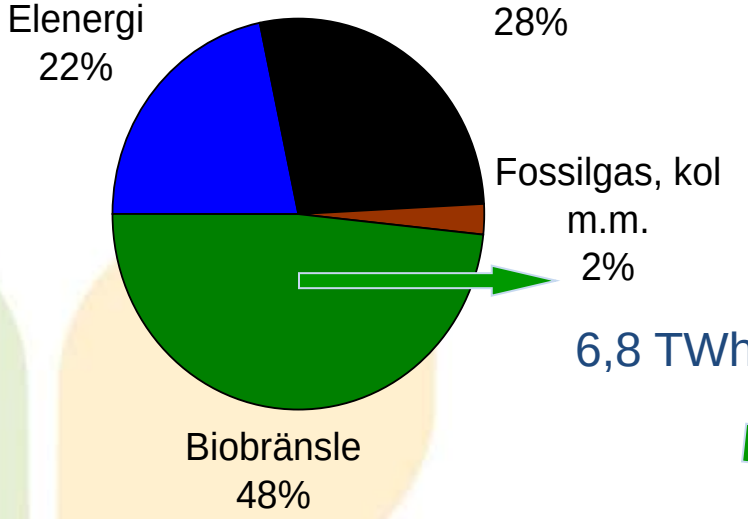
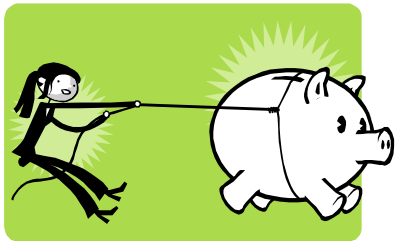
Energy as a economic driver in the region



Total 13,9 TWh

6,8 TWh

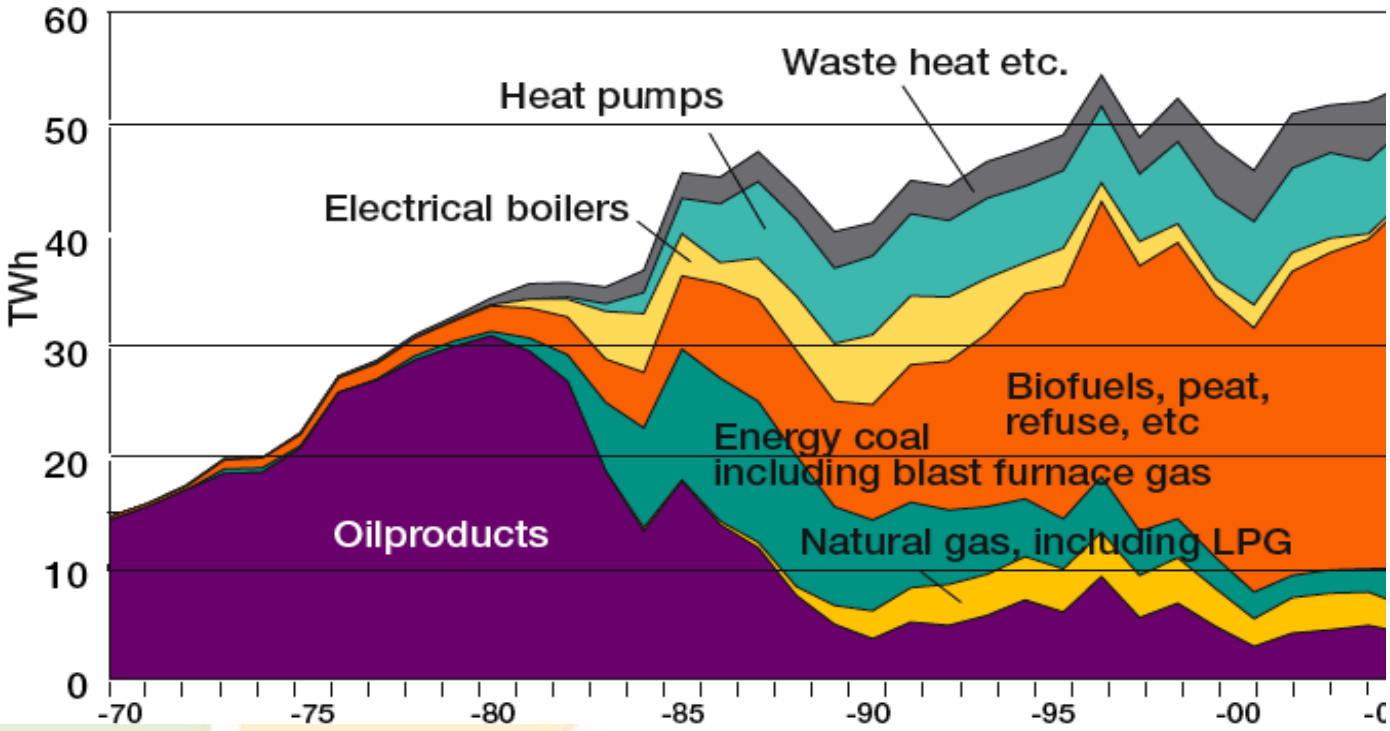
2.250 work



3.300 MSEK

”Regional energy economy”

Figure 26: Energy input for district heating, 1970–2004



Now > 60% bio fuels

Source: Swedish Energy Agency

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Forest biofuel management

Haulage/collection of forest residue.

Covered pile of forest residue is chipped for the heating season.

Chipping of forest residue.

Thinning near populated areas.

Stubs collected for crushing.

Bundling of forest residue.

Storage of composite residue logs.

Chips vehicle.

Spreading of ashes.

Forest residue (branches and tops), is collected at our timber felling areas and can be chipped directly, but is usually stored in piles near passable roads for transport to district heating plants during the heating season. It is beneficial to bring the ashes back to the forest.

