Presented at

Auroville
Green Practices

Seminar and Site Visits
26-28 August, 2010

Sustainable Energy Systems

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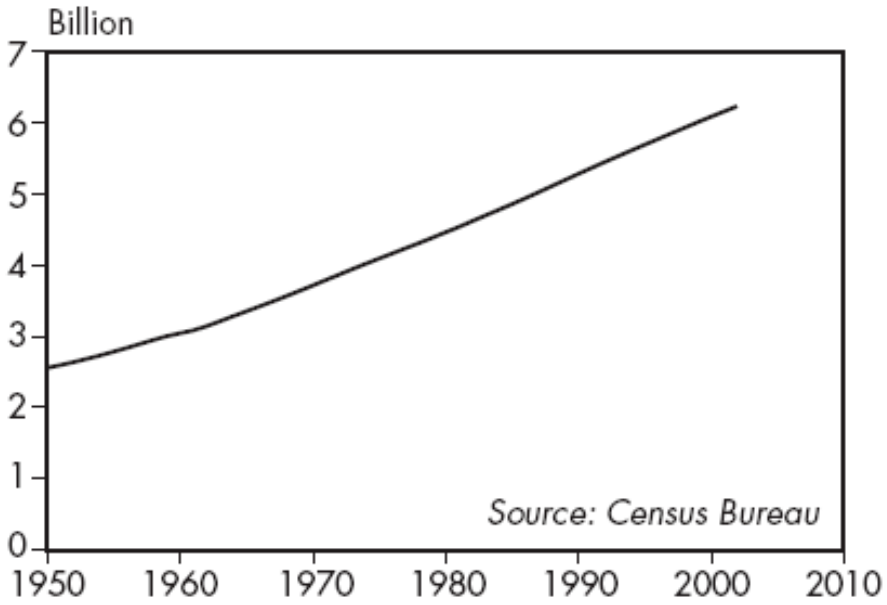
Why Sustainable Energy Systems?

1. Limited quantity of Fossil Fuels;
2. Energy security (local instead of centralised / external systems)
3. Global warming (fossil fuel burning = carbon dioxide concentrations rising = carbon dioxide increasing the greenhouse effect = increasing average global temperatures)
4. Pollution of the environment

