

European Environment Agency



# Environmental impacts of European consumption

## Responsible consumption, energy saving and climate change

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Trainers training meeting of the e-Cons Network  
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# Topics we will cover today

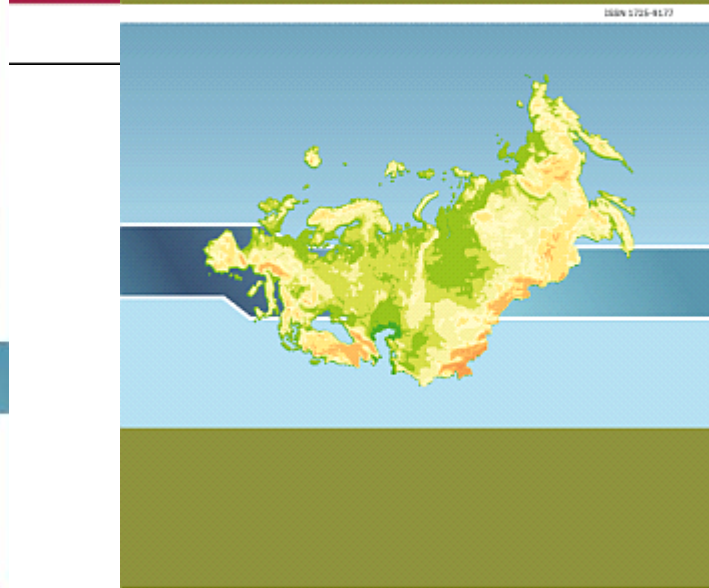
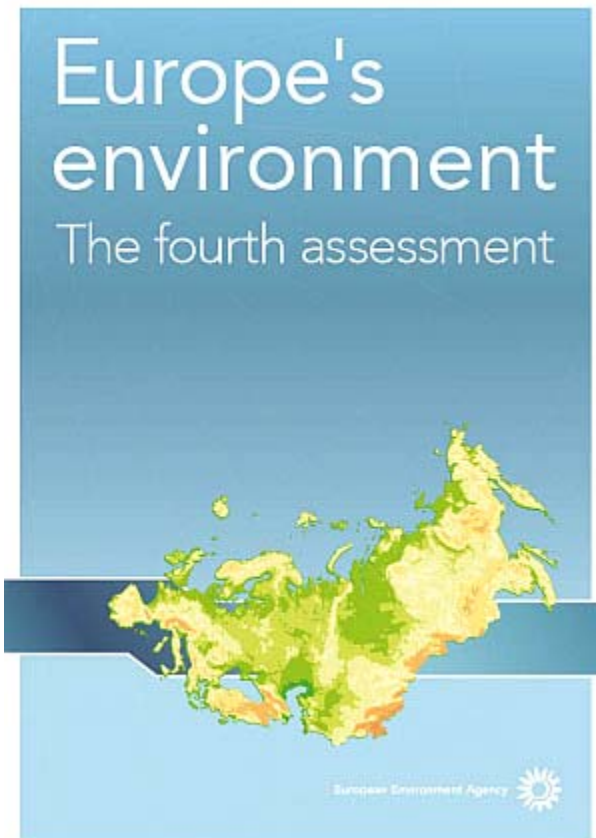
- Energy use and energy efficiency – what is happening ?
- Use of natural resources in production – are our economies becoming more productive ?
- Consumption in households – just how important is it?
- Transport, food and housing – most important areas of consumption
- The REALLY big challenge of climate change.
- Changing the way we plan our environmental policies
- Will progress in technology solve the problem ?

# About the European Environment Agency

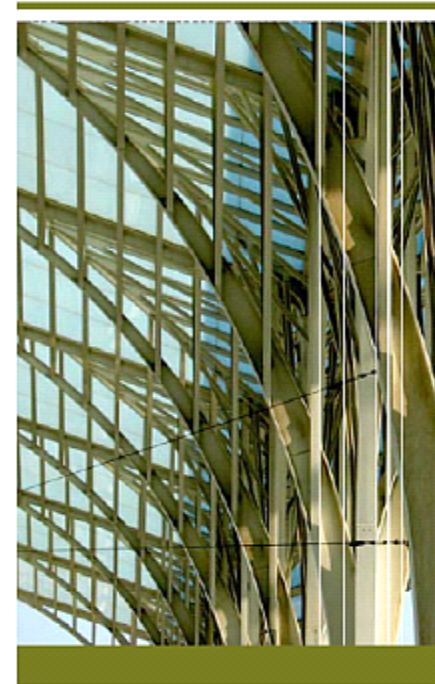
- Specialised EU institution established in 1994, located in Copenhagen
- 32 member countries (27 from the EU) and 6 cooperating countries
- Provide environmental information and knowledge to policy makers and the public
- Dedicated unit on Sustainable Consumption and Production since 2006
- Support from the European Topic Centre on Sustainable Consumption and Production
- Examples of ongoing projects:
  - SCP indicators
  - Driving forces of consumption patterns
  - SCP factsheets