Source: Swentec

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How to see and measure CO_2

- There is some ways to work with the CO_2 question
- Mainly it is to see the importance and handle linked to this.
- Support is given i.e. CoM, national rules and interest
- Some ideas are presented below

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Methods

- inventories EMEP-CORINAIR or IPCC for CO_2 measurement
  - very complex
  - highly regulated
  - official
- carbon footprints
  - more or less complex
  - many methods
  - freely developed by many organizations
- life cycle assessments
  - more scientific
  - many methods

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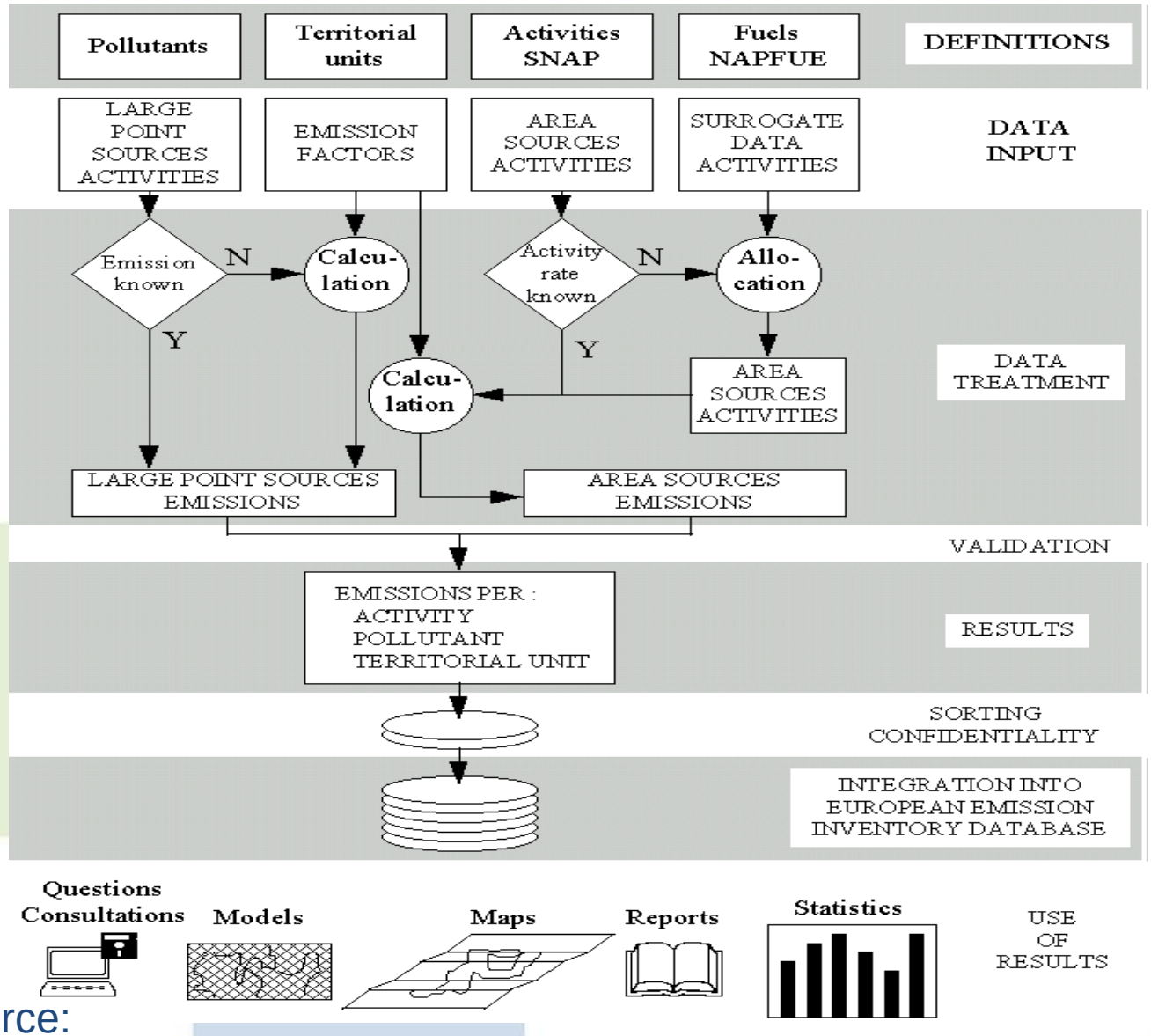
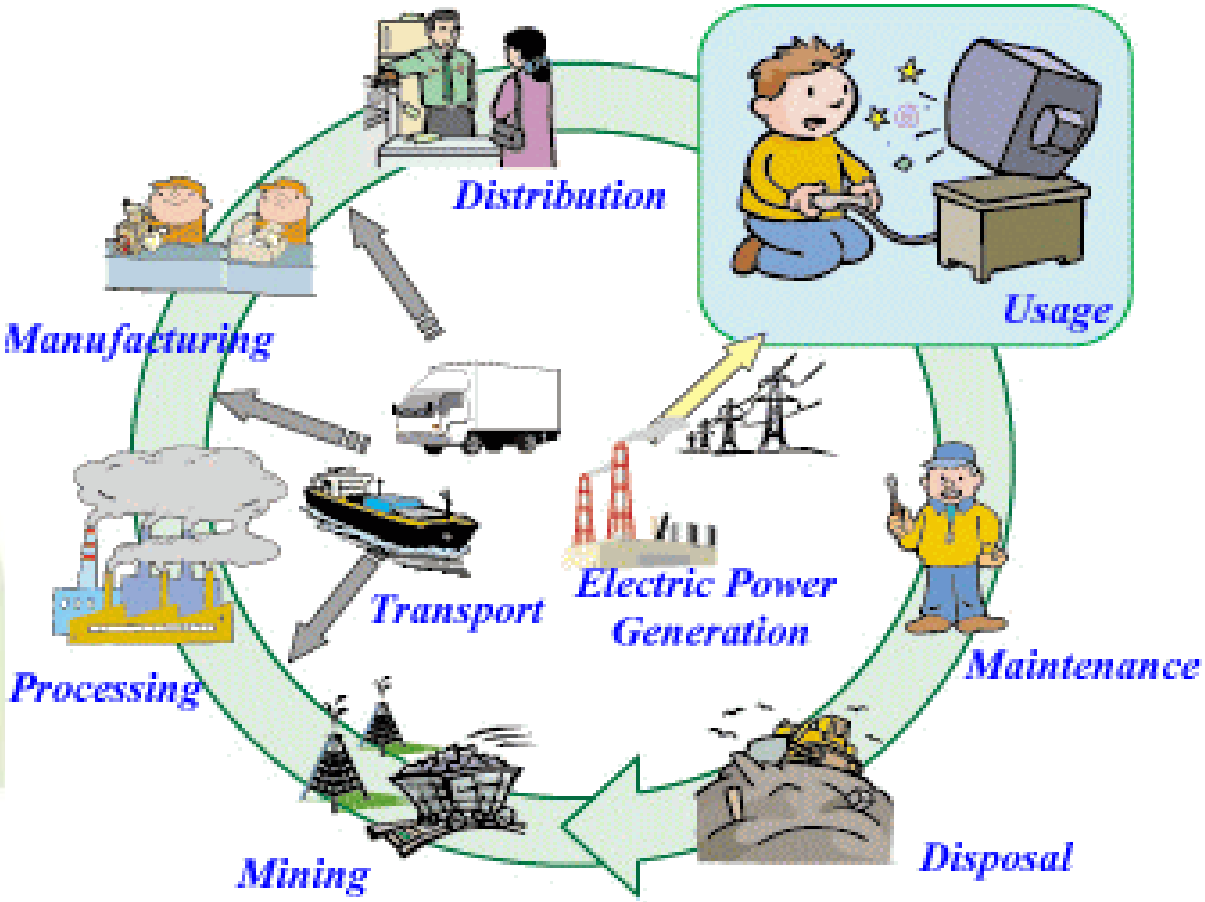
Figure 1 - Structure of CORINAIR 90 system