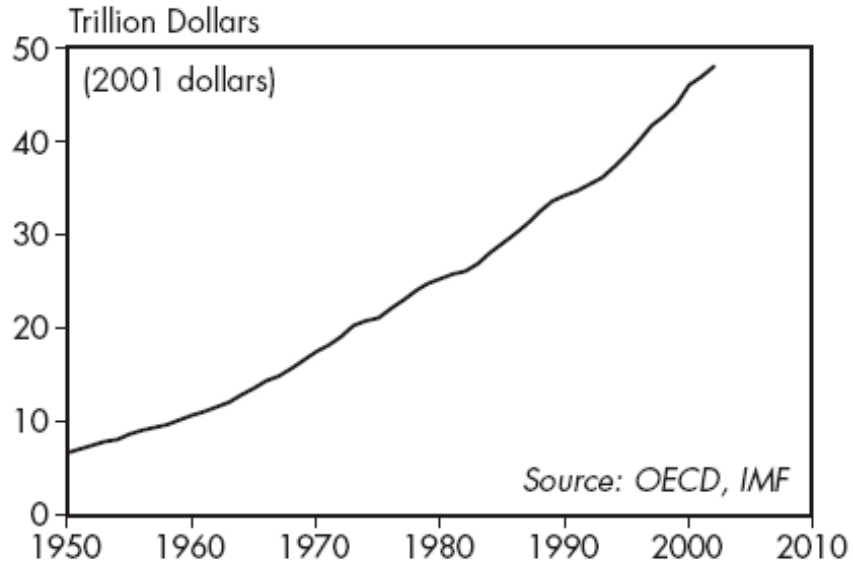
World population

Source: World Watch Institute



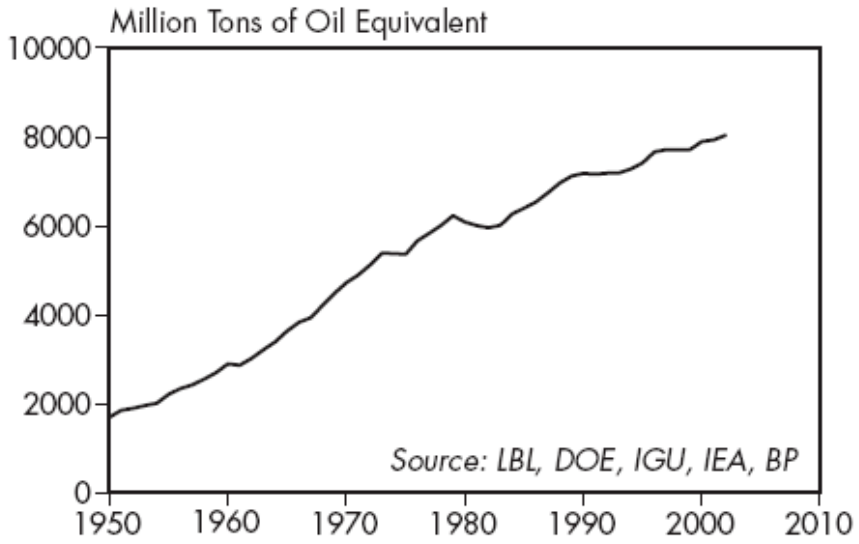
Gross World Product

Source: World Watch Institute



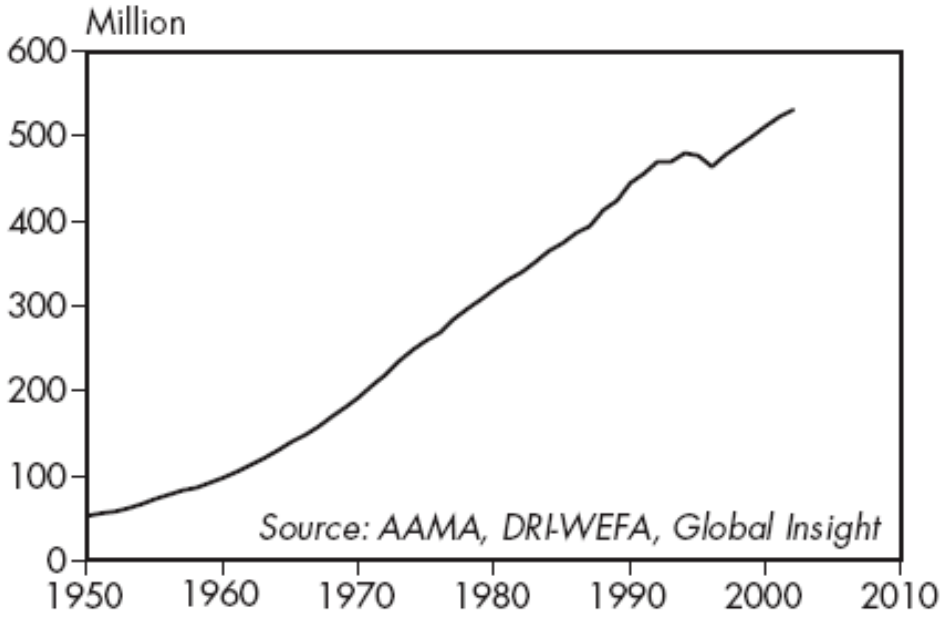
World fossil fuel consumption

Source: World Watch Institute



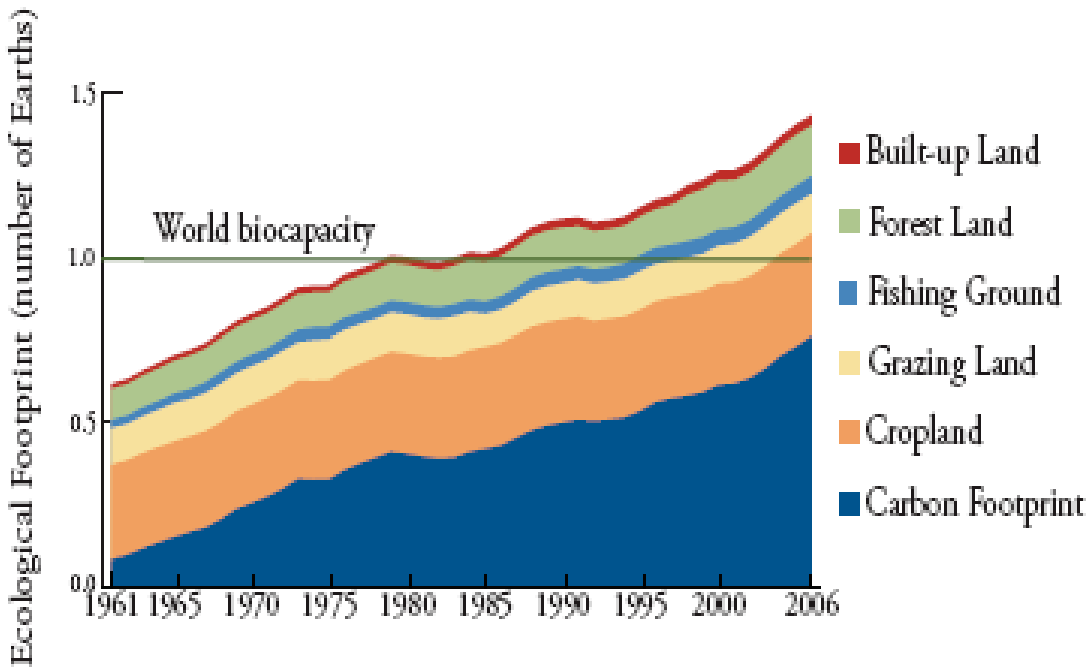
