





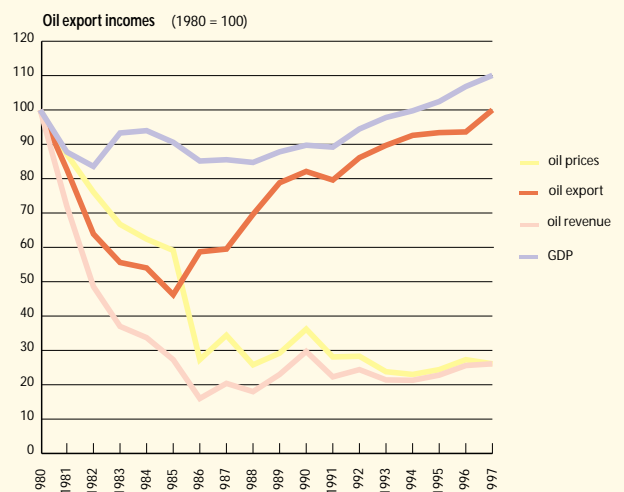
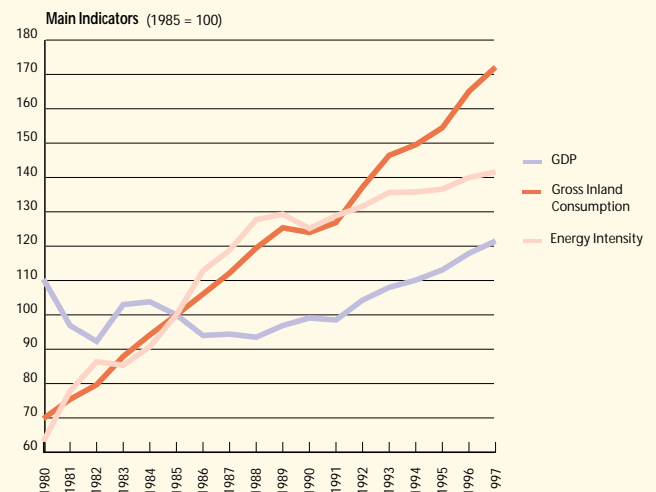
MIDDLE EAST: Major trends (1980-1997)

- Economic development is becoming less dependent on oil revenues
- Despite weak GDP growth final energy demand has more than doubled since 1980
- Tertiary-domestic sector dominated final demand for structural reasons, but industry is increasing rapidly
- Electricity's contribution stabilised in the tertiary-domestic sector but increased in industry
- Oil products dominated the energy market although gas increased to reach 37% in 1997
- Oil production close to the historical peak of 1974
- The Middle East accounted for 50% of world hydrocarbon reserves
- First steps towards private investments in power generation
- Oil refineries heavily dedicated to exports
- Related to GDP evolution, energy intensity increased continuously, but its growth rate slowed down in the 1990's
- CO₂ emissions increased by 5.4% per year since 1990
- Despite the financial crisis, Asia remained by far the largest market for oil exports

This region includes 13 different countries: Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates and Yemen. These countries together represent a population of 157 million inhabitants, growing by more than 3% per year over the last 6 years. Over this period, the region has undergone several wars, involving two or more countries (Lebanon, Iran-Iraq, Gulf war...) inflicting severe damage to basic industrial and energy infrastructures. The situation has become progressively more peaceful and clear progress in welfare and industrial activity is noticeable. The region is also one of contrasts, including some developing countries but others which show characteristics of highly-industrialised countries.

Economic development is becoming less dependent on oil revenues...

Economic development in this region continues to be mainly influenced by crude oil prices and production as many of these economies rely heavily on the extraction and exportation of a single commodity. In other words, oil price and production fluctuations induce significant changes in the terms of trade and export incomes. Between 1980 and 1985, the combination of low oil prices and falling oil exports reduced oil revenues by 40% with a consequent GDP reduction of about 10%. The rapid decline in oil prices in 1986 by more than 50% was coupled with a GDP slump of about 5.5%. After four years of stagnation, GDP rose steadily in the 1990s at an average yearly rate of 2.9% until 1997. At the same time, oil prices remained quite low even during the Gulf War but exports increased regularly to recover their 1980's level in 1997. The progressive development of the economy outside the oil industry reduced the sensitivity of GDP to oil revenues, principally during the 1990's when GDP increased by 20% whereas oil revenues declined by 14%.





In many countries in the region, an informal social contract exists whereby the population benefits from the fact that their country is a large net oil exporter. Much of the benefit comes in the form of low energy prices. However, these subsidies reduce the profitability of the energy distribution companies. The situation is made worse by the fact that many publicly-owned enterprises do not pay their energy bills. Subsidies not only reduce the energy prices paid by consumers, but also result in large public sector deficits when oil prices or production are low.

ENERGY OUTLOOK

Despite weak GDP growth final energy demand has more than doubled since 1980...

Despite weak GDP **final energy demand** has more than doubled since 1980 under the pressure of increasing population and industrial development. With the exception of the Gulf War period, this growth has been quite steady, about 5% per on average since 1980; and relatively uniform over the whole region with the exceptions of Iran and Oman which grew substantially faster; and of Kuwait and Qatar which remained stable. The shares of Iran and Saudi Arabia, the two major contributors, increased continuously to reach 64% of the whole region's energy consumption in 1996 compared with 58% in 1980.

MIDDLE EAST : FINAL ENERGY CONSUMPTION (MTOE)						
	1980	1985	1990	1994	1995	1996
Middle East	87.9	118.6	144.1	184.3	188.2	199.0
Industry	35.4	39.0	26.0	44.0	44.8	49.1
Transport	30.1	42.1	41.1	56.6	59.4	60.8
Tertiary-Domestic	22.4	37.4	76.8	83.6	83.9	89.0
Iran	28.5	43.1	47.7	72.1	73.8	80.4
Industry	10.5	16.9	5.7	21.5	21.1	24.3
Transport	4.6	6.2	7.1	17.8	20.1	20.9
Tertiary-Domestic	13.4	20.0	34.9	32.7	32.6	35.1
Saudi Arabia	22.3	26.5	38.3	44.2	43.5	46.6
Industry	12.6	6.7	4.7	4.3	4.1	4.8
Transport	7.6	12.5	9.9	12.3	12.1	12.8
Tertiary-Domestic	2.1	7.2	23.8	27.7	27.3	29.0

Consumption by fuel highlights the major contribution of hydrocarbons and electricity, the shares of both solid fuels and biomass being less than 1% of total final demand. Since 1980, the incremental energy demand of about 111 Mtoe was met by oil products for 54%, second by natural gas for 29% and finally by electricity for 16%. During the same period, the consumption of oil products doubled, that of natural gas tripled and electricity increased fourfold approximately. This means that the weight of oil products in final consumption was declining slowly. In 1996, oil