source:
www.eea.europa.eu/publications/92-9167-033-2/image116.gif

LCA is very accurate



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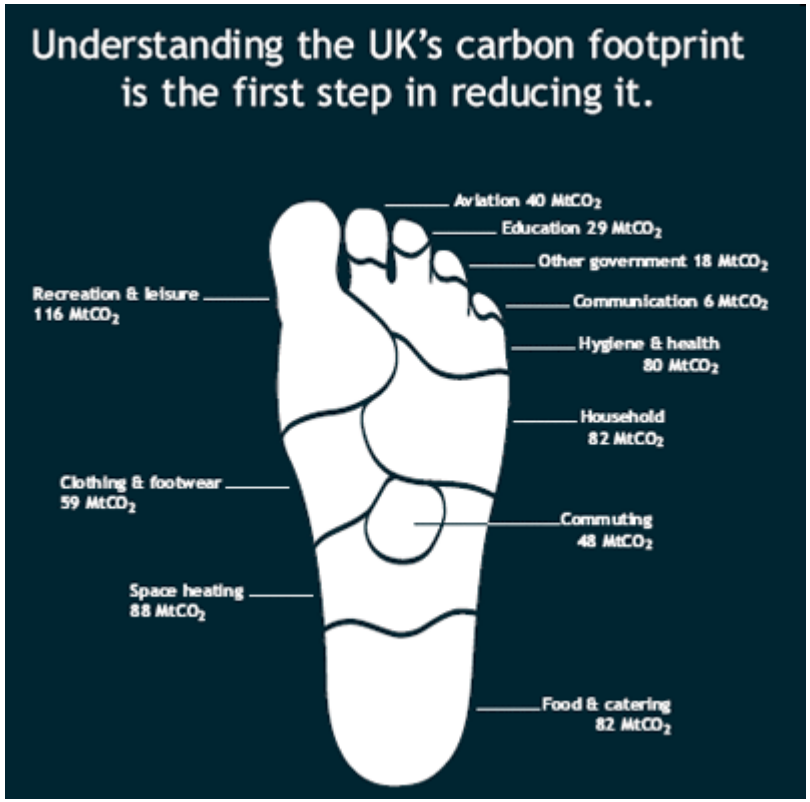
footprints are more fun



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Sources of GHGs from a project work

- hardware purchase
- travel and accomodation
- events and meetings
- brochure and report printing
- computer use (emails, document exchange)
- printing and photocopies
- …

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Examples of approx. GHG emissions

- 1 roundtrip flight across Europe, 1 stop
  - **500 kg CO_2**
- 1 laptop computer
  - **90 kg manufacturing + 40 kg/year usage**
- laser printing
  - **30 g/sheet (3 kg for 1 report of 100 pages)**

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Events and Meetings CO2 Calculator

--> Use this form when You Input Data in Kilometers

Total CO2(t) arising from event	10.159
CO2(kg) per delegate	376.278

Basic information

No of delegates and staff		27
Duration in days		1.5
No. guest nights		11

Travel

Mode of transport	Km	Miles	CO2 (t)
Petrol car	1	0.621	0.00021
Diesel car	80	49.710	0.01591
Petrol hybrid car	1	0.621	0.00017
Motorbike	1	0.621	0.00011
Train (national)	2572	1598.167	0.15342
Train (underground)	1	0.621	0.00005
Bus	1	0.621	0.00009
Air (within UK)	1	0.621	0.00034
Air (within Europe)	32712	20326.294	9.10618
Air (outside Europe)	1	0.621	0.00023
Travel sub total	35371.00	21978.520	9.27670

Accommodation

No. guest nights	CO2 (t)
11	0.41206
Accommodation sub total	0.41206

Meeting venue

Floor space used (m2)	100.44	
Duration in days	1.5	CO2 (t)
Electricity used (kWh)	61.92126	0.02663
Gas used (kWh)	189.8316	0.03911
Meeting venue sub total		0.06573