World passenger car fleet

Source: World Watch Institute



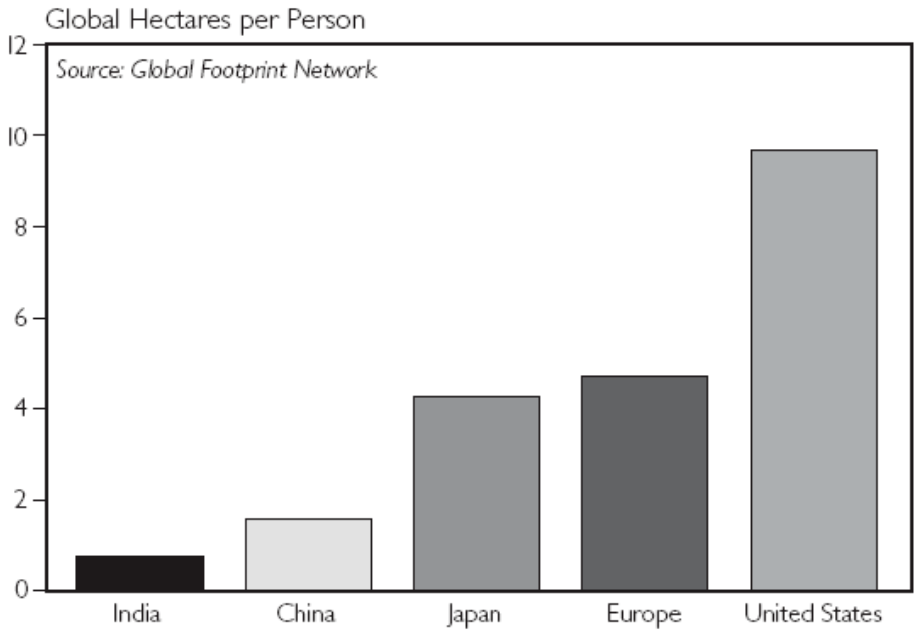
Global Footprint

Source: Global Footprint Network

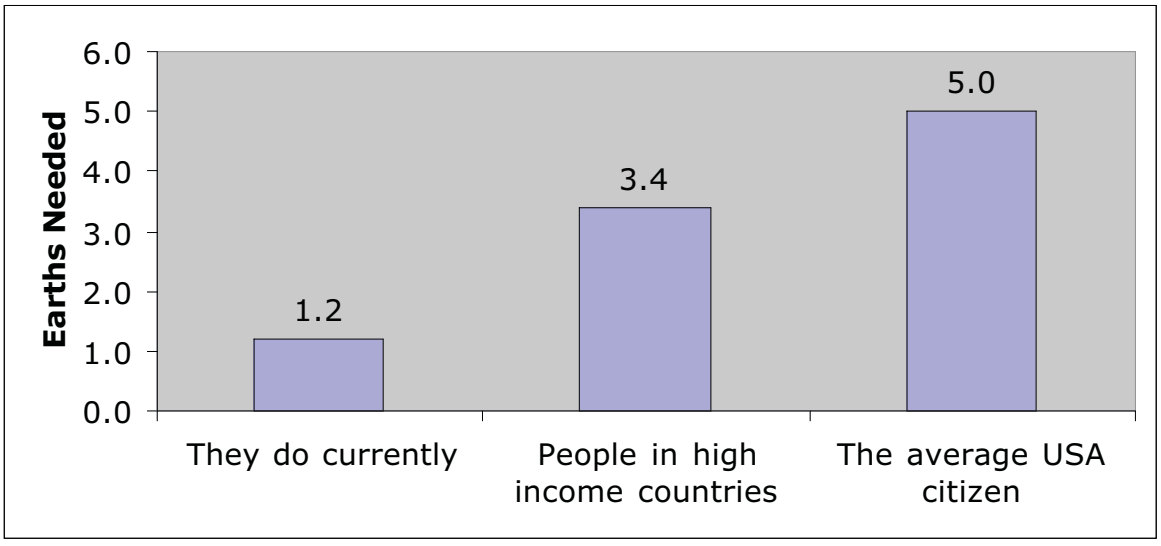


Global Hectares per person

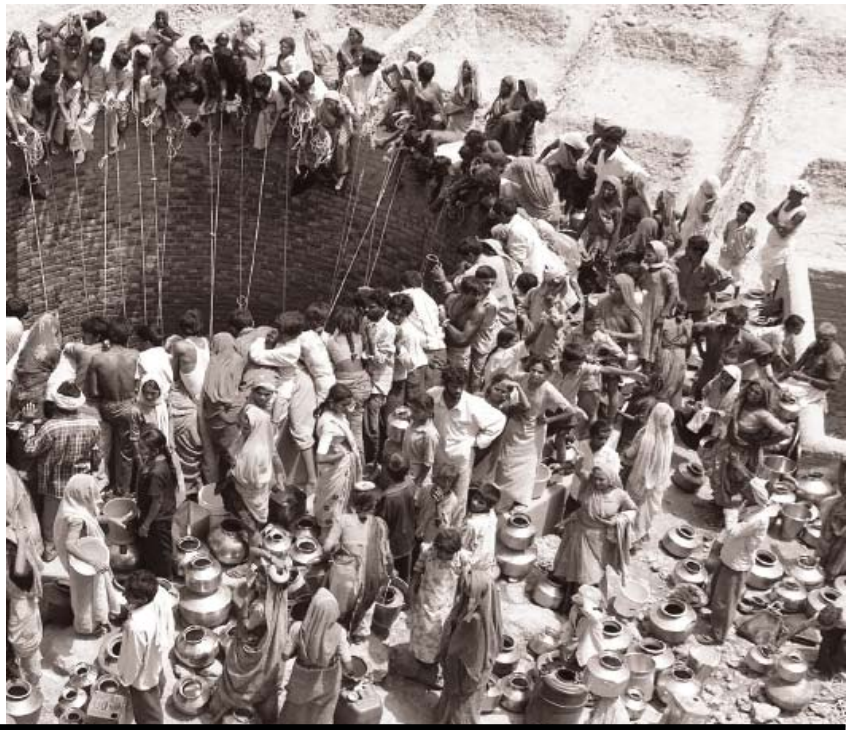
Source: World Watch Institute



Number of earths needed if everyone consumed like. . .