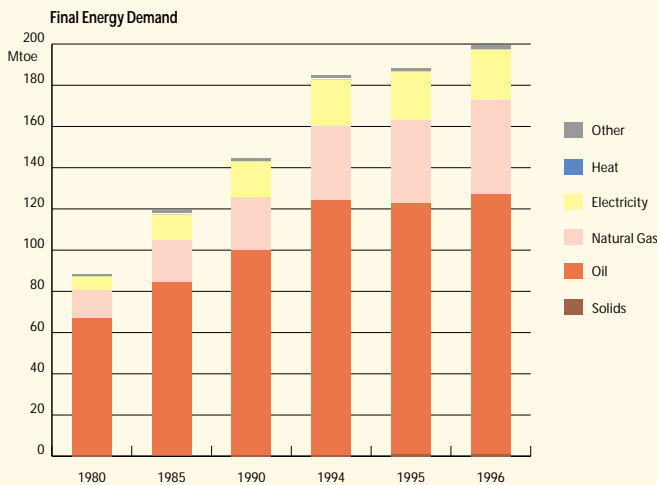
Main items

The Middle East is the most energy-orientated region of the world. In recent years, both the development of non-OPEC sources of oil and falling real oil prices in international markets have reduced oil-related export earnings and hence government revenues. But, in 1997, the Middle East accounted for some 65% of global oil and a third of world gas reserves. These geological realities dictate that the Middle East will increase its significance in global energy balances over the next few decades and that much of the region will continue to rely very heavily upon oil and gas revenues. The growth in population is matching that of GDP, with the result that regional average per capita incomes are growing quite slowly. Huge income inequalities remain given the control of oil revenues by states and royal households. Attempts continue to diversify many economies away from crude oil exports - particularly by adding value to basic natural resources through refining, petrochemicals and iron and steel, but also by an emerging electrical/electronic goods sector. Population growth and continued economic development are increasing regional energy demand. Gas use is expanding, especially in power generation but also in final end use sectors. In the medium and longer term, gas exports to Asia and Europe will assume much greater economic and strategic importance. Electricity demand is growing very quickly. Partly because of continued subsidisation of consumer prices, many electric utilities' self-financing ratios are inadequate to finance capacity expansion or to provide adequate incentives to attract external private capital. This suggests that liberalisation and privatisation efforts will need to accelerate, particularly in the power sector; but they will need to be accompanied by pricing and regulatory reforms, too.

accounted for 63% (76% in 1980), gas for 23% and electricity for 12%. This underlines the efforts made by national governments over a number of years to develop indigenous gas consumption, in place of oil products, thus increasing oil exports and consequently oil revenue. This was particularly the case in Iran and Saudi Arabia.

Tertiary-domestic sector dominated final demand for structural reasons, but industry was increasing rapidly...

The evolution of final demand by sector was largely dominated by the tertiary-domestic sector which quadrupled its consumption since 1980, though the growth rate has declined to around 2% since 1990. As a consequence its share in total final demand increased from 25% in 1980 to 45% in 1996. Although this results



from a general phenomena of rapid increases in living standards during the 1980's in a region where some countries presented the highest world income per capita, it was certainly reinforced by low energy prices in force into some countries. The rapid increase of the population was combined with rising energy consumption per capita which increased from 244 kgoe/inhabitant in 1980 to 573 kgoe/inhabitant in 1997 or an increase by 135%. Industrial energy consumption, deeply affected by the Gulf War which reduced the 1990 energy demand to only 90% of the 1980 level, grew by 11.3% on average since 1991, sustained by industrial development in the region. This impressive diversification out of oil, combined with associated services (banking, insurance...) became the driving force of GDP growth. Energy consumption for transport has only doubled since 1980, driven mainly by Iranian demand. Total vehicle ownership in the Middle East has remained largely unchanged in recent years, at about 100 vehicles per thousand people. There are two reasons for this. First, car ownership levels are highly dependent on income distribution. Second, women are actively discouraged from driving in some countries and this policy will inevitably limit the proportion of the population that owns cars.

Electricity's contribution stabilised in the tertiary-domestic sector but increased in industry...

The electricity share in final demand reached 12.4% in 1996 from 7.6% in 1980. Both in the industrial and domestic sectors, the share's evolution fluctuated widely, partly because of the statistical uncertainties about data on the share of electricity consumption by end uses over the period. Bearing this reservation in mind, the share of electricity in industry increased from 4% in 1980 to 8.7% in 1997 due to the development and modernisation of industrial infrastructures. But this contribution remained particularly low compared to industrialised countries. On the other

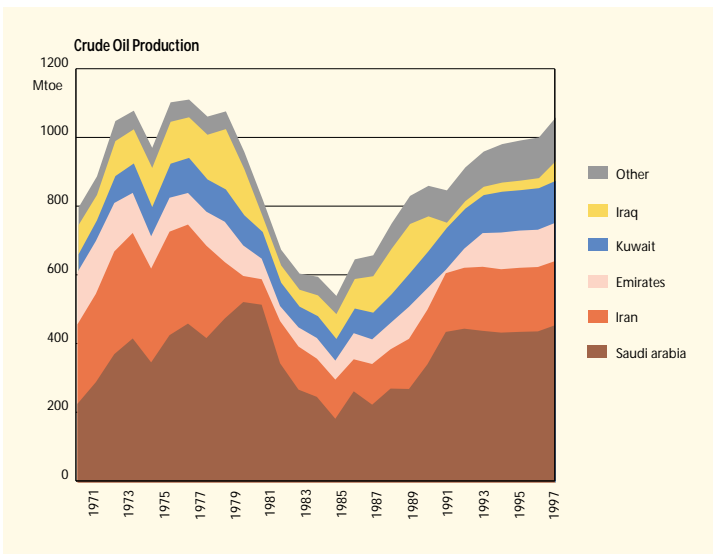
hand, electricity's share in the tertiary-domestic sector remained at 23% during the whole period. In addition, the contribution of electricity to final energy demand varied widely within the region, depending upon the prosperity, geographical implantation and economic activity of the countries. The highest levels were observed in rich countries developed around a big city: Kuwait (33%), United Arab Emirates (21%), Oman (21%) and Qatar (19%). Among other well-industrialised countries, Israel (25%) and Saudi Arabia (16%) sustained their contribution. The lowest shares of electricity in final demand were in Iran (8%) and Yemen (5%).

Oil products dominated the energy market although gas increased to reach 37% in 1997...

Gross inland energy consumption grew by about 5.4% on average in the period 1980-1997. Oil products dominated the energy market although their contribution declined in favour of natural gas, the share of which increased from 25% in 1980 to 37% in 1997. Nevertheless, hydrocarbons together met about 97% of all energy requirements in 1997. Energy policy trends are promoting further diversification of supply, by substituting gas use for oil, more of which is thus reserved for export. Solids contributed a little less than 2%. Israel and Iran accounted for most of the 6.5 Mtoe of coal consumed in 1997, mainly for power generation. Renewables, mainly limited to hydro, represented less than 1%. Only two countries, Iran and Syria, generated about 90% of the region's hydroelectricity. Saudi Arabia and Iran accounted together to 81% of region's gross inland consumption, a stable situation since 1980.