## Recent EEA work on sustainable consumption and production



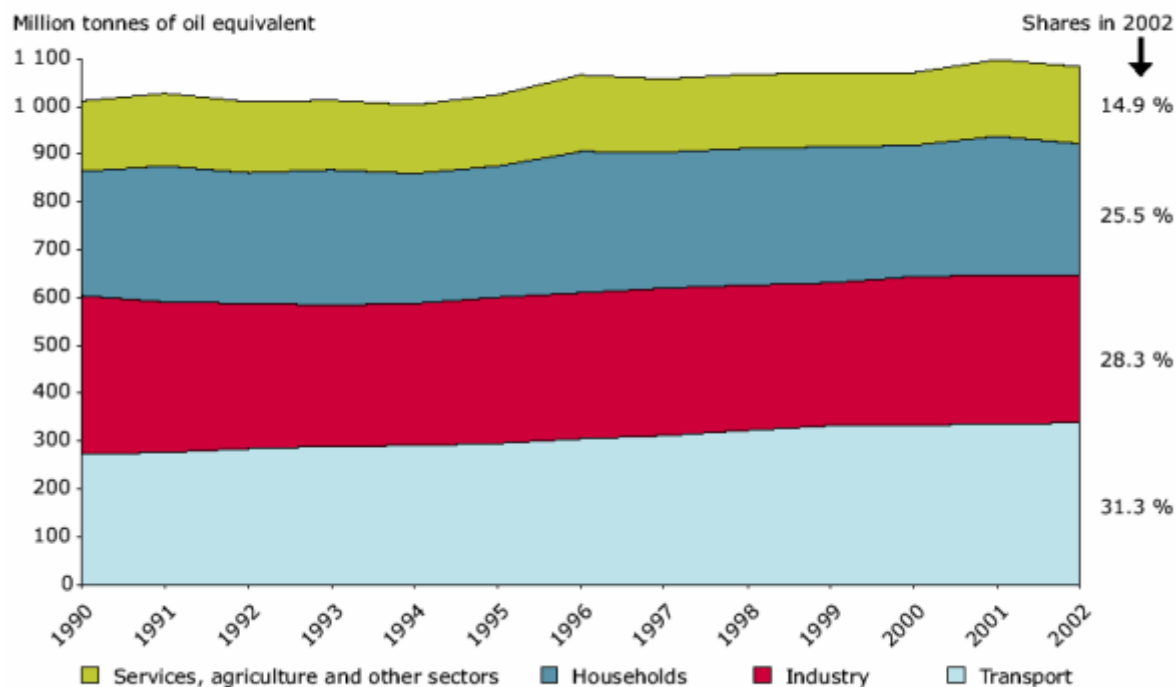
### Environmental pressures from European consumption and production Insights from environmental accounts



Everything can be downloaded from [www.eea.europa.eu](http://www.eea.europa.eu)

# Are we decreasing our use of energy ?

**Figure 1** Final energy consumption by sector, EU-25



**Note:** Data source: Eurostat (Ref: [www.eea.eu.int/coreset](http://www.eea.eu.int/coreset)).

Final energy consumption in the EU-25 increased by about 8 % over the period 1990 to 2002.

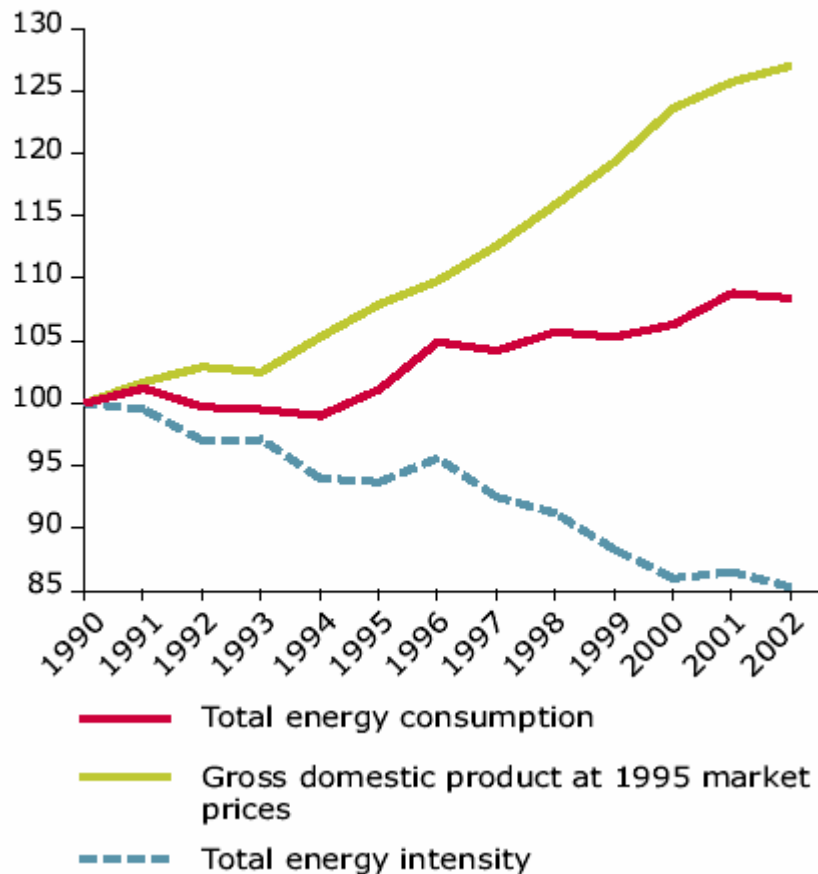
Transport has been the fastest-growing sector since 1990 and is now the largest consumer of final energy.

Energy consumption by services (including agriculture) and households grew by 10.2 % and 6.5 % respectively while final energy consumption in the industry sector fell by 7.7 % over the same period.

# Are we using energy more efficiently ?

**Figure 1 Total energy intensity, EU-25**

Energy intensity index 1990 = 100



Economic growth is requiring less additional energy consumption, mainly as a result of structural changes in the economy. However, total energy consumption is still increasing