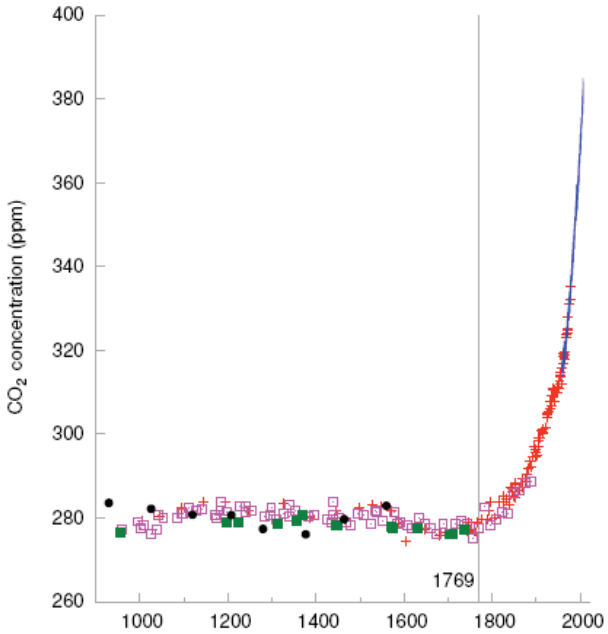


Not to speak of...the water crisis.....



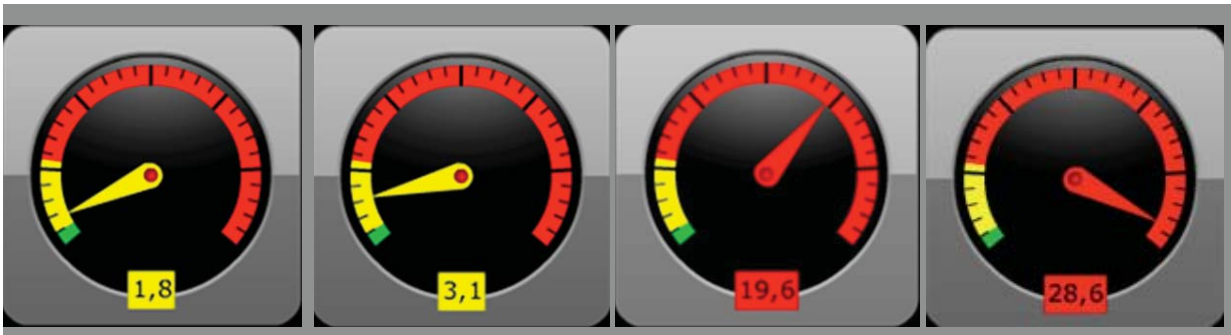
Carbon dioxide (CO2) concentrations (in parts per million) for the last 1100 years

Source: David JC MacKay



Carbon Footprints

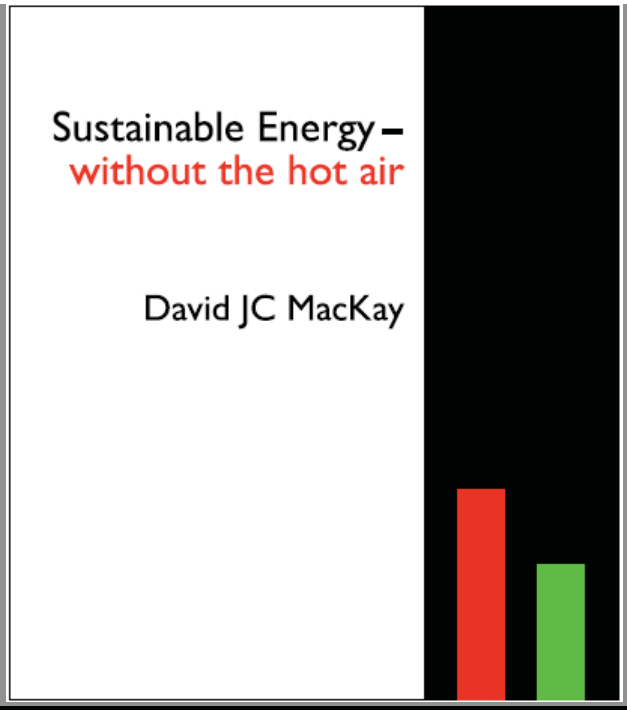
Source: www.carbonfootpintofnations.com / Norwegian University of Science and Technology



India China Canada USA

(tonnes CO_2 – equivalents per capita)

"Can we *conceivably* live sustainably?"