Oil production close to the historical peak of 1974...

Indigenous energy production is largely dominated by oil, which accounted for 89% of total production in 1997 compared with 96% in 1980. Oil production has fluctuated widely over the last 25 years, influenced by the world economic situation and by local circumstances (the Iran-Iraq War and Gulf War). Peaking in 1974 at a level of 1106 Mtoe, oil production fell to 548 Mtoe in 1985 or 51% below this peak. Since then, there has been a sustained increase, except for a drop of 1.5% in 1991 (when production losses in Iraq and Kuwait were not wholly compensated by strong increases in Iran and Saudi Arabia), so that in 1997 the production level was again close to the 1974 peak output. Historically, Saudi Arabia has assumed the role of swing producer, thus experiencing significantly larger fluctuations than those observed at the regional level. But since 1991, the output from the three main producers, Saudi Arabia, Iran and the Emirates has remained stable, with all the increase coming from Kuwait and the more marginal producers. In 1997 Iraqi production doubled compared to the 1996 level following a partial relaxation of the United



Nations embargo but its output still remains much below its historical level. The expansion of oil production will require sustained efforts by some producing countries to attract investment capital to finance a wide range of production capacity expansion projects.

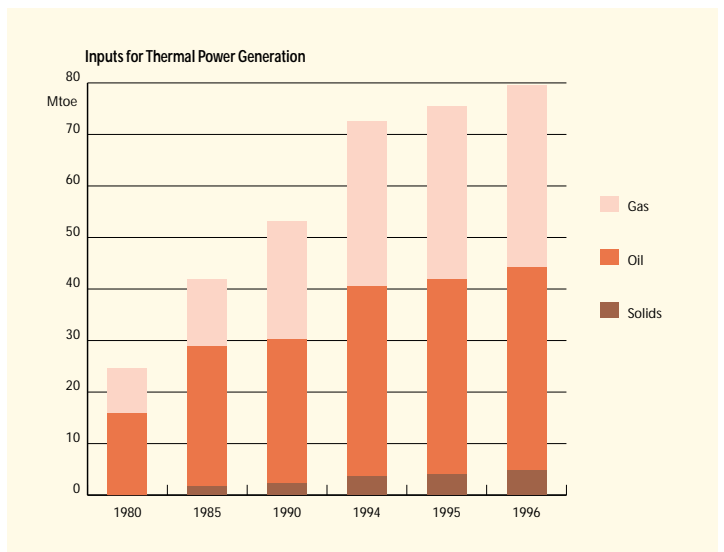
Regional production of natural gas has more than tripled since 1980. The main producers, Saudi Arabia with 38 Mtoe, Iran with 36 Mtoe and the United Arab Emirates with 30 Mtoe, accounted for 79% of total production against only 58% in 1980. Iran has the world's second largest natural gas reserves, exceeded only by those of Russia. Development of the 321 trillion cubic feet South Pars Field, which accounts for an estimated 40% of Iran's gas reserves, is a priority for the Iranian government. The development of these reserves should help Iran maintain its oil output by using gas in enhanced oil recovery gas injection schemes, as well as providing a potentially important export commodity. In 1997, the energy companies Total (France), Gazprom (Russia) and Petronas (Malaysia) signed an agreement with the Iranian National Petroleum Company to commence development of the South Pars reserves. The agreement was signed despite the threat of sanctions under the US Iran-Libya Sanctions Act of 1996.

The Middle East accounted for 50% of world hydrocarbon reserves...

Middle East oil reserves at end 1997 amounted to about 65.2% of world reserves, due to the major contributors: Saudi Arabia (25.2%), Iraq (10.8%), UAE (9.3%), Kuwait (9.3%) and Iran (9%). The reserves/production ratio reached 88 years, more than twice the world average. The situation regarding gas reserves was also impressive with 34% of world gas reserves being located in the region, mainly in Iran (15.8%); and a reserves/production ratio well above 100 years. However, regional coal reserves are negligible. This means that the Middle East accounts for 50% of world hydrocarbon reserves but only 15.2% of total global fossil fuel reserves.

First step towards private investments in power generation...

Electricity generation in the region grew on average by about 8.4% a year since 1980, but by only 6.5% a year on average since 1990. The region's electricity fuel mix was dominated by oil and gas, which in 1996 accounted for 89% of total generation. Since 1980, the most interesting feature has been the switch from oil to gas-fired generation, as countries in the region seek to free up oil for export. Most of the existing power plants utilise steam boilers burning heavy fuel oil, natural gas and crude oil. Gas turbines and diesel engines are used for mid-merit and peaking duty. However, the majority of the Middle East's new generating capacity is likely to be gas-fired. This increasing contribution of gas provides the opportunity for the future deployment of high efficiency combined cycle power stations. Israel is the only country in the region to use coal-fired power stations, with a coal-based capacity in 1995 of 3125 MWe. Hydroelectric capacity in the region was about 5 GWe in 1996, most of it in Iran and Syria. These two countries accounted for 91% of total hydroelectricity generation in 1996.



In recent years, a lack of power generation capacity has resulted in electricity shortages in some countries. The summer peak load for air conditioning places a heavy strain on available capacity, and power shortages usually occur in the summer. Many of the countries in the region have experienced financial difficulties in their power generation sectors because of rapid growth in electricity demand and inadequate tariff structures. Given that the power sector investment budget for many Middle East countries is often a significant proportion of total annual government expenditure, governments are increasingly forced to examine full-cost pricing and private sector involvement. Iran is currently restructuring its national electricity industry, considering allowing greater private participation in electricity supply and removing restrictions on



foreign ownership. In the same way, the Saudi Government is also for the first time relying on international capital markets to fund electricity projects. In addition, a build-own-operate (BOO) scheme was opened for a planned 1,750 MWe oil-fired project.

Oil refineries heavily dedicated to exports...

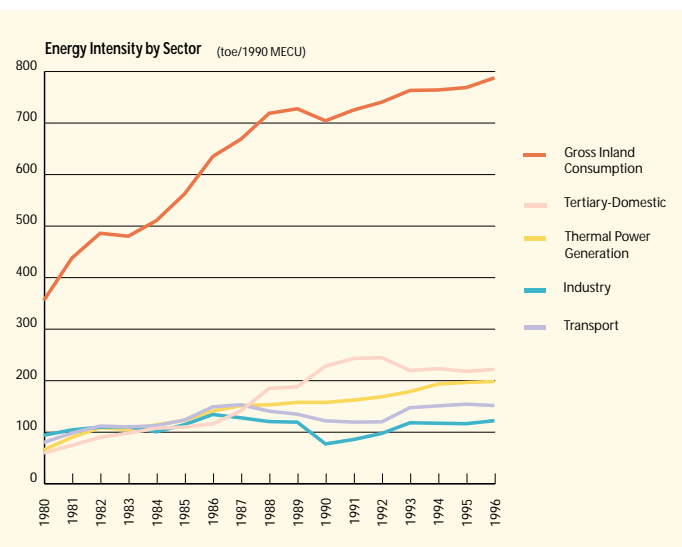
In 1997, **the refinery capacity** (5.8 millions barrels day) represented 7.3% of world capacity (4.4% in 1980). Since 1980, this capacity grew on average by 2.9% per year, mainly led by Saudi Arabia (7.6% per year). At the same time, the utilisation rate of the refineries remained above 95%, the highest level in the world. Refineries were heavily dedicated to exports outside the Middle East, such exports accounting for about 45% of their total production in 1997.