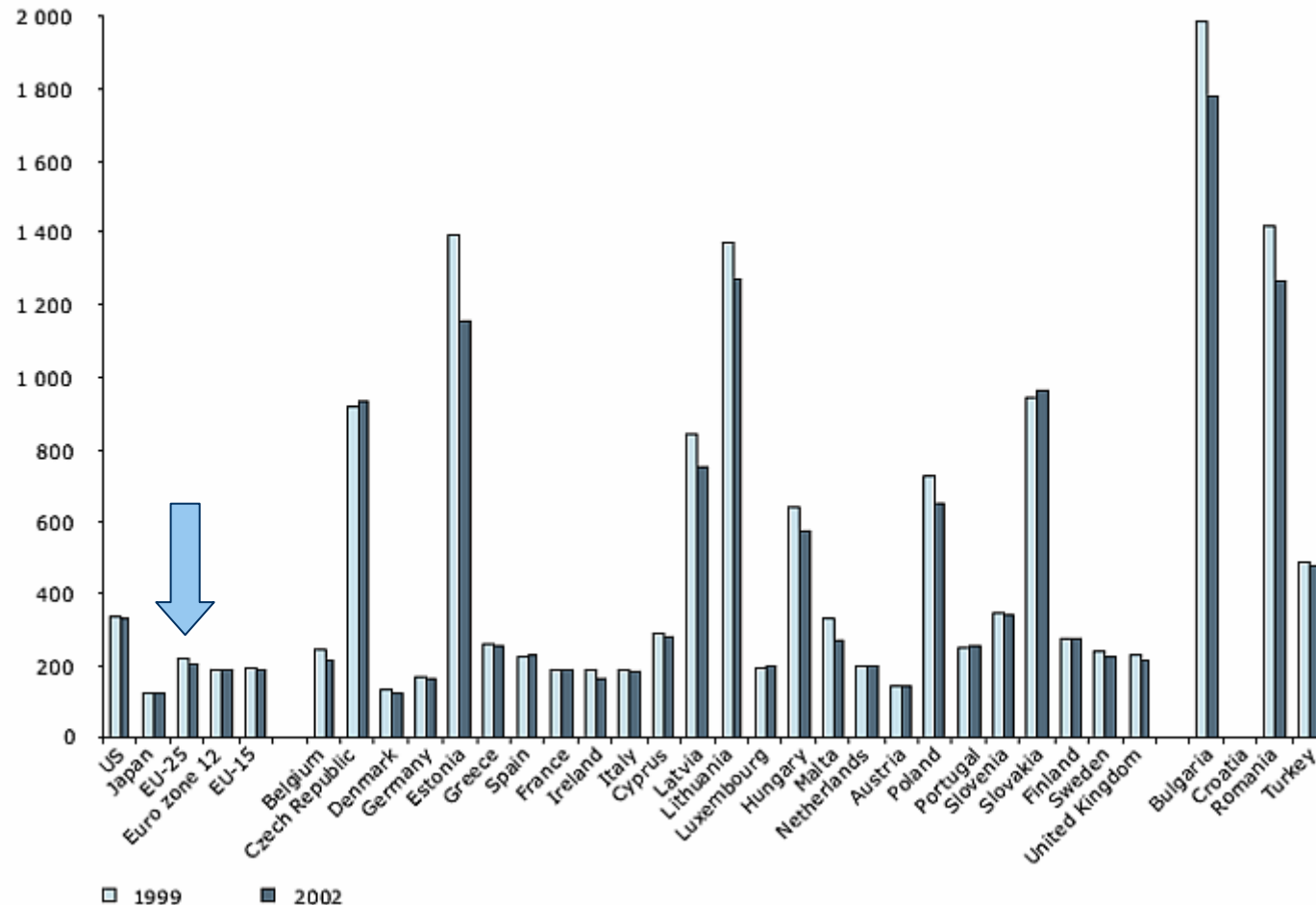
Total energy consumption in the EU-25 grew at an average annual rate of just below 0.7 % over the period 1990 to 2002, while gross domestic product (GDP) grew at an estimated average annual rate of 2 %. As a result, total energy intensity in the EU-25 fell at an average rate of 1.3 % per year.

Despite this relative decoupling of total energy consumption and economic growth, total energy consumption increased by 8.4 % over the period.

# Just how energy-intensive are EU economies ?

**Figure 2.5 Structural indicator, energy intensity of the economy**

Gross inland consumption of energy divided by GDP (Index, 1995 = 100)  
Kgoe (kilogram of oil equivalent) per EUR 1 000