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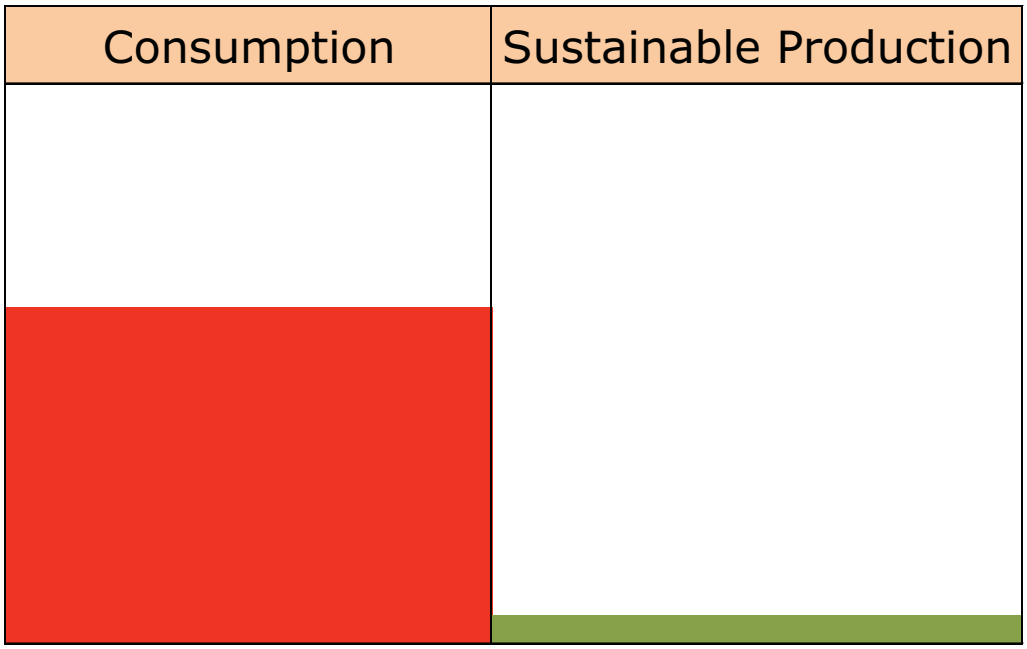

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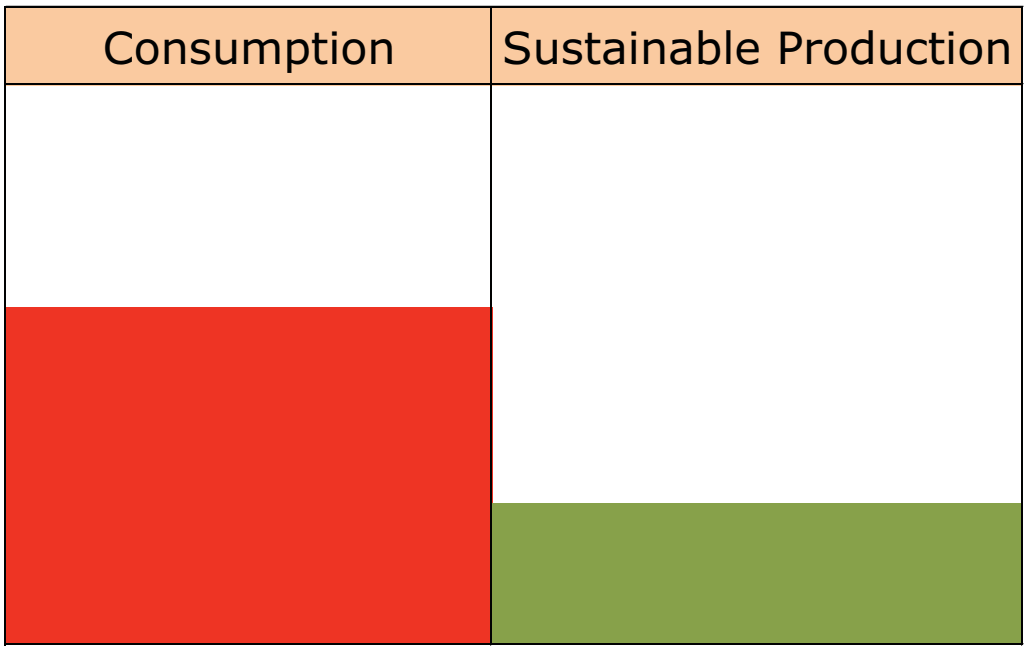

