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Oil Watch: Europe and North America - Total Oil Products Demand

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Continuing on from six posts that looked at global oil production trends, we now turn our attention to oil consumption / demand, which in our opinion, is every bit as fascinating and important to understanding the global energy system. In this post we focus on Europe and North America using JODI data (Joint Organisations Data Initiative) which is based upon figures reported by national governments which we therefore assume to be reliable. The JODI data base is not complete. Reporting began in January 2002. Most OECD countries have a complete set of reports but a number of countries like China only began to report in January 04 and many developing countries have a patchy reporting record. Russia and the former states of the Soviet Union do not report oil consumption figures at all.

Figure 1 This group of 11 countries classified as "Europe Core" combined show near uniform demand for oil products for the past decade. We consider this to be a somewhat remarkable trend since oil prices rose from $31/bbl in 2002 to >$100/bbl in 2008 (annual averages). Following 2008 the world has witnessed the biggest financial crisis since 1929. And yet demand for oil in this group of countries has been hardly affected by these momentous events. Note that this group includes Switzerland and Norway, neither of which are members of the Euro or the EU. These 11 countries typically have strong manufacturing / exporting economies. It seems likely that none will have significant oil fired power generation. All have modern motor vehicle fleets that already deliver fuel economy much higher than in N America. All but Norway are dependent upon imported oil.

Oil Watch posts are joint with Rembrandt Koppelaar.

Understanding oil demand data

Oil demand is influenced by a large number of factors such as population size, level of economic development and economic activity, social outlook, living arrangements, climate, energy efficiency and energy mix. The trends of oil demand change with time discussed in this and future posts may be explained in terms of 4 main factors:

Energy efficiency - improvements in energy efficiency with time may result in a reduction in demand for oil.

Demand destruction - high oil prices, and other economic woes, that lead to slow down in economic activity and higher levels of unemployment, may result in reduced demand for oil.

Substitution - high oil prices may lead to different energy sources substituting for oil, the most

common one is to switch from oil to coal or gas fired electricity generation. This may result in reduced demand for oil. Government policies aimed at reducing CO2 emissions may also encourage substitution of low carbon energy sources for fossil fuels.

Seasonal affects - cold winters may create demand for more energy, including oil, and hot summers may create seasonal demand for air conditioning.

Figure 2 Oil demand in Greece, Portugal and Ireland shows marked seasonal cycles with the peaks centered on January, i.e. the northern hemisphere winter. This suggests temporary use of oil fired power generation to help meet higher winter demand for electricity. Oil demand in this group was rising until 2006 when a marked demand decline set in, two years ahead of the financial crash, suggesting that high and rising oil prices were the initial trigger for this trend. With time, the seasonal cycles have become less marked suggesting that oil fired electricity generation is being phased out. Further investigation is required to fully understand this. The collapse in economic activity in these countries will account for some of the reduced demand whilst substitution in electricity generation may also account for some of the reduced demand.

Figure 3 The UK, Spain and Italy are the big brothers of Ireland, Portugal and Greece on the geographic periphery of Europe. Together, the UK, Spain and Italy show a similar trend to their smaller neighbors. Oil demand was stable at 5 million bpd from January 2002 until 2006 when a demand decline set in that continues to the present day. These large countries lack the annual cycles seen in their smaller neighbors. The fall in demand in these large countries is about 20% compared with approximately 28% in Greece, Portugal and Ireland.

Figure 4 Taking a closer look at the UK, Spain (Figure 5) and Italy (Figure 6) separately we see that the fall in UK demand for oil is less marked than in Spain and Italy. The UK oil demand pattern is transitional between the core (Figure 1) and the periphery. In each of these countries the fall in demand for oil products is likely due to substitution, energy efficiency gains and demand destruction from high oil price, recession and unemployment. Given the economic woes of these three countries it seems likely that demand destruction will be the main force driving demand for oil down.

Figure 5 Oil products demand in Spain was rising until 2005 but has been in steep decline since 2008 and shows no sign of stabilising.

Figure 6 Oil products demand in Italy has been in steep decline since 2006 and shows no sign of stabilising.

Figure 7 The remainder of Europe comprises the East European countries, formerly part of the Soviet block. Some, like Poland, Czech Republic, Hungary and Slovenia are now members of the EU. Note that the JODI reports are incomplete for some of these countries. Oil demand was rising until 2007 when it stabilised and since 2008 it has been falling slowly. The decline in demand for oil in East Europe is much less marked than in the western and southern periphery. These countries have marked seasonal cyclicity with peaks centered on the N hemisphere summer. There are two possible explanations. Either these countries are using oil fired electricity to power air conditioning. Or summer demand reflects an influx of tourists.

Figure 8 To summarise the oil demand situation for Europe all 28 countries are stacked in this chart. The picture is one of gradually rising demand at the beginning of the 10 year period, plateauing in the years 05 to 08 followed by gentle decline. Oil demand has dropped about 2 mmbpd or 12% on the whole but this masks regional trends where demand has been robust in the core areas and has fallen in the periphery countries.

Figure 9 Crossing the Atlantic, this chart shows the equivalent picture for the three countries of the N American continent. The overall picture is not too dissimilar to Europe, but like Europe this summary chart masks significant regional variations.

Figure 10 Canada and Mexico are both oil exporting countries and show a trend of increasing oil consumption with time. On balance, high oil prices benefit these economies. For good measure, Norway has been added to this chart completing the trio of OECD oil exporters.

Figure 11 Finally, the USA dominates N American oil consumption. It had rising consumption at the start of the 10 year period with consumption peaking in the years 05 to 08 followed by a sharp fall of about 2 million bpd. Oil consumption seems to have stabilised at around 19 million bpd. Note that this chart is not zero scaled. The percentage drop is around 10% which is slightly less than for the Europe 28 group. Unemployment remains stubbornly high in the USA at around 7.7% and that will account for some of the fall in oil demand. The energy efficiency of the motor vehicle fleet is improving however and it seems possible with the current abundance of gas and coal that there is a degree of energy substitution. Compared with Europe, the USA has enjoyed relatively strong economic growth in recent years and it is noteworthy that this growth has been delivered alongside a drop in demand for oil. Low fuel taxes combined with a highly inefficient motor vehicle fleet means that the US is more highly geared than Europe to respond to high oil prices. The impact of high prices is more marked in the USA and there is much more room for energy efficiency gains.

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Oil Watch - Global Liquid Fuel Production Trends (EIA data)
Oil Watch: North America Liquid Fuel Production