Waste

No. delegates	Duration in days	CO2 (t)
27	1.5	0.40500
Waste sub total		0.40500

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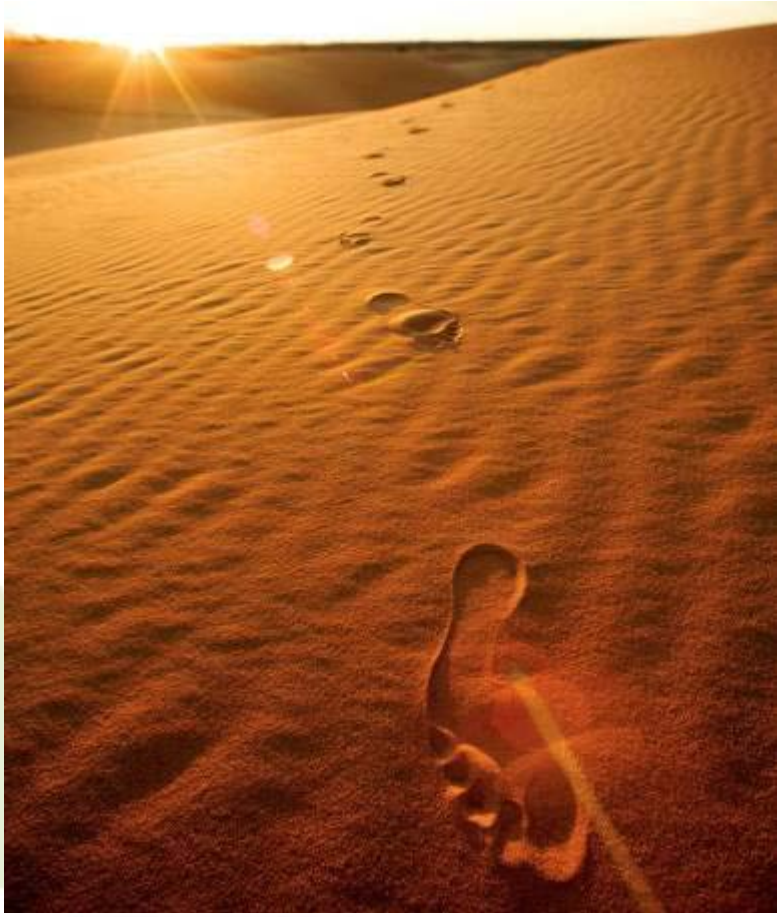
The Ecological Footprint



- **A metaphor for our impact on nature**
- **A measure of how many hectares of biologically productive area that are needed to produce everything we consume and absorb the waste**

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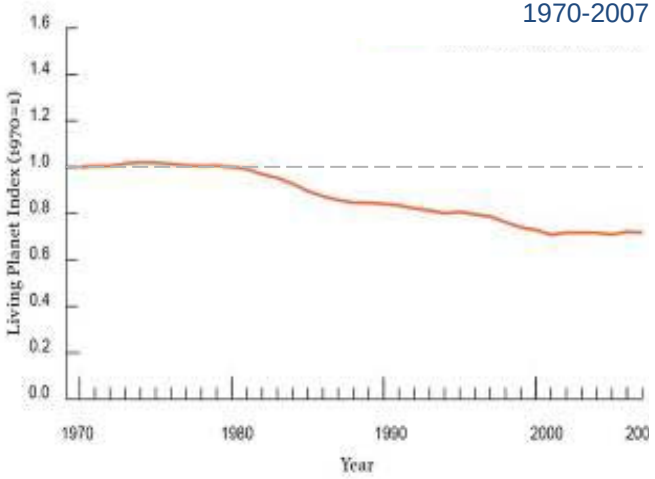
Two trends going the wrong way

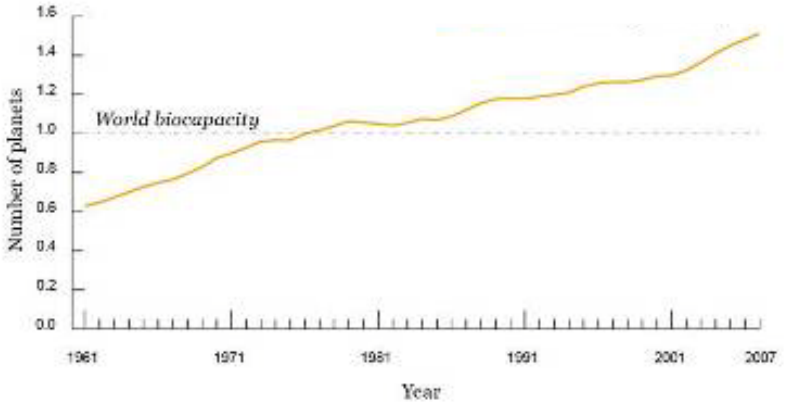
LIVING PLANET INDEX, GLOBALLY

1970-2007



MANKIND'S ECOLOGICAL FOOTPRINT

1961-2007



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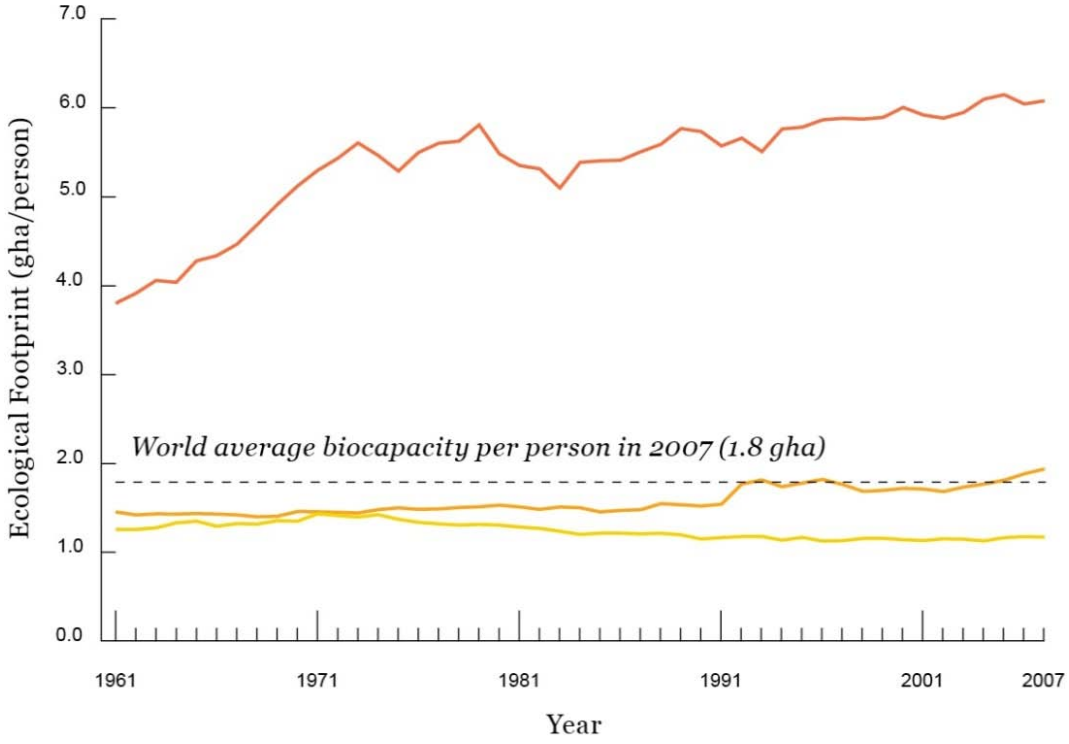
Rich countries have larger ecological footprints than poor