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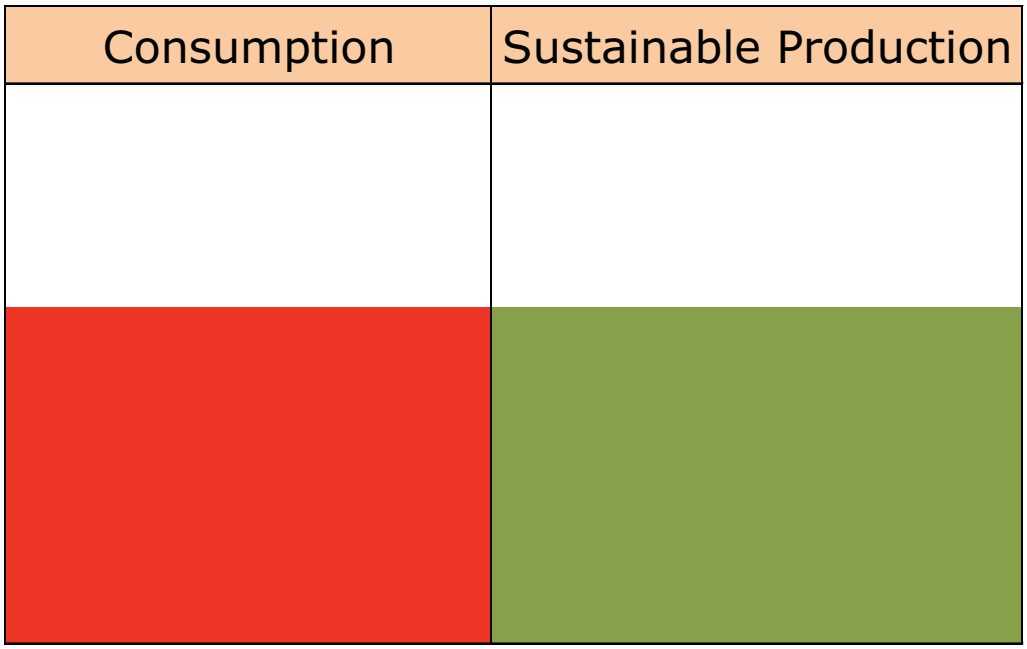


Power (W) and Energy (Wh)

One kilowatt = 1000 watt (watt is a unit to measure power named after James Watt)

One kilowatt-hour (kWh) = 1000 watt used for one hour or 250 W for 4 hours or 100 watt for 10 hours etc. (kWh is unit to measure energy. Energy = power x time)

One kilowatt-hour is also known as “one unit” in the context of electricity meter readings

For the calculations we use kWh per person per day (kWh / p / d)