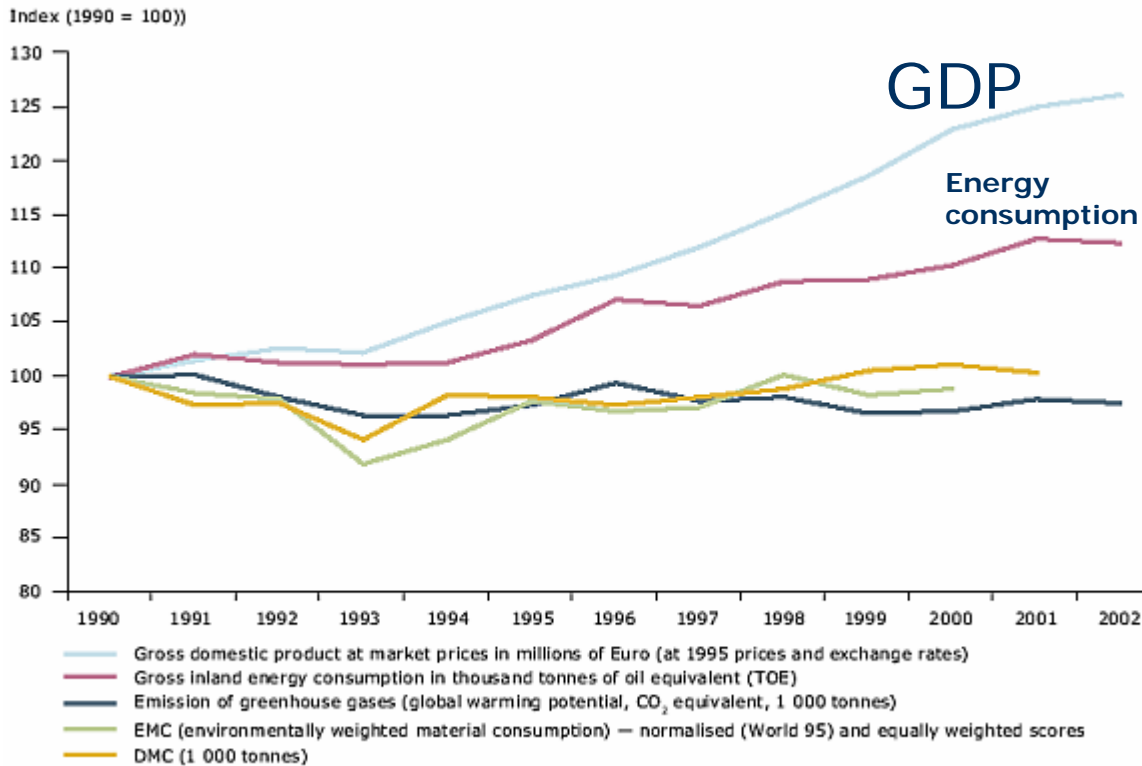


There is a large east-west gap in both economic performance and the levels of energy and resource efficiency.

For example, the energy intensity of the Czech Republic, one of the most technologically-advanced new Member States, is about five times higher than the EU-15 average

# Are we decoupling resource use and economic growth ?

**Figure 3.3 Relative decoupling of resource use and economic growth in the EU-15**



Sources: Eurostat NewCronos online database (GDP, energy, greenhouse gas emissions); van der Voet *et al.*, 2004 (EMC); Eurostat/IFF, 2004 (DMC).

Over the past decade, relative decoupling of economic growth from material and energy consumption has occurred in many EU countries.

This means that the increase in resource consumption (materials and energy) was no longer hand in hand with the rate of economic growth.

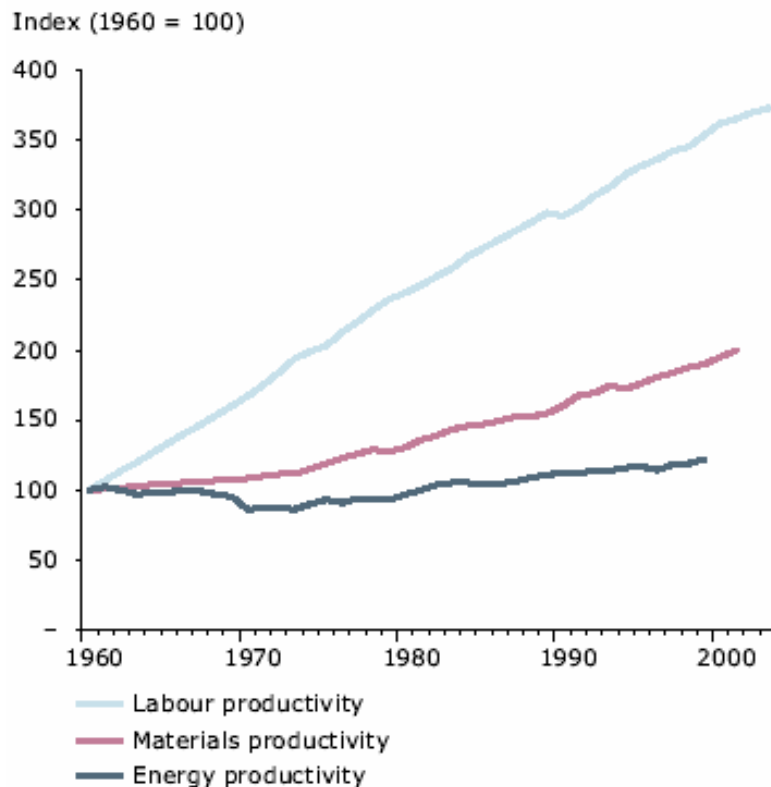
Two proxy indicators for environmental impacts (emissions of greenhouse gases, and environmentally-weighted material consumption) also show a similar relative decoupling.

However, even though Europeans tend to use resources more efficiently, we do not use fewer resources in absolute terms.

There are few, if any, indications of absolute decoupling, that is a decrease in actual consumption of materials, and of energy in particular.

# Productivity of labour, energy and materials

**Figure 4.2 Labour productivity, material productivity, and energy productivity, EU-15, 1960–2002**



**Note:** Labour productivity: GDP per annual working hours (1999 USD (converted at EKS PPPs) per hour); material productivity: GDP per domestic material consumption (DMC) (EUR per kg); energy productivity: GDP per total primary energy supply (TPES) (thousand 1995 USD per toe).

There is great potential for improving material and energy productivity, even in the advanced EU15 economies

Labour productivity is already high, having improved by more than 270% over the past four decades as a result of social security and tax schemes, which have concentrated mainly on income taxes, making labour relatively more expensive than resources.