COMPETITIVENESS

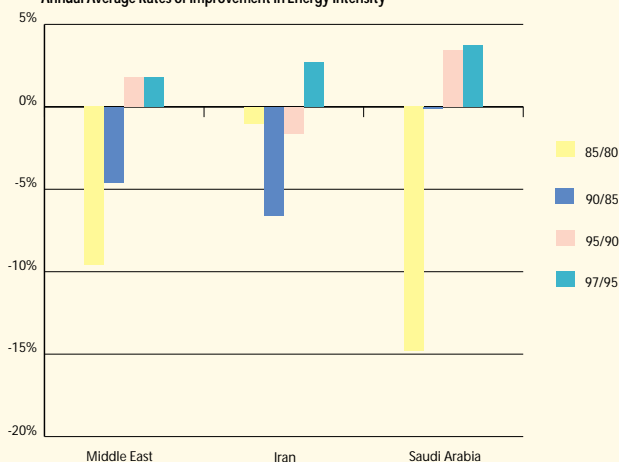
Related to GDP evolution, energy intensity increased continuously, but its growth rate slowed down in the 1990s...

The energy intensity indicator was particularly difficult to analyse as GDP was heavily influenced by oil revenues, especially during the 1980s. Since then, the development of both industry and services, independent of oil activities, has led to economic diversification and tended to stabilise and reinforce GDP growth. As a result of flat GDP and increasing gross inland consumption, energy intensity has increased significantly since 1980: by about 10% per year during the early 1980s and by about 5% in the late 1980s. However, because of the regular GDP increase during the 1990s, the energy intensity growth rate slowed down progressively since 1990 to reach only 1.2% in 1997. As a result energy intensity more

than doubled since 1980. From being comparable to the European Union's intensity in 1980, it was more than three times higher in 1997. In addition, very large variations exist within the region. Major increases occurred in Iraq (15.8% per year on average since 1980), the United Arab Emirates (+7.1%) and Saudi Arabia (+5.6%). This trend resulted from rapid and diversified industrialisation in many countries and improving living standards. All sectors contributed to the energy intensity growth but the major increase occurred in the tertiary-domestic sector where it has almost quadrupled since 1980 in spite of a relative stabilisation since 1990, resulting from the sustained growth of GDP partly driven by a reinforcement of services. At the same time, energy intensity of industry, pushed by rapid industrialisation of the whole region, started to increase rapidly during the 1990s with an average yearly growth of about 9.3% since 1991, following the Gulf War. The energy intensity of transport increased sharply during the early 1980s, remained quite stable during the late 1980s but rebounded again in the 1990s.



Annual Average Rates of Improvement in Energy Intensity



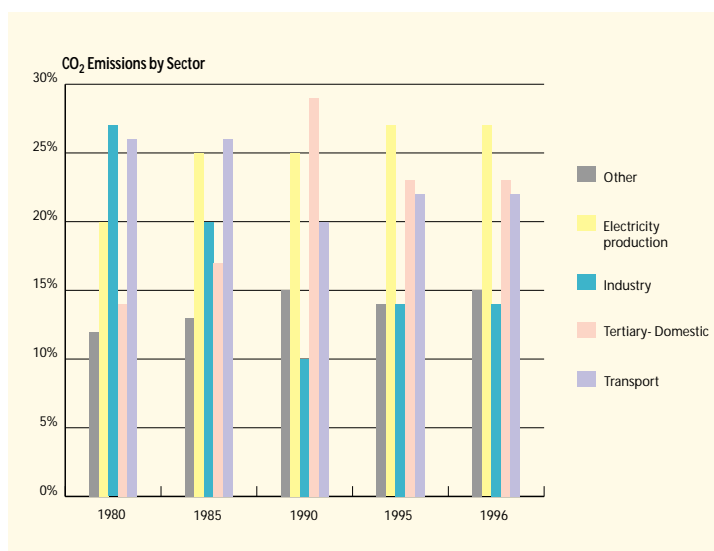
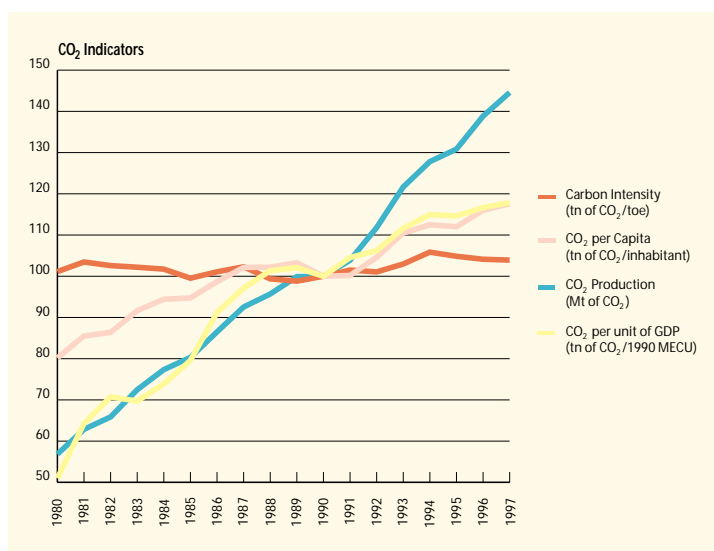
Energy consumption per capita (2.07 Toe/inhabitant) increased at a much slower rate, due to the lower demographic growth experienced in the Middle East (3.5% yearly increase during the 1980s, and 3% since 1990). Since 1980, the domestic and tertiary contribution (0.57 Toe/inhabitant in 1996) has more than doubled due to increasing living standards; that of industry reduced by a quarter, although it started to recover from the early 1990s; while transport consumption per capita has remained stable since 1985. Extreme discrepancies exist between countries, with the highest consumption per capita in the United Arab Emirates (14 toe) and the lowest in Yemen (0.2 toe).



ENVIRONMENT

CO₂ emissions have been increasing by 5.4% per year since 1990...

The **CO₂ emissions** of the Middle East countries have increased regularly by about 5.6% per year since 1980, with an acceleration in the early 1990's. Iran and Saudi Arabia together contributed 59% of the total CO₂ emissions of the region, with an increasing share since 1980 (54%). Power generation, the major contributor with 27% of the emissions in 1996, and industry with 29%, including the energy branch mainly represented by the refinery sector, showed the sharpest increase since 1990 as a result of the region's industrial development being based almost exclusively on oil products and electricity consumption. Emissions from the domestic and tertiary sector, after a considerable increase of more than 14% per year during the 1980's, seem to have stabilised since 1993 and those from transportation since 1994.