Energy Consumption

Source: David JC MacKay -in kWh/p/d


Cars 40


Air travel 30


Lighting 4


Gadgets 5


Appliances 37


Food 15

Goods 60


Public 4

Renewable Energy Generation

-in kWh/p/d


Photo-voltaic 50


Solar thermal 13


Solar biomass 24


Hydro 1.5

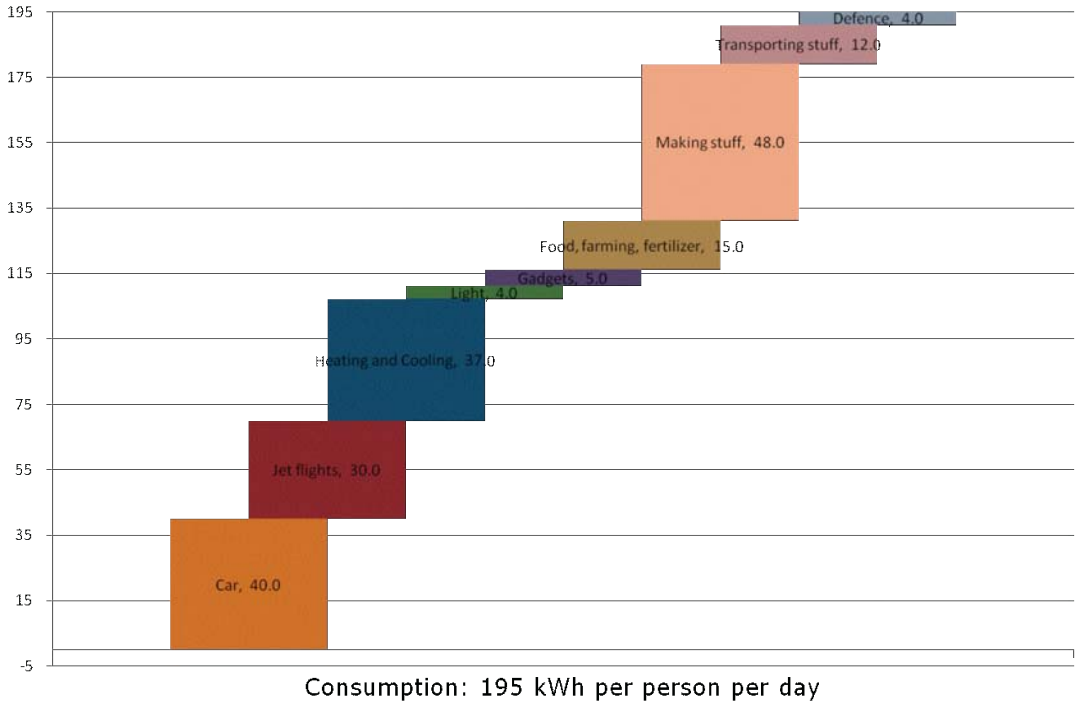

Offshore wind 48


Waves/tides 15


Wind 20

Energy Consumption stacked up

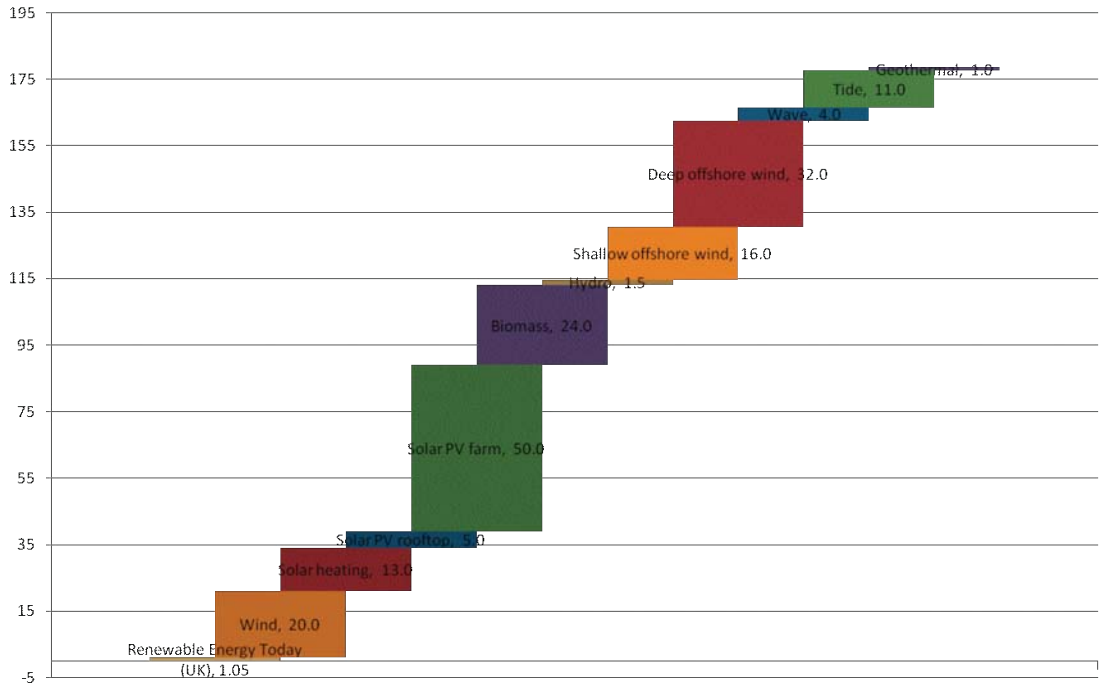
Source: David JC MacKay



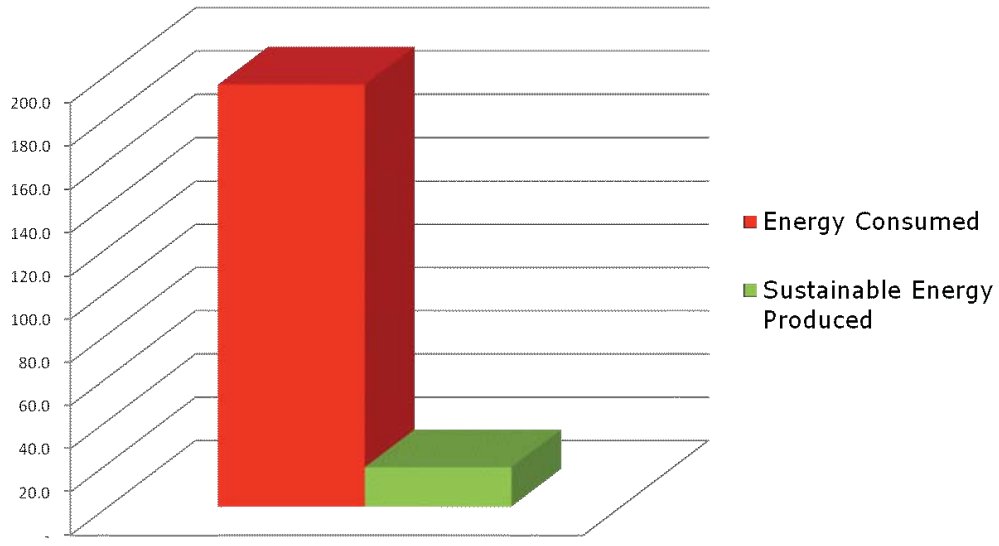
Consumption: 195 kWh per person per day

Renewable Energy Production stacked up

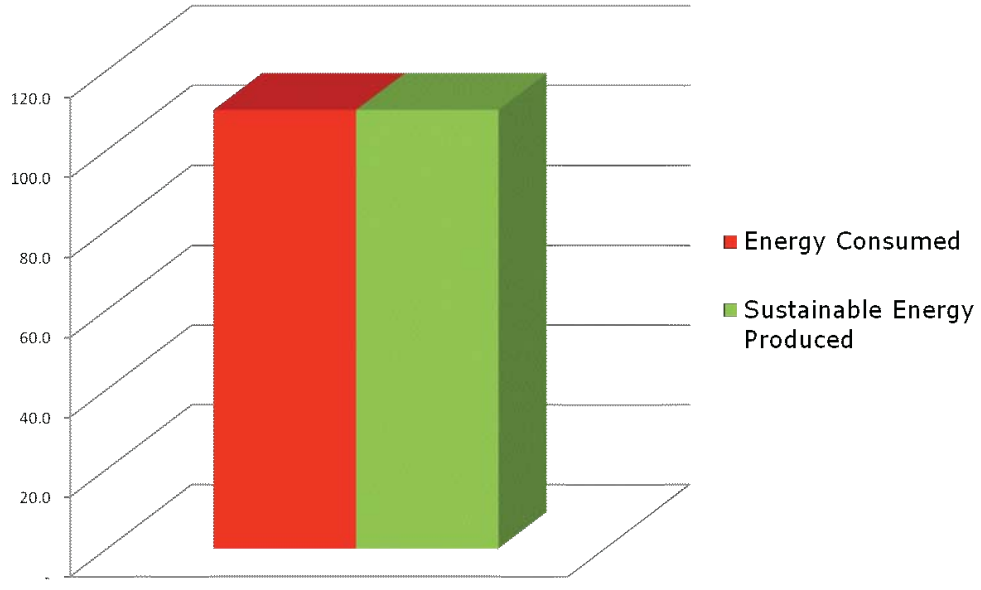
Source: David JC MacKay



The Energy Balance – Realistic (now)