Change of ecological footprint in high, middle and low income countries (1961-2007)



Source: WWF, Living Planet Report 2010

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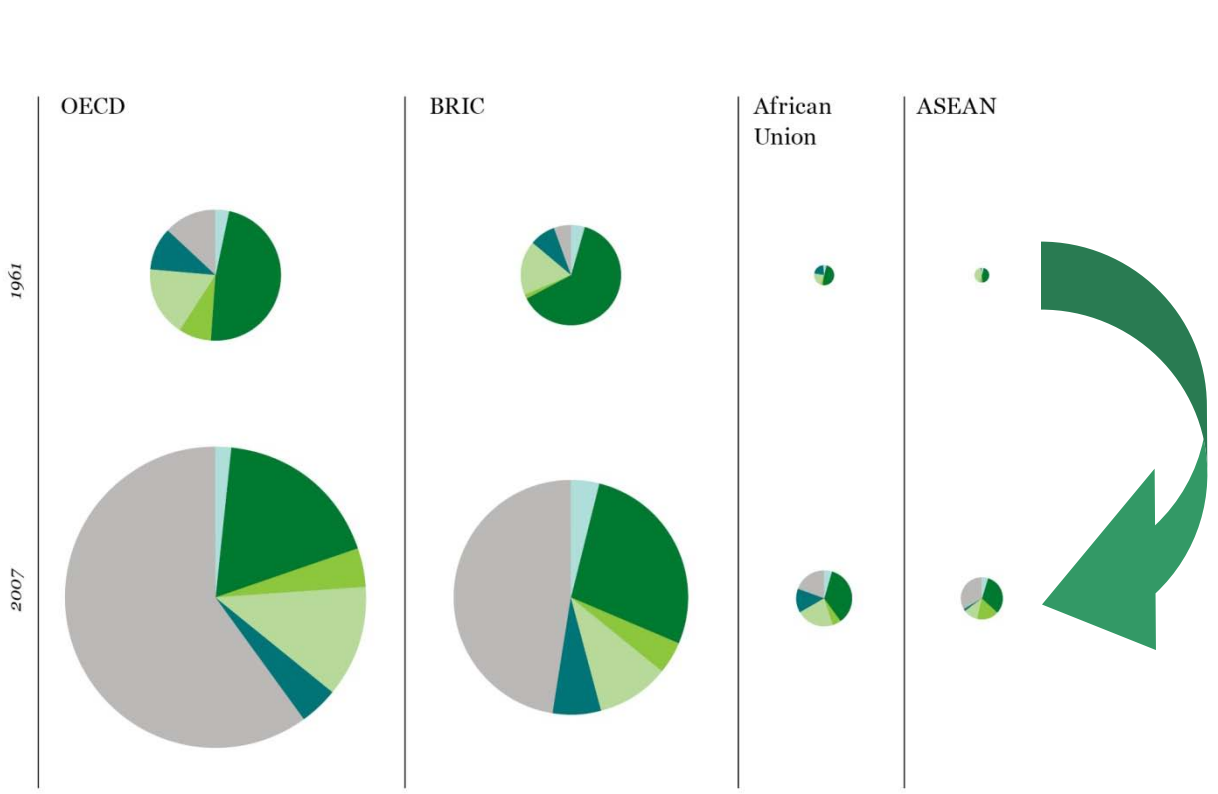
Demand for natural resources increases all over the world

Change of relative size and composition of the total ecological footprint from different groups of countries (1961-2007)



Carbon footprint for ASEAN countries increased a 100 times

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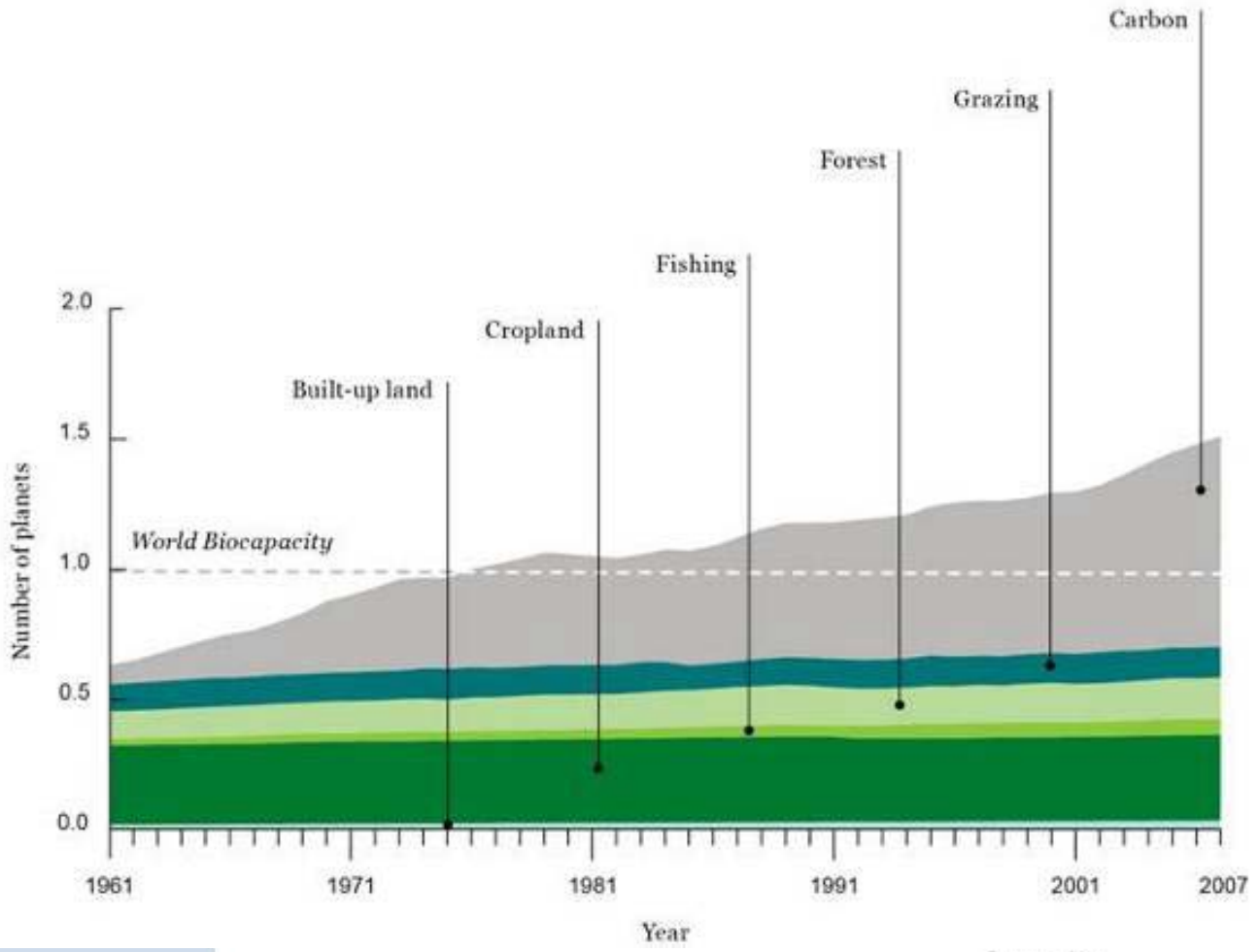
Carbon dioxide emissions have increased by 11 since 1961