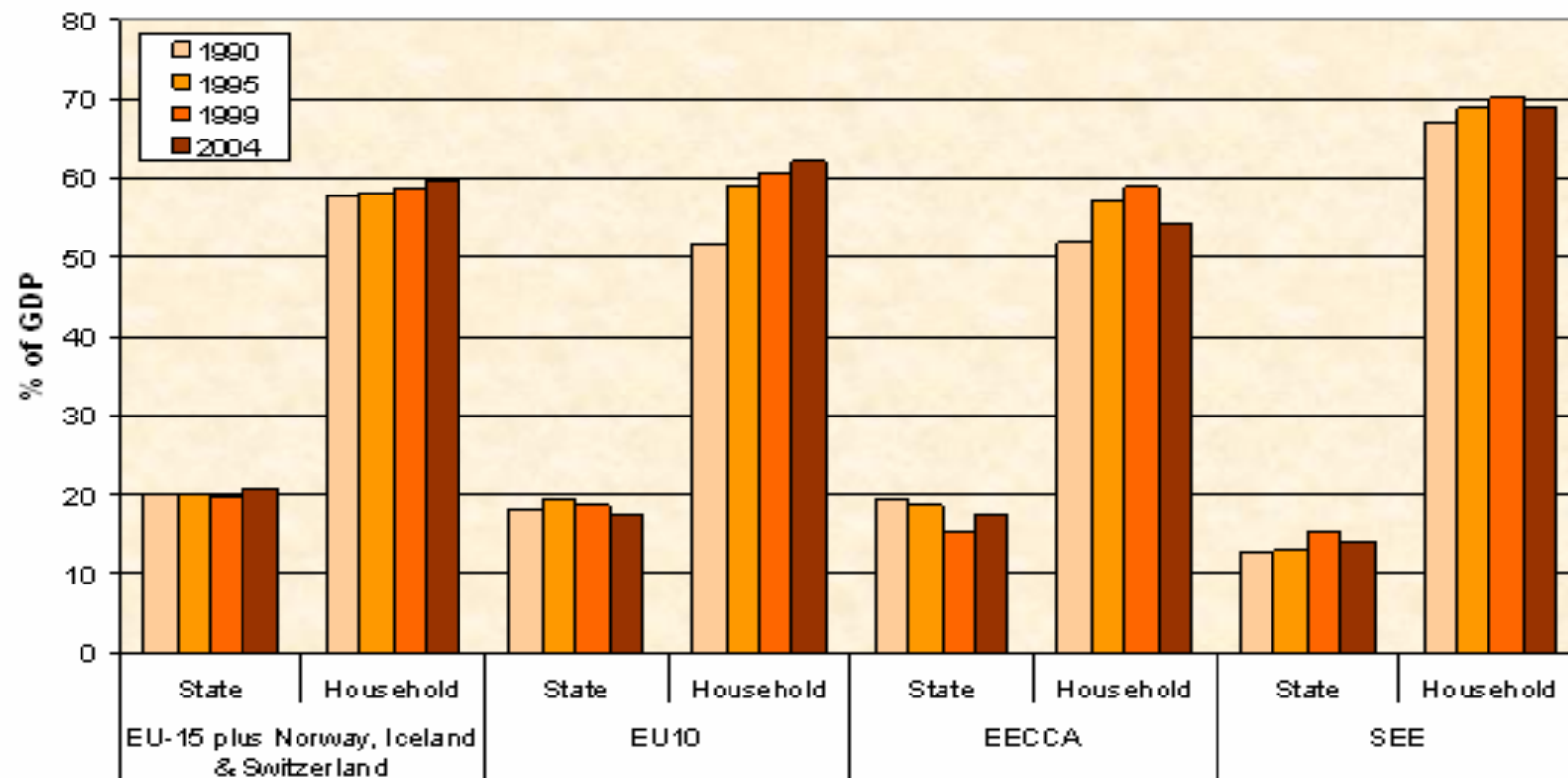
In the same period, the productivity of raw materials and energy increased by much less, 100 % and 20 % respectively

# What is happening to environmental pressures from production ?

- A small number of industries account for some 50-80% of total production-related environmental pressures:
  - agriculture,
  - electricity supply,
  - transport,
  - basic manufacturing
- Production-related environmental hot spots are already fairly well researched and understood
- While they have been successfully tackled by a wide range of environmental policies, it is open to debate whether these will be sufficient in the long term (consumption growth outstrips efficiency gains)

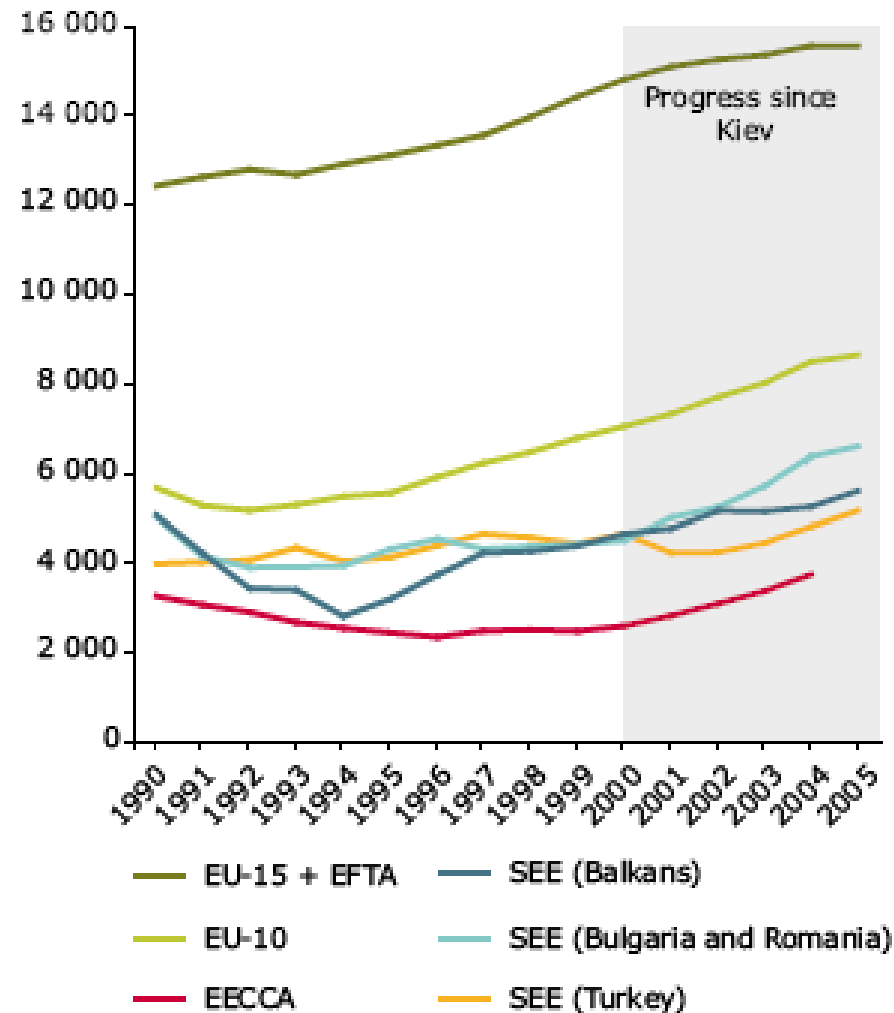
# Households responsible for the biggest share of consumption (55-70% of GDP)

Government and household final consumption expenditure as % of GDP



(Indicator 11c) Data Source: World Bank Development Indicators Database

# Continued growth in household consumption in Europe



- Household expenditure is expected to double by 2030
- Growing consumption is increasingly causing *global* environmental impacts.

