

Energy: a key sector for the Mediterranean partner countries

The energy sector is a lynchpin of the Euro-Mediterranean partnership. Reinforcing the Mediterranean's energy infrastructures (interconnecting electricity and gas networks; planned refineries and pipelines; electricity and natural gas production projects), trade between the Mediterranean partner countries (MPCs) and the European Union and, above all, liberalisation of the energy sector in the Mediterranean countries all require a level of monitoring that can only be ensured by energy statistics compiled to international standards.

Significant differences between the MPCs in terms of energy

Bringing energy balances into line with international standards is a key objective for the nine Mediterranean partner countries (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, the occupied Palestinian territory, Syria and Tunisia). According to initial data collected for 2005, the gross inland energy consumption, i.e. the primary energy needs of these nine countries is almost 175 million tonnes of oil equivalent (Mtoe) (around 3.5 million barrels of oil equivalent per day) or almost 59% of total primary energy production in the region. The significant differences between the MPCs in terms of energy should be mentioned here. Three categories of countries can be distinguished:

(i) producer countries, comprising Algeria, Egypt and Syria, which have abundant fossil fuel deposits (oil and natural gas) and whose total exports are 144 Mtoe, 21 Mtoe and 12 Mtoe respectively; (ii) consumer countries, such as Israel, Jordan, Lebanon, Morocco and the occupied Palestinian territory; and (iii) one intermediate country – Tunisia.

Energy supply

Primary production centred on oil and natural gas

Fossil fuels account for 99% of the primary energy produced in the MPCs: 52% crude oil and natural gas liquids (NGL) and 47% natural gas. The proportion provided by renewable sources of energy, including hydroelectricity, is very low (about 1% of total production).

Crude oil and NGL production is made up of about 126 Mtoe of crude, 17 Mtoe of condensate as well as 10 Mtoe of naturally occurring NGL.

Four countries account for the production of total primary energy: two major producers, Algeria and Egypt, producing 61% and 27% respectively, and two others with a more modest production of 9% (Syria) and 2% (Tunisia) (*Figure 1*).

Figure 1: Breakdown of total primary energy production of the MPCs, 2005