Mankind's ecological footprint divided into components (1961-2007)



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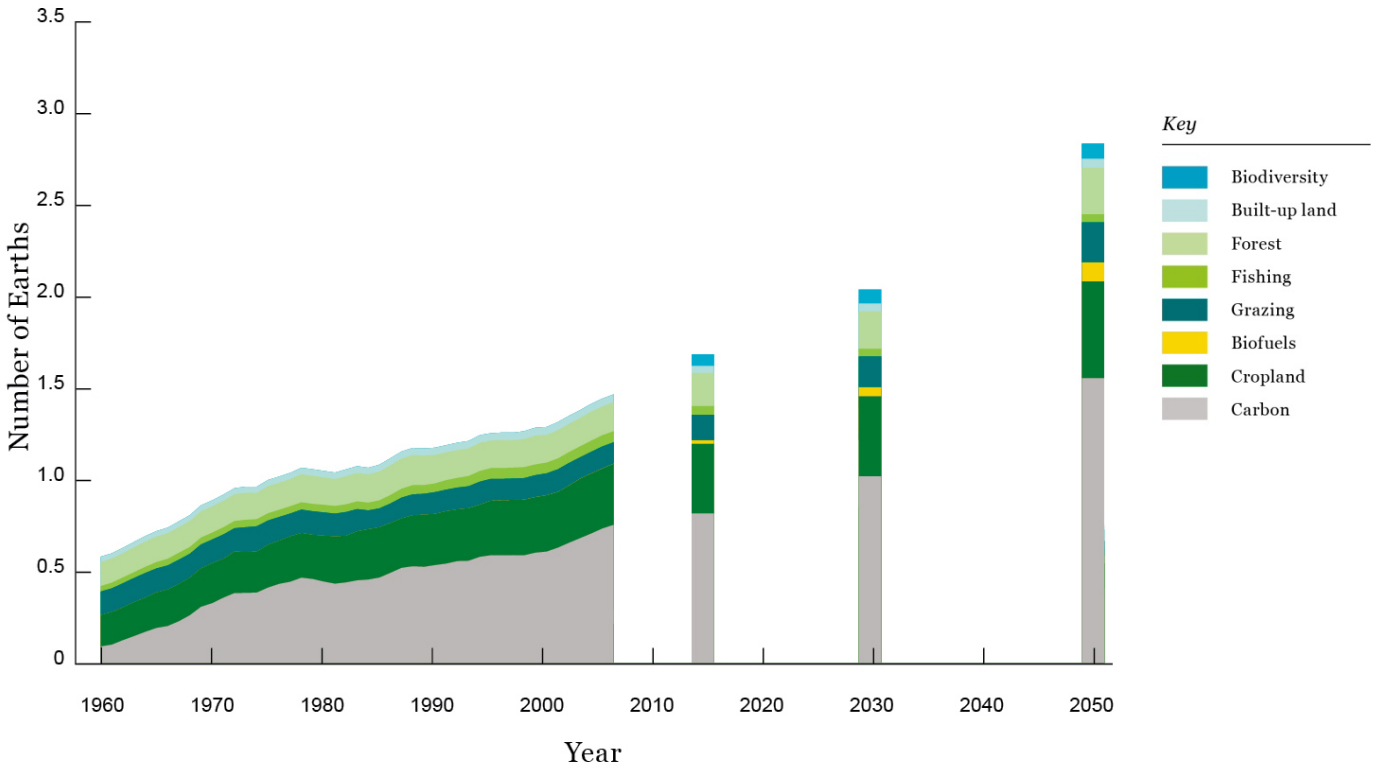
Future scenario 1: “Business as usual and nothing is changed”