# Greenhouse gas emissions – the three most important areas of consumption

18 % of GHG emissions



29 % of GHG emissions



19 % of GHG emissions



These three priority areas account for about 2/3 of overall pressures

# Climate change - the challenge ahead...

International Panel on Climate Change: the agreed goal is to cut GHG emissions in industrialised countries by 80% by 2050,

This means reducing TOTAL EMISSIONS to about 2 - 2.5 tonnes per capita a year

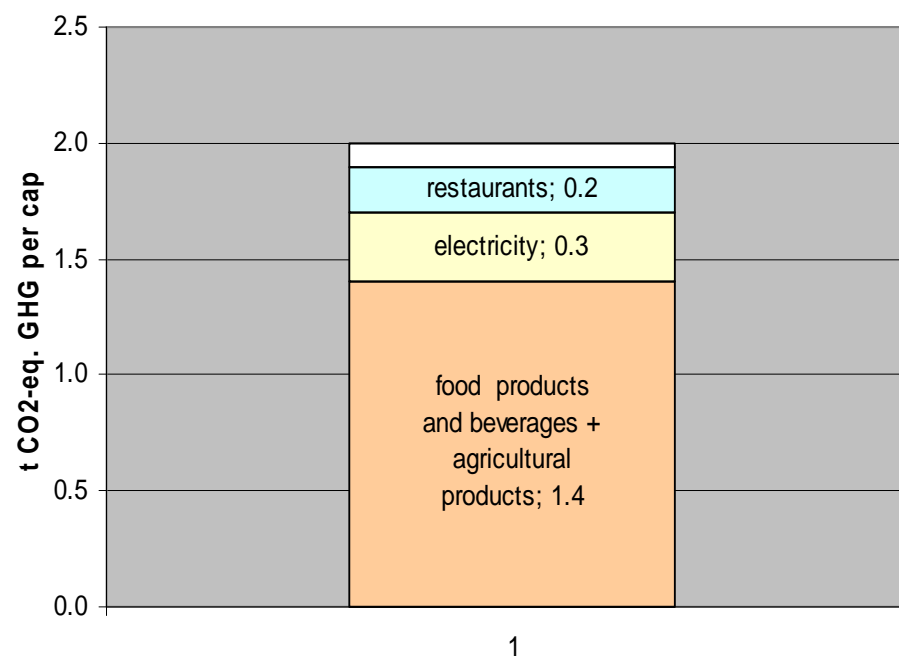
Meanwhile, **today each one of these three consumption areas ALONE accounts for between 2 and 3 tonnes of GHG emissions per capita**

# Eating & drinking

(ca. 2 t CO<sub>2</sub>-eq. GHG/cap)