The **carbon intensity** (tn CO₂/toe) remained quite stable, confirming the global stability of the fuel mix in the Middle East between 1980 and 1995. **CO₂ emissions per capita** grew on average by 2.2% per year since 1980. Industry's contribution declined sharply during the 1980's in line with industrial production; but it rebounded after 1990 due to new developments. The contribution of transport remained relatively constant since 1980, corresponding to stable motorization in the region but rebounded after 1990 due to new industrial needs. **CO₂ emissions per unit of GDP** increased on average by 5.6% per year since 1980 but this growth rate has slowed continuously to reach only 0.7% a year since 1994.

GLOBAL MARKETS

Despite the financial crisis, Asia remained by far the largest market for oil exports...

The Middle East is the **most important net exporter of energy in the world**. However, this results mainly from exports of crude oil and, to a lesser extent, oil products. Some 80% of the 1062 Mtoe oil produced during 1997 was exported, 87% as crude. The volume of oil exported has increased regularly since 1985 at an average rate of about 6.6% per year although it stabilised between 1993 and 1996. This resulted from a limited increase of world oil consumption between 1992 and 1996, only 1.4% per year on average, combined with additional crude production in industrialised countries as a consequence of the OPEC oil export policy to stabilise oil prices. But cold weather in the United States and Europe, combined with unexpected growth in Asia and Japan despite the financial crisis, caused oil exports to rise by more than 6.7% in 1997, compared to only 2.2% on average between 1990 and 1996. At the same time, Iraqi oil exports restarted with the relaxation of the oil embargo. Asia, excluding Japan, was the foremost importer of oil from the Middle East (accounting for 35% of oil exports from this region) followed by Japan (24%) and Western Europe (21%) - the United States absorbing only 10% of Middle East oil exports.

Gas is presently exported as LNG through facilities in Abu Dhabi, Qatar and Oman. But several pipeline projects to supply gas to Asian countries, such as India and Pakistan, as well as to western European countries with transit via Turkey, have been proposed or are under development.



MIDDLE EAST : SUMMARY ENERGY BALANCE

Mtoe	1980	1985	1990	1995	1996	1997(2)	85/80	90/85	95/90	96/95	97/96
Annual % Change											
Primary Production	999.8	599.0	949.7	1107.7	1127.3	1196.3	-9.7%	9.7%	3.1%	1.8%	6.1%
Solids	0.6	0.8	0.8	0.7	0.6	0.6	6.8%	1.5%	-3.7%	-11.4%	5.2%
Oil	961.4	542.4	862.7	994.7	1003.5	1061.9	-10.8%	9.7%	2.9%	0.9%	5.8%
Natural gas	36.2	53.9	83.7	109.6	120.3	131.0	8.3%	9.2%	5.5%	9.8%	8.8%
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Hydro & Wind	0.8	1.1	1.6	1.8	1.8	1.9	4.8%	9.1%	2.0%	2.1%	1.4%
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Other	0.8	0.9	0.9	1.0	1.0	1.0	2.7%	0.2%	1.3%	0.6%	1.1%
Net Imports	-854.8	-394.6	-701.3	-796.7	-798.9	-853.9	-14.3%	12.2%	2.6%	0.3%	6.9%
Solids	0.0	2.0	2.8	4.9	5.0	5.9	113.9%	6.9%	11.8%	2.2%	18.7%
Oil	-852.5	-394.0	-700.2	-796.2	-798.3	-852.2	-14.3%	12.2%	2.6%	0.3%	6.7%
Crude oil	-812.8	-340.7	-617.0	-700.9	-698.9	na	-16.0%	12.6%	2.6%	-0.3%	na
Oil products	-39.7	-53.3	-83.2	-95.3	-99.5	na	6.1%	9.3%	2.7%	4.4%	na
Natural gas	-2.3	-2.5	-3.8	-5.3	-5.5	-7.5	1.9%	8.7%	6.8%	3.1%	37.2%
Electricity	0.0	0.0	0.0	-0.1	0.0	-0.1	20.6%	1.6%	6.4%	-52.1%	108.8%
Gross Inland Consumption	133.5	191.3	237.2	295.6	315.8	329.3	7.5%	4.4%	4.5%	6.8%	4.3%
Solids	0.6	2.7	3.4	5.2	6.0	6.5	35.0%	5.1%	8.7%	14.9%	8.9%
Oil	97.4	135.3	151.4	183.4	192.2	196.6	6.8%	2.3%	3.9%	4.8%	2.3%
Natural gas	33.9	51.4	79.9	104.3	114.8	123.4	8.7%	9.2%	5.5%	10.1%	7.5%
Other (1)	1.6	1.9	2.5	2.7	2.8	2.8	3.9%	5.3%	1.7%	2.3%	-0.2%
Electricity Generation in TWh	95.6	172.4	237.6	326.8	346.1	na	12.5%	6.6%	6.6%	5.9%	na
Nuclear	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Hydro & wind	9.7	9.6	14.8	15.6	15.8	na	-0.2%	9.1%	1.0%	1.2%	na
Thermal	85.9	162.8	222.8	311.2	330.3	na	13.6%	6.5%	6.9%	6.1%	na
Generation Capacity in GWe	27.0	54.4	72.6	87.1	88.4	na	15.0%	6.0%	3.7%	1.6%	na
Nuclear	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Hydro & wind	1.6	3.0	3.1	4.6	4.6	na	13.1%	1.1%	7.9%	0.0%	na
Thermal	25.4	51.4	69.5	82.5	83.9	na	15.1%	6.2%	3.5%	1.7%	na
Average Load Factor in %	40.4	36.2	37.4	42.8	44.7	na	-2.2%	0.6%	2.8%	4.2%	na
Fuel Inputs for Thermal Power Generation	24.7	41.9	53.2	75.6	79.6	na	11.2%	4.9%	7.3%	5.3%	na
Solids	0.0	1.8	2.4	4.2	4.9	na	-	5.2%	11.8%	18.6%	na
Oil	16.0	27.1	27.9	37.9	39.4	na	11.1%	0.6%	6.3%	4.0%	na
Gas	8.7	13.0	22.9	33.5	35.3	na	8.4%	12.0%	8.0%	5.1%	na
Geothermal	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Average Thermal Efficiency in %	30.0	33.4	36.0	35.4	35.7	na	2.2%	1.5%	-0.3%	0.8%	na
Non-Energy Uses	4.9	9.9	12.2	14.6	15.6	na	14.8%	4.4%	3.6%	6.7%	na
Total Final Energy Demand	87.9	118.6	144.1	188.2	199.0	na	6.2%	4.0%	5.5%	5.7%	na
Solids	0.6	0.8	1.0	1.2	1.2	na	6.9%	4.6%	2.3%	1.9%	na
Oil	66.5	84.1	99.1	121.7	126.0	na	4.8%	3.3%	4.2%	3.5%	na
Gas	13.4	20.0	26.1	40.5	45.7	na	8.3%	5.5%	9.2%	12.8%	na
Electricity	6.7	12.6	16.6	23.3	24.6	na	13.5%	5.8%	7.0%	5.6%	na
Heat	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.8	1.2	1.3	1.4	1.5	na	8.1%	2.0%	2.5%	1.4%	na
CO₂ Emissions in Mt of CO₂	353.8	499.9	622.5	814.4	864.3	900.0	7.2%	4.5%	5.5%	6.1%	4.1%
Indicators											
Population (Million)	91.89	109.92	129.65	151.43	155.20	159.40	3.6%	3.4%	3.2%	2.5%	2.7%
GDP (index 1985=100)	110.4	100.0	99.1	113.1	117.9	121.5	-2.0%	-0.2%	2.7%	4.3%	3.0%
Gross Inl Cons./GDP (toe/1990 MEUR)	355.8	562.8	704.4	768.9	787.7	797.2	9.6%	4.6%	1.8%	2.5%	1.2%
Gross Inl Cons./Capita (toe/inhabitant)	1.45	1.74	1.83	1.95	2.03	2.07	3.7%	1.0%	1.3%	4.2%	1.5%
Electricity Generated/Capita (kWh/inhabitant)	1041	1568	1833	2158	2230	na	8.5%	3.2%	3.3%	3.3%	na
CO ₂ Emissions/Capita (t of CO ₂ /inhabitant)	3.9	4.5	4.8	5.4	5.6	5.6	3.4%	1.1%	2.3%	3.5%	1.4%
Import Dependency (%)	-591.8	-191.1	-282.0	-256.7	-241.8	-245.3	-20.2%	8.1%	-1.9%	-5.8%	1.5%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Estimates