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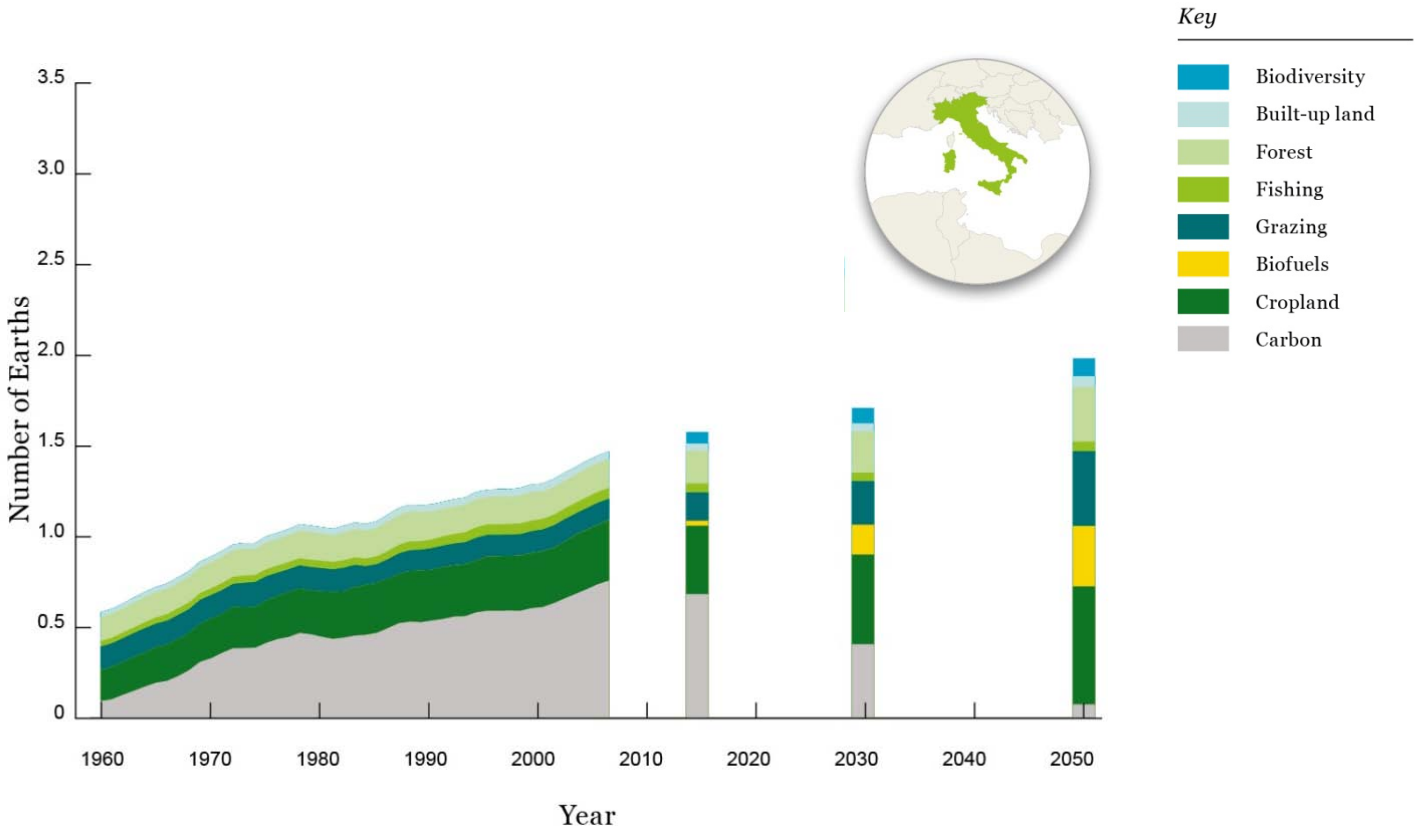
Future scenario 2: “With renewable energy and Mediterranean food”

Scenario for the Ecological Footprint based on 95% renewable energy with a global average diet like the Italian



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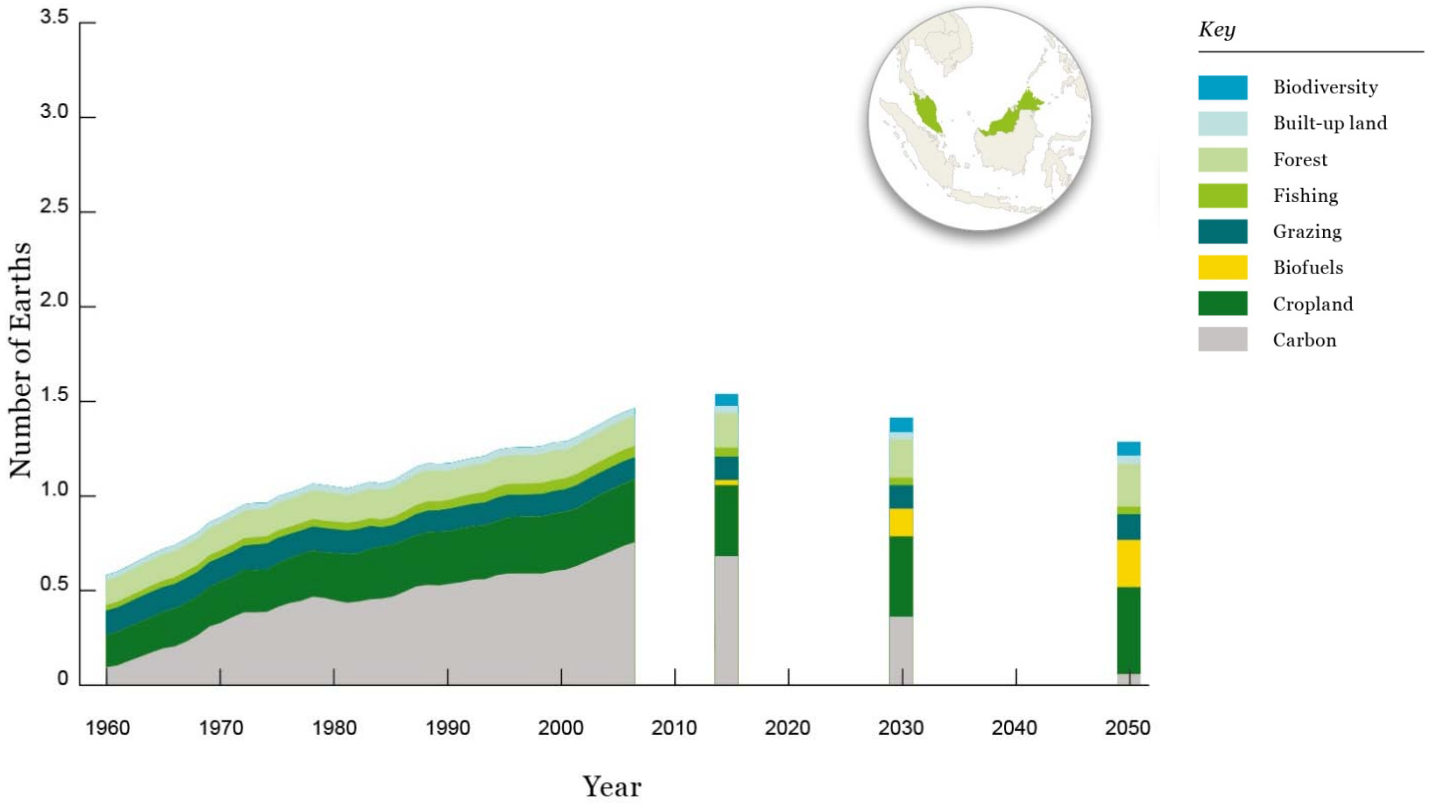
Future scenario 3: “With more renewable Energy and a more vegetarian diet”