eating & drinking

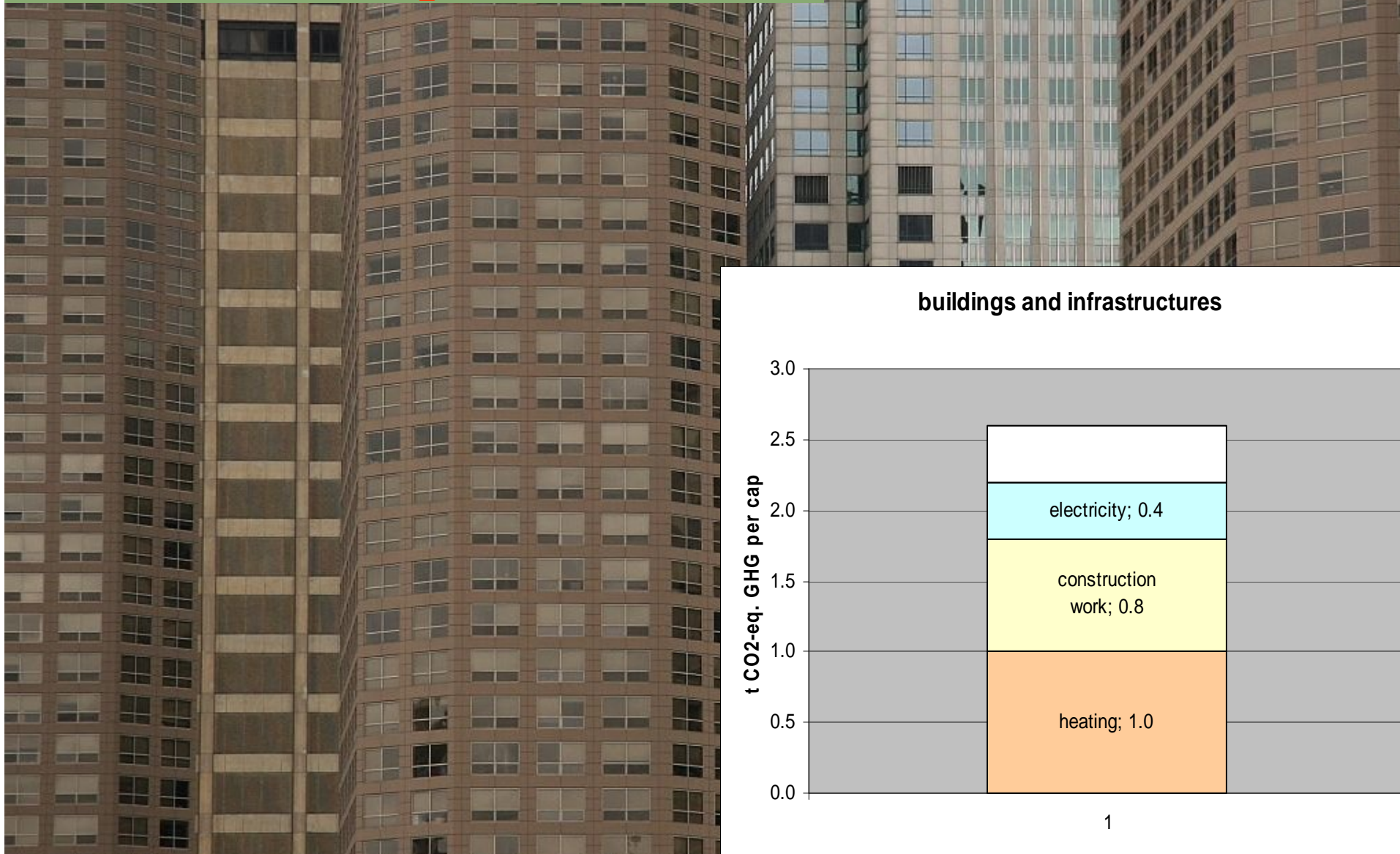


# What can we do about area of eating & drinking ?



- Potentials for improvements:

-  Change in diets: less animal products (e.g. beef, dairy products)
-  Less food waste: approx. 1/3 of food is wasted; reducing food waste implies less production-wide pressures
- Efficiency gains in production:
  - agriculture (less fertilizer, manure management), – limited, given current production-mix
  - food processing industry (less electricity use)
- Efficiency gains in storing and preparing food in retail sector, restaurants, private households

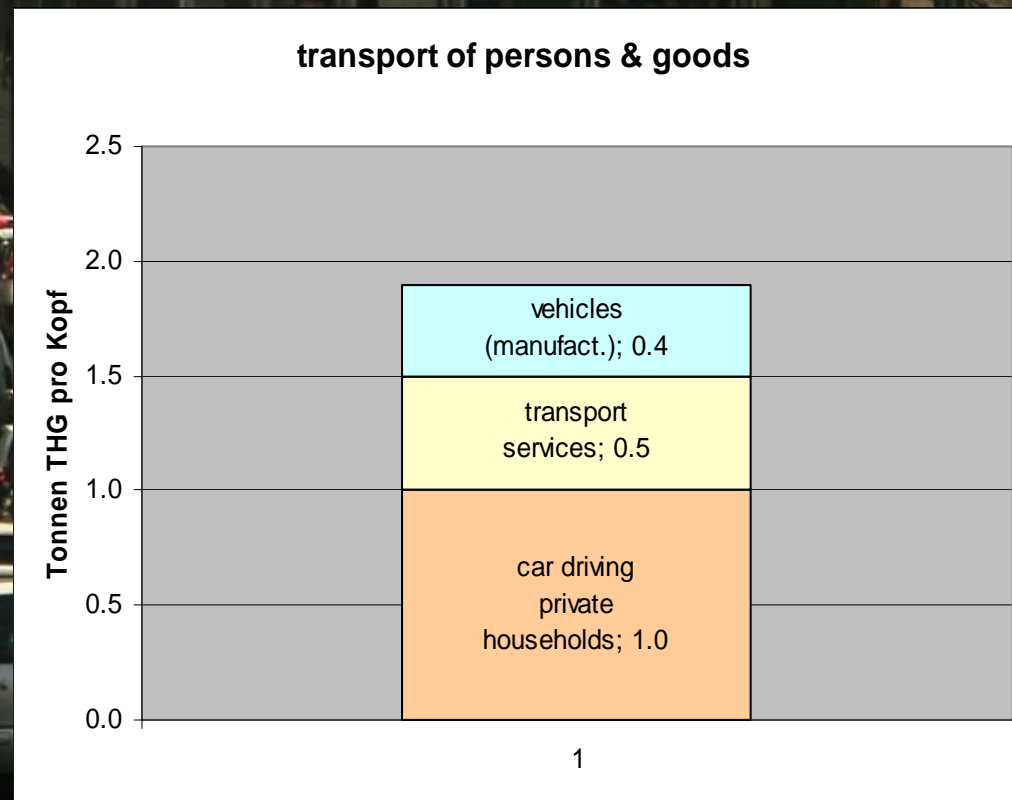
# Housing & infrastructures (ca. 2.6 t CO<sub>2</sub>-eq. GHG/cap)





# Priority actions in housing & infrastructure

- Potentials for improvements:
  -  Heating of buildings and hot water: e.g. through thermal insulation, use of solar-thermal techniques
  -  Efficiency gains in the manufacturing of building materials (including switch in building materials)
  - Decreasing net increase of stock: less new infrastructures and buildings
  - Reversing the ongoing trends: bigger flats and bigger malls and office buildings