MIDDLE EAST : MAIN INDICATORS										
	1980	1985	1990	1994	1995	1996	85/80	90/85	95/90	96/95
	Annual % Change									
Gross Inland Consumption (Mtoe)	133.5	191.3	237.2	286.1	295.6	315.8	7.5%	4.4%	4.5%	6.8%
Public Thermal Power Generation	23.4	40.6	51.9	71.1	74.1	78.1	11.6%	5.0%	7.4%	5.4%
Autoprod. Thermal Power Generation	1.2	1.3	1.3	1.4	1.4	1.4	0.4%	0.3%	2.3%	0.4%
Energy Branch	16.5	25.0	37.3	44.8	46.4	51.1	8.6%	8.3%	4.5%	10.2%
Final Energy Consumption	87.8	118.5	144.0	184.2	188.1	198.9	6.2%	4.0%	5.5%	5.7%
Industry	35.4	39.0	26.0	44.0	44.8	49.1	2.0%	-7.8%	11.5%	9.6%
Transport	30.1	42.1	41.1	56.6	59.4	60.8	7.0%	-0.5%	7.6%	2.4%
Tertiary-Domestic	22.4	37.4	76.8	83.6	83.9	89.0	10.8%	15.5%	1.8%	6.1%
Energy Intensity (toe/1990 MEUR)	355.8	562.8	704.4	764.2	768.9	787.7	9.6%	4.6%	1.8%	2.5%
Public Thermal Power Generation	62.4	119.5	154.0	189.9	192.8	194.9	13.9%	5.2%	4.6%	1.1%
Autoprod. Thermal Power Generation	3.3	3.7	3.8	3.6	3.7	3.6	2.4%	0.5%	-0.4%	-3.7%
Industry	94.2	114.8	77.3	117.4	116.5	122.4	4.0%	-7.6%	8.5%	5.1%
Transport	80.1	123.8	122.1	151.2	154.4	151.7	9.1%	-0.3%	4.8%	-1.8%
Tertiary-Domestic	59.7	110.0	228.2	223.4	218.2	221.9	13.0%	15.7%	-0.9%	1.7%
Energy per Capita (Kgoe/inhabitant)	1453	1741	1830	1942	1952	2035	3.7%	1.0%	1.3%	4.2%
Industry	385	355	201	298	296	316	-1.6%	-10.8%	8.1%	6.9%
Transport	327	383	317	384	392	392	3.2%	-3.7%	4.3%	-0.1%
Tertiary-Domestic	244	340	593	568	554	573	6.9%	11.7%	-1.3%	3.5%
Electricity Share (%)										
Final Energy Consumption	7.6%	10.6%	11.5%	12.1%	12.4%	12.4%	6.9%	1.7%	1.4%	-0.1%
Industry	4.2%	8.1%	10.2%	8.7%	8.9%	8.7%	14.2%	4.7%	-2.8%	-1.4%
Transport	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	-	-	0.8%	6.8%
Tertiary-Domestic	23.1%	25.1%	18.1%	22.1%	23.0%	22.8%	1.7%	-6.3%	4.9%	-0.9%
Total Renewable Consumption (Mtoe)	1.6	2.0	2.6	2.8	2.8	2.8	4.1%	5.2%	1.7%	1.3%
Hydro	0.8	0.8	1.3	1.3	1.3	1.4	-0.2%	9.1%	1.0%	1.2%
Biomass	0.8	0.9	0.9	1.0	1.0	1.0	3.4%	-0.1%	1.2%	-0.3%
Other	0.0	0.2	0.4	0.4	0.5	0.5	-	9.2%	5.5%	4.9%
Renewable intensity (toe/1990MEUR)	4.3	5.8	7.6	7.4	7.2	7.0	6.2%	5.4%	-0.9%	-2.9%
Renewable per capita (Kgoe/inhabitant)	17.6	18.0	19.7	18.8	18.4	18.2	0.5%	1.8%	-1.4%	-1.2%
CO₂ Emissions (Mt of CO₂)	353.8	499.9	622.5	795.6	814.4	864.3	7.2%	4.5%	5.5%	6.1%
Public Thermal Power Generation	67.3	119.5	149.0	204.6	213.2	225.2	12.2%	4.5%	7.4%	5.6%
Autoprod. Thermal Power Generation	3.8	3.8	3.9	4.1	4.4	4.4	0.4%	0.2%	2.4%	0.4%
Energy Branch	42.6	65.0	95.8	113.5	116.9	128.5	8.8%	8.1%	4.1%	10.0%
Industry	97.1	99.3	64.6	112.9	114.5	125.0	0.5%	-8.2%	12.1%	9.2%
Transport	92.2	129.2	126.1	173.5	182.0	186.4	7.0%	-0.5%	7.6%	2.4%
Tertiary-Domestic	50.8	83.1	183.1	187.0	183.5	194.9	10.3%	17.1%	0.0%	6.2%
Carbon Intensity (tn of CO₂/toe)	2.6	2.6	2.6	2.8	2.8	2.7	-0.3%	0.1%	1.0%	-0.7%
Public Power Generation	2.8	2.9	2.8	2.8	2.8	2.8	0.8%	-0.6%	0.2%	0.3%
Public Thermal Power Generation	2.9	2.9	2.9	2.9	2.9	2.9	0.5%	-0.5%	0.0%	0.2%
Autoprod. Power Generation	3.0	3.0	3.0	3.0	3.0	3.0	0.0%	0.0%	0.1%	0.0%
Autoprod. Thermal Power Generation	3.0	3.0	3.0	3.0	3.0	3.0	-0.1%	0.0%	0.1%	0.0%
Energy Branch	2.6	2.6	2.6	2.5	2.5	2.5	0.2%	-0.2%	-0.4%	-0.2%
Industry	2.7	2.5	2.5	2.6	2.6	2.5	-1.5%	-0.5%	0.6%	-0.4%
Transport	3.1	3.1	3.1	3.1	3.1	3.1	0.0%	0.0%	0.0%	0.0%
Tertiary-Domestic	2.3	2.2	2.4	2.2	2.2	2.2	-0.4%	1.4%	-1.7%	0.1%
CO₂ per Capita (kg of CO₂/inhabitant)	3850	4548	4801	5401	5378	5569	3.4%	1.1%	2.3%	3.5%
Industry	1056	904	499	766	756	805	-3.1%	-11.2%	8.7%	6.5%
Transport	1004	1175	973	1178	1202	1201	3.2%	-3.7%	4.3%	-0.1%
Tertiary-Domestic	553	756	1412	1270	1212	1256	6.5%	13.3%	-3.0%	3.6%
CO₂ per unit of GDP (tn of CO₂/1990 MEUR)	943	1470	1848	2125	2118	2156	9.3%	4.7%	2.8%	1.8%
Public Thermal Power Generation	179	351	442	546	554	562	14.4%	4.7%	4.6%	1.3%
Autoprod. Thermal Power Generation	10	11	12	11	11	11	2.4%	0.4%	-0.3%	-3.8%
Energy Branch	114	191	284	303	304	321	11.0%	8.3%	1.3%	5.5%
Industry	259	292	192	302	298	312	2.5%	-8.1%	9.2%	4.7%
Transport	246	380	374	463	473	465	9.1%	-0.3%	4.8%	-1.8%
Tertiary-Domestic	135	244	544	500	477	486	12.6%	17.3%	-2.6%	1.8%



