

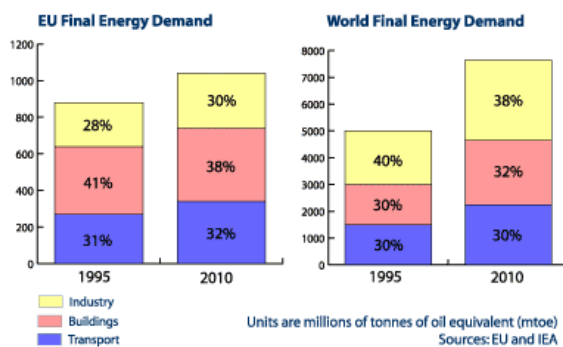
Sources of Carbon Dioxide

A look at the main sources of human-generated carbon dioxide. By Suzanne Hall

Final energy is the measure used to assess how much energy is used in an economy. It is the energy received by the final user (as when a motorist buys petrol). It is different from primary energy in that it excludes the energy lost in getting energy to the user in the required form. How final energy is used in the economy shows how carbon dioxide (CO₂) is produced in the various sectors of the economy relative to each other.

Global Final Energy Consumption

The trend to note about final energy consumption is the increasing consumption by the transport and household sectors in all parts of the world. Worldwide, industry's share of consumption relative to these two sectors is decreasing. *See charts below.*



In the EU, where industrialization is advanced, most demand is in the buildings sector (which includes the households sector and some part of the services sector) and transport sector. Increased energy efficiency measures in the buildings sector in the EU, however, causes projections to 2010 to show industrial demand rising relative to buildings. The relative consumption of the transport sector (freight and personal) is rising rapidly throughout the world. This is less noticeable in developing

countries because of comparable growth in the industry and buildings sectors. In the less industrialized countries, the most energy consumed today is in the industry sector. But the share of the household and transport sectors is increasing fast as electrification spreads and private transport becomes more common. Consumption patterns in less-industrialized countries, too, are expected to follow those of the industrially advanced economies.

Because of the different fuel types used in the different sectors, carbon emissions are not in the same proportion as final energy consumption. The proportion of carbon emissions of the industrial sector is generally higher than its proportion of energy consumption because industry uses carbon-intensive forms of energy. The proportion of emissions from the household sector is lesser where the use of natural gas and nuclear power is high. And emission levels from the transport sector are influenced by the relative use of the various modes of transport in an economy.

In the rest of this article, we briefly point out important trends in the various sectors individually and their impact on atmospheric CO₂.

Transport

It is estimated that in the average industrialized country today, of the total transport energy, 60% is used by individuals (that is, for personal transport); 24% by industry (mainly freight); and 16% by the services sector.

Increasing personal travel is a key feature of modern society. People are travelling further each year and more frequently. Car travel is becoming increasingly common as the cost of car travel has become considerably cheaper compared to public transport. As development follows car-based lifestyles in industrialized and rapidly industrializing countries, individuals are forced to buy into the car-dependent lifestyle. It is important to note that cars generate the highest CO₂ emissions per passenger of all land-based modes of transport.

As car travel has become relatively cheaper,

public transport is in decline. This is not only because public transport has become costly to maintain, but also because cars are more comfortable and more convenient. Walking and cycling is also on the decline, not so much because people wish to avoid the physical effort as because the transport infrastructure is built to suit motorized forms of transport over non-motorized. Finally, domestic and international air travel—which is the most energy-intensive form of transport and has effects on global warming that are three times greater than that measured by its carbon emissions—is increasing all over the world. Much of this travel is driven by tourism and business, which get people to travel more. Even NGOs contribute by hosting ever larger conferences at different locations more frequently—this, it has been pointed out, in an age of satellite linkups and teleconferencing!

Freight transport is also increasing rapidly because of growth-driven economies. Goods and farm and agricultural products are also travelling longer distances in a globalized world. Cheap air freight has made it possible to deliver products over long distances quickly. But these increases (in distance travelled and quantity of goods) is also due to business practices today, which emphasize regional distribution centres and ‘just-in-time’ deliveries.

Households

Household energy consumption is increasing mainly because electricity is now used for purposes that were not even invented 30 years ago: microwaves, personal computers, CD players, DVD players, etc. In poorer countries the spread of electrification is bringing more basic appliances into homes: refrigerators, music systems, TVs, electric ovens, washing machines, etc. There is now a large number of electricity-driven equipment in households, and ownership of such equipment is increasingly individualized. As wealth has increased and spread, energy consumption in households has also increased.

Industry and Services

Energy consumption in the industrial and services sectors depends on the industries and

services present in the economy and the level of economic activity. In general, however, economic activity has been increasing, explosively in some countries like China and India, less rapidly in the advanced economies of OECD countries.

Conclusions

From the above, it should be clear that it is we, as individuals, who are responsible for final energy consumption. In advanced economies, individuals account directly for around 50% of energy consumption (accounting for some 45% of carbon emissions). In less advanced economies, that figure is lower but rising. And underlying the consumption patterns of today is an economic model advocating growth above other considerations.

We can alter consumption patterns by either calling for a change in the economic model, or by making consumption choices more carefully.

30 September 2004. References: ‘How We Can Save the Planet’ by Mayer Hillman, Penguin, 2004.

SIDEBARS

Driving the Emissions

Americans are driving more in less-efficient vehicles. Sales of sports utility vehicles and pickup trucks have been amazingly strong considering the recession, and low pump prices are keeping people on the roads.

– Mike Lucky, analyst for John S Herold Inc, December 2001.

SIDEBARS**The Pleasures of Flight**

One person flying in an airplane for one hour is responsible for the same greenhouse gas emissions as a typical Bangladeshi in a whole year.

– Beatrice Schell, European Federation for Transport and Environment, November 2001.

Economic Growth Above All Else

We must act to ensure continued economic growth for our citizens and for citizens throughout the world.

– George W Bush, US President, June 2001.