# Transport of persons and goods (ca. 1,9 t CO<sub>2</sub>-eq. GHG/cap)

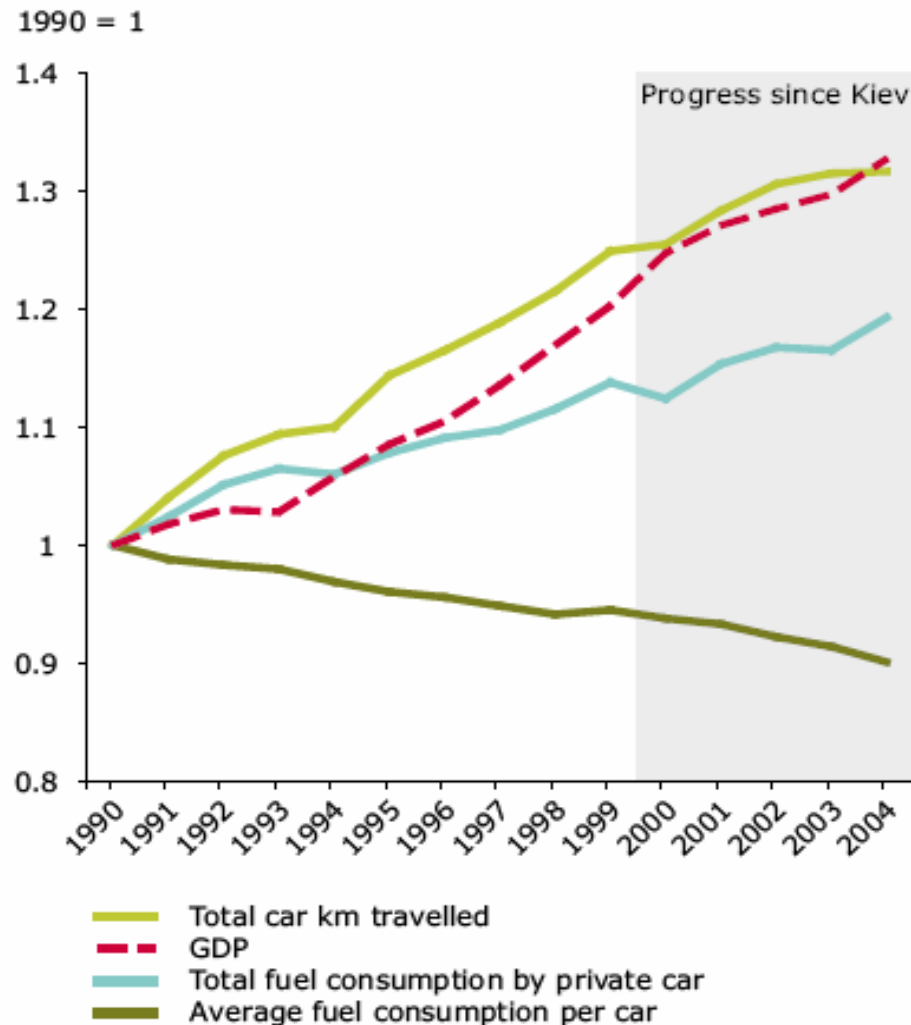


# Actions related to transport of persons and goods

- Potentials for improvements:
  - Better fuel efficiency of vehicles
  -  Efforts/incentives to slow down growth in transport (in particular private transport)
  -  Better organized public transport

# Is technology going to solve the problem?

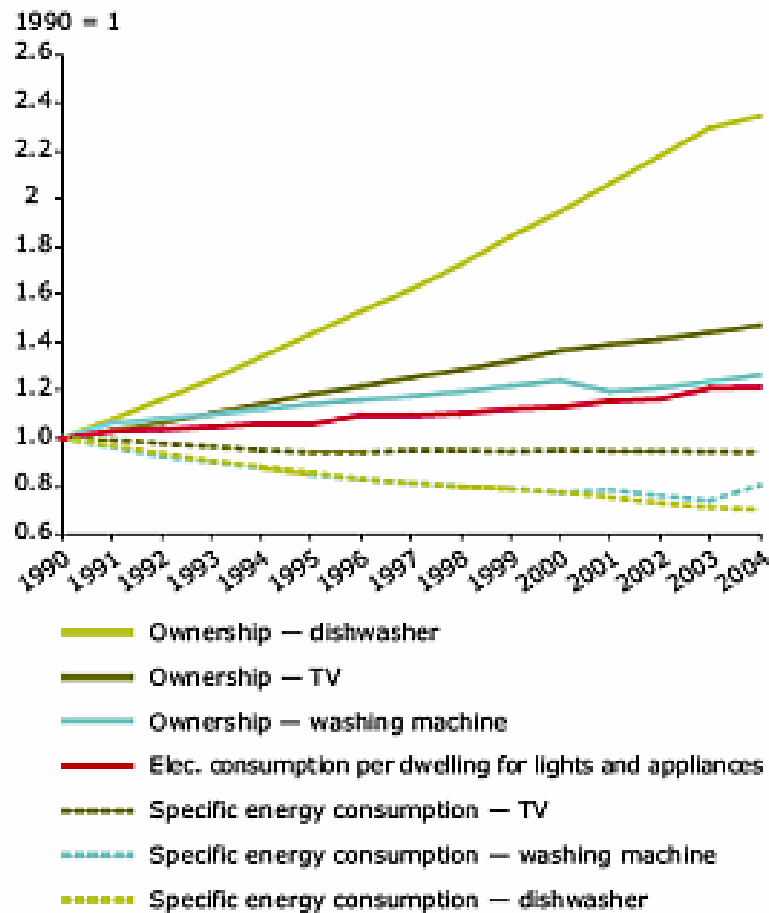
**Figure 6.17** Growth in private car travel versus fuel efficiency in EU-15



- Today's cars are much cleaner and more fuel efficient than 15 years ago, (dark green) but...
- the number of cars on the road has more than doubled...
- and people drive more (light green line) because of the lifestyle...
- Hence, much higher impacts from transport (blue line)

# Is technology going to solve the problem? /2

**Figure 6.15** Trends in energy efficiency, ownership, and overall electricity consumption of selected household appliances, EU-15



Source: Enerdata, 2006.

- Today’s dishwashers, TVs and washing machines are much efficient than 15 years ago, (dotted lines) but...
- the numbers in use have increased dramatically (solid line)
- Hence, much higher electricity consumption (red line)

## Some conclusions

- European pressures are unsustainably high. Emissions of greenhouse gases in industrialized countries need to be reduced by 80% by 2050 (IPCC).
- Achieving such high reduction targets will require radical changes in our consumption and production patterns.
- This goal cannot be achieved only through efficiency gains in production chains or by improvements in technology - changes in lifestyles will be necessary



**Thank you !**

**[www.eea.europa.eu](http://www.eea.europa.eu)**