SAUDI ARABIA : SUMMARY ENERGY BALANCE

Mtoe	1980	1985	1990	1995	1996	1997(2)	85/80	90/85	95/90	96/95	97/96
Annual % Change											
Primary Production	533.1	200.8	368.8	470.7	475.0	494.4	-17.7%	12.9%	5.0%	0.9%	4.1%
Solids	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Oil	524.6	185.0	343.4	437.8	439.2	456.9	-18.8%	13.2%	5.0%	0.3%	4.0%
Natural gas	8.5	15.8	25.4	32.9	35.8	37.5	13.1%	10.0%	5.4%	8.7%	4.8%
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Hydro & Wind	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Other	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Net Imports	-493.7	-139.8	-303.7	-385.2	-380.9	-396.8	-22.3%	16.8%	4.9%	-1.1%	4.2%
Solids	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Oil	-493.7	-139.8	-303.7	-385.2	-380.9	-396.9	-22.3%	16.8%	4.9%	-1.1%	4.2%
Crude oil	-484.6	-124.0	-253.7	-342.2	-332.3	na	-23.9%	15.4%	6.2%	-2.9%	na
Oil products	-9.1	-15.8	-50.0	-43.0	-48.6	na	11.7%	25.9%	-3.0%	12.9%	na
Natural gas	0.0	0.0	0.0	0.0	0.0	0.1	-	-	-	-	-
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Gross Inland Consumption	35.4	52.2	63.3	83.7	92.2	95.3	8.1%	3.9%	5.7%	10.3%	3.4%
Solids	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Oil	26.8	36.5	37.9	50.7	56.4	57.8	6.3%	0.8%	6.0%	11.3%	2.3%
Natural gas	8.5	15.8	25.4	32.9	35.8	37.6	13.1%	10.0%	5.4%	8.7%	5.0%
Other (1)	0.0	0.0	0.0	0.0	0.0	0.0	14.8%	34.5%	-2.7%	-58.0%	-100.0%
Electricity Generation in TWh	20.5	44.3	64.9	93.9	97.8	na	16.7%	7.9%	7.7%	4.2%	na
Nuclear	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Hydro & wind	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Thermal	20.5	44.3	64.9	93.9	97.8	na	16.7%	7.9%	7.7%	4.2%	na
Generation Capacity in GWe	7.4	15.9	19.7	20.9	21.1	na	16.4%	4.4%	1.3%	0.8%	na
Nuclear	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Hydro & wind	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Thermal	7.4	15.9	19.7	20.9	21.1	na	16.4%	4.4%	1.3%	0.8%	na
Average Load Factor in %	31.4	31.9	37.7	51.2	52.9	na	0.3%	3.4%	6.3%	3.4%	na
Fuel Inputs for Thermal Power Generation	4.1	10.7	13.0	20.0	21.0	na	21.3%	3.9%	9.1%	5.1%	na
Solids	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Oil	3.4	7.3	8.7	13.5	14.6	na	16.4%	3.6%	9.1%	8.0%	na
Gas	0.6	3.4	4.2	6.5	6.5	na	39.1%	4.5%	9.0%	-0.8%	na
Geothermal	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Average Thermal Efficiency in %	43.2	35.6	43.0	40.3	40.0	na	-3.8%	3.9%	-1.3%	-0.9%	na
Non-Energy Uses	0.9	4.8	4.2	5.5	5.8	na	38.2%	-2.3%	5.5%	4.2%	na
Total Final Energy Demand	22.3	26.5	38.3	43.5	46.6	na	3.5%	7.7%	2.6%	7.2%	na
Solids	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Oil	21.0	22.3	25.0	26.5	28.4	na	1.2%	2.4%	1.1%	7.3%	na
Gas	0.3	1.1	9.0	10.7	11.6	na	33.5%	52.9%	3.5%	8.7%	na
Electricity	1.1	3.1	4.3	6.4	6.6	na	23.5%	6.6%	8.1%	4.2%	na
Heat	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.0	0.0	0.0	0.0	0.0	na	14.8%	34.5%	-2.7%	-58.0%	na
CO₂ Emissions in Mt of CO₂	95.3	128.7	179.5	217.6	234.0	na	6.2%	6.9%	3.9%	7.5%	na
Indicators											
Population (Million)	9.37	12.38	15.80	18.98	19.41	19.97	5.7%	5.0%	3.7%	2.3%	2.9%
GDP (index 1985=100)	134.8	100.0	120.8	135.0	140.4	143.1	-5.8%	3.8%	2.3%	4.0%	1.9%
Gross Inl Cons./GDP (toe/1990 MEUR)	385.3	766.8	769.6	910.1	964.8	978.7	14.8%	0.1%	3.4%	6.0%	1.4%
Gross Inl Cons./Capita (toe/inhabitant)	3.77	4.22	4.00	4.41	4.75	4.77	2.3%	-1.0%	1.9%	7.8%	0.4%
Electricity Generated/Capita (kWh/inhabitant)	2182	3580	4107	4947	5040	na	10.4%	2.8%	3.8%	1.9%	na
CO ₂ Emissions/Capita (t of CO ₂ /inhabitant)	10.2	10.4	11.4	11.5	12.1	na	0.4%	1.8%	0.2%	5.2%	na
Import Dependency (%)	-1246.7	-229.4	-466.8	-450.4	-404.8	-402.8	-28.7%	15.3%	-0.7%	-10.1%	-0.5%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Estimates