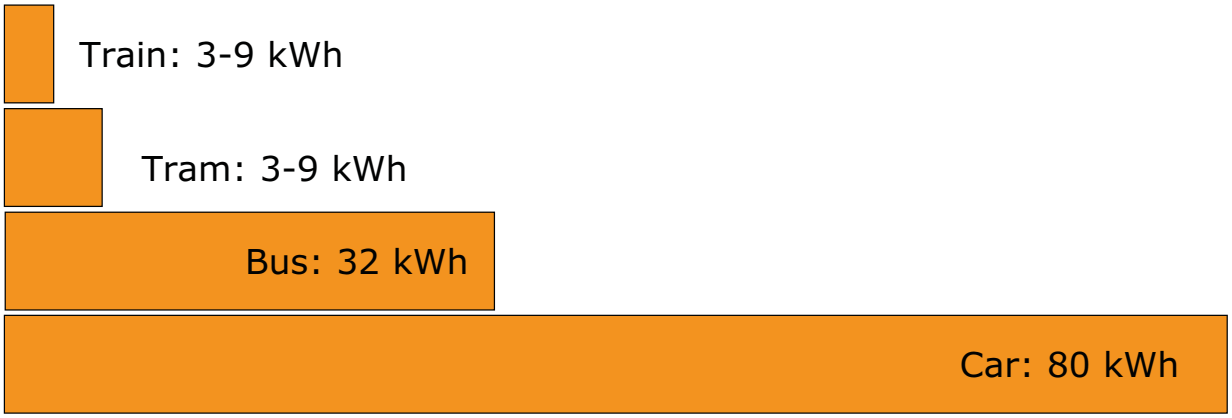


How to get there?



Energy Efficiency and Mobility

Source: David JC MacKay per passenger/100km



Better Heating and Cooling

Insulation of buildings

Heat pumps

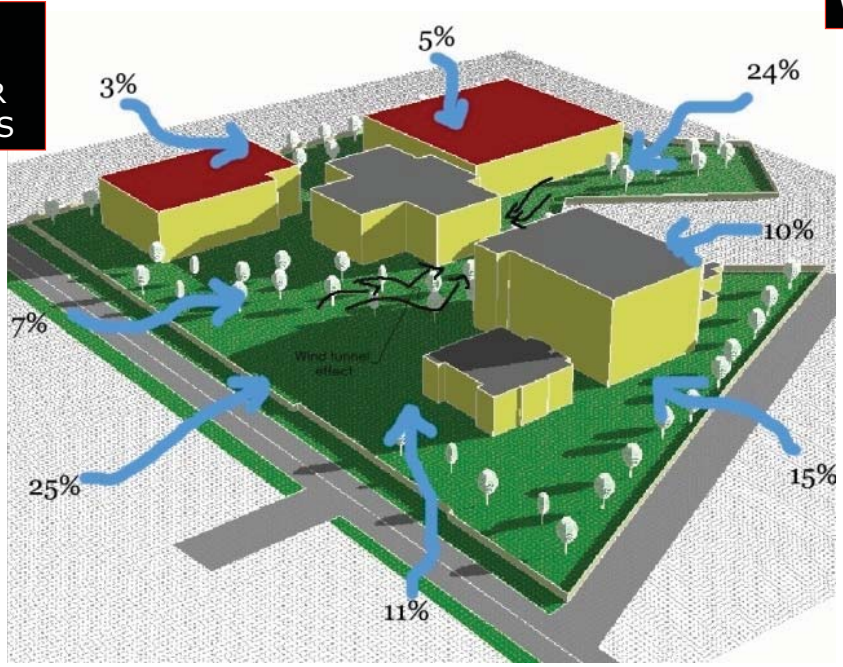
Change your thermostat settings

Designing Green Buildings

Courtesy: Mcd Berl, Bangalore

SHADE ANALYSIS NEIGHBOR BUILDINGS

WIND



MW-size Solar Plants

Seville, Spain: 31 MW

Rooftop solar – in a big way

Renewable Energy installations will have to become…

Country – size…

Renewable Energy in Auroville

Auroville Energy Vision (draft)

In Auroville energy will be consumed as a means to achieve a higher level of collective consciousness rather than for the fulfillment of personal desires and comforts.

Auroville will be a township that consumes energy only from sustainable energy sources.

To the extent that Auroville uses energy from non-sustainable sources for the building of the town, surplus sustainable energy shall be produced to compensate for such consumption.

A change of consciousness and the transformation of matter are essential to achieve ultimate integral sustainability.

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green.aurovilleportal.org