Scenario for the Ecological Footprint based on 95% renewable energy with a global average diet like the Malaysian



Source: WWF, Living Planet Report 2010

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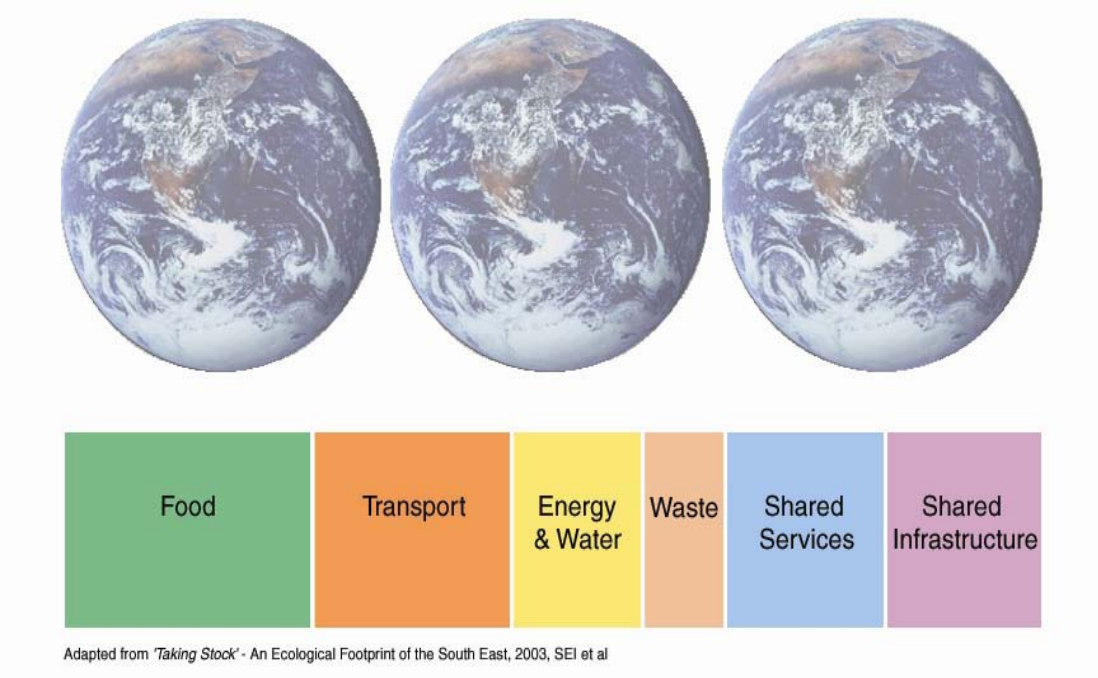
If everyone lived as we do …



Adapted from *'Taking Stock'* - An Ecological Footprint of the South East, 2003, SEI et al

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A good life for everyone is only possible if we learn to live on

One Planet

Adapted from "Taxing Stock" – An Ecological Footprint of the South East, 2003, SEI et al

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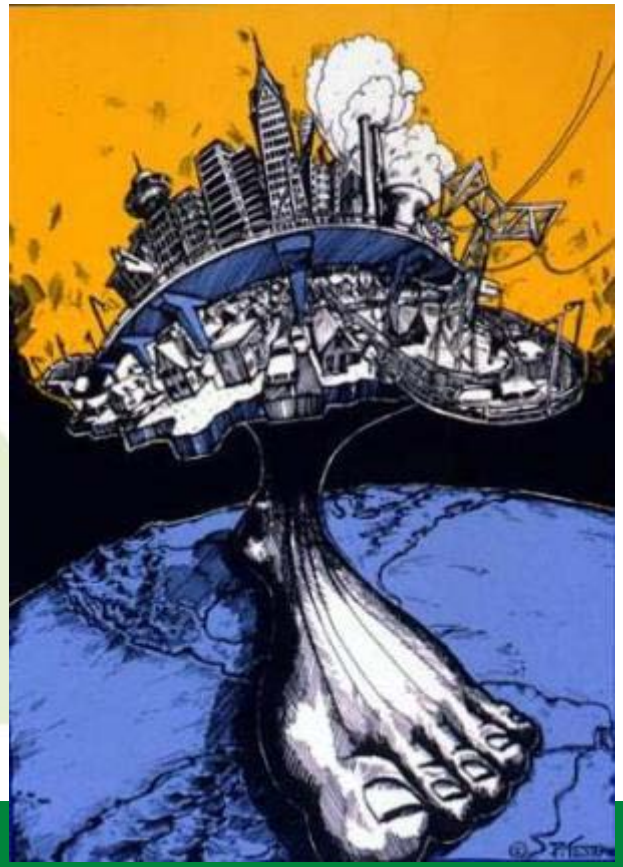
We absolutely must and can build cities where sustainable consumption is easy



- **Cities bring together actors with the power to change here and now**
- **Cities have a large creative and innovative potential**
- **The urban context makes social and technical innovations that radically decreases the ecological footprint possible**


www.StrangeDangers.com

Contact information

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Thank you

ENNEREG - Regions paving the way for a Sustainable Energy Europe is supported by the Intelligent Energy - Europe programme under Contract No: IEE/09/250.661/S12.558228