IRAN : SUMMARY ENERGY BALANCE											
Mtoe	1980	1985	1990	1995	1996	1997(2)	85/80	90/85	95/90	96/95	97/96
	Annual % Change										
Primary Production	84.0	127.7	180.6	217.1	220.9	224.4	8.7%	7.2%	3.7%	1.8%	1.6%
Solids	0.6	0.8	0.8	0.6	0.6	0.6	6.8%	0.8%	-4.3%	-11.5%	5.6%
Oil	75.9	113.9	158.9	186.4	187.3	186.7	8.5%	6.9%	3.2%	0.5%	-0.3%
Natural gas	6.5	11.9	19.8	28.7	31.7	35.7	12.8%	10.6%	7.7%	10.5%	12.7%
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Hydro & Wind	0.5	0.5	0.5	0.6	0.6	0.6	-0.2%	1.9%	3.6%	1.4%	1.3%
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Other	0.6	0.7	0.7	0.7	0.7	0.7	3.6%	0.0%	1.0%	0.4%	0.8%
Net Imports	-44.0	-72.0	-106.4	-132.7	-129.6	-128.4	10.4%	8.1%	4.5%	-2.3%	-0.9%
Solids	0.0	0.1	0.2	0.3	0.4	0.4	10.8%	32.0%	4.6%	16.5%	7.2%
Oil	-43.9	-72.1	-105.4	-132.9	-129.9	-128.8	10.4%	7.9%	4.7%	-2.2%	-0.8%
Crude oil	-38.2	-77.0	-112.1	-129.5	-127.0	na	15.1%	7.8%	2.9%	-1.9%	na
Oil products	-5.7	4.9	6.7	-3.4	-2.9	na	-	6.2%	-	-15.9%	na
Natural gas	-0.2	0.0	-1.2	-0.1	-0.1	0.0	-	-	-41.8%	0.0%	-
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Gross Inland Consumption	38.9	54.1	71.6	82.5	89.3	94.3	6.8%	5.8%	2.9%	8.3%	5.6%
Solids	0.6	0.8	1.0	0.9	0.9	1.0	7.1%	4.7%	-1.9%	-2.4%	6.2%
Oil	30.9	40.2	50.8	51.6	55.5	56.2	5.4%	4.8%	0.3%	7.5%	1.4%
Natural gas	6.4	11.9	18.5	28.6	31.6	35.7	13.4%	9.2%	9.1%	10.5%	13.0%
Other (1)	1.1	1.2	1.2	1.3	1.4	1.4	1.9%	0.8%	2.2%	0.9%	1.1%
Electricity Generation in TWh	22.4	39.2	59.1	85.0	90.9	na	11.9%	8.5%	7.5%	6.9%	na
Nuclear	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Hydro & wind	5.6	5.6	6.1	7.3	7.4	na	-0.2%	1.9%	3.6%	1.4%	na
Thermal	16.8	33.7	53.0	77.7	83.5	na	15.0%	9.5%	7.9%	7.4%	na
Generation Capacity in GWe	5.3	13.4	17.6	26.3	26.8	na	20.4%	5.5%	8.4%	1.9%	na
Nuclear	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Hydro & wind	0.9	1.8	1.8	2.5	2.5	na	16.2%	0.0%	6.7%	0.0%	na
Thermal	4.5	11.6	15.8	23.8	24.3	na	21.1%	6.3%	8.6%	2.1%	na
Average Load Factor in %	48.2	33.4	38.4	36.9	38.8	na	-7.1%	2.8%	-0.8%	5.0%	na
Fuel Inputs for Thermal Power Generation	4.5	8.9	12.6	18.2	19.1	na	14.9%	7.2%	7.6%	4.6%	na
Solids	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Oil	3.0	7.0	6.3	8.1	8.5	na	18.3%	-2.2%	5.4%	4.5%	na
Gas	1.4	1.9	6.4	10.1	10.5	na	5.9%	27.0%	9.6%	4.6%	na
Geothermal	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Average Thermal Efficiency in %	32.4	32.5	36.1	36.7	37.7	na	0.1%	2.1%	0.3%	2.7%	na
Non-Energy Uses	1.3	1.4	5.0	6.1	6.8	na	2.1%	28.9%	3.9%	10.4%	na
Total Final Energy Demand	28.5	43.1	47.7	73.8	80.4	na	8.6%	2.1%	9.1%	9.0%	na
Solids	0.6	0.8	1.0	1.0	1.0	na	7.1%	4.4%	0.2%	0.0%	na
Oil	20.8	28.8	36.2	46.3	48.9	na	6.8%	4.6%	5.0%	5.7%	na
Gas	4.9	10.0	6.0	20.2	23.9	na	15.3%	-9.8%	27.7%	18.2%	na
Electricity	1.7	2.8	3.9	5.6	5.9	na	11.0%	6.8%	7.6%	5.5%	na
Heat	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.6	0.7	0.7	0.7	0.7	na	3.6%	0.0%	1.0%	0.4%	na
CO₂ Emissions in Mt of CO₂	97.2	148.9	173.2	256.3	276.2	na	8.9%	3.1%	8.1%	7.8%	na
Indicators											
Population (Million)	39.12	46.37	53.73	61.18	62.51	63.97	3.5%	3.0%	2.6%	2.2%	2.3%
GDP (index 1985=100)	75.6	100.0	96.4	120.6	126.6	130.7	5.8%	-0.7%	4.6%	5.0%	3.2%
Gross Inl Cons./GDP (toe/1990 MEUR)	524.9	551.5	757.4	697.0	719.2	735.6	1.0%	6.6%	-1.6%	3.2%	2.3%
Gross Inl Cons./Capita (toe/inhabitant)	0.99	1.17	1.33	1.35	1.43	1.47	3.2%	2.7%	0.2%	6.0%	3.1%
Electricity Generated/Capita (kWh/inhabitant)	572	846	1100	1389	1453	na	8.1%	5.4%	4.8%	4.6%	na
CO ₂ Emissions/Capita (t of CO ₂ /inhabitant)	2.5	3.2	3.2	4.2	4.4	na	5.3%	0.1%	5.4%	5.5%	na
Import Dependency (%)	-108.8	-129.3	-143.3	-157.2	-142.1	-132.6	3.5%	2.1%	1.9%	-9.6%	-6.6%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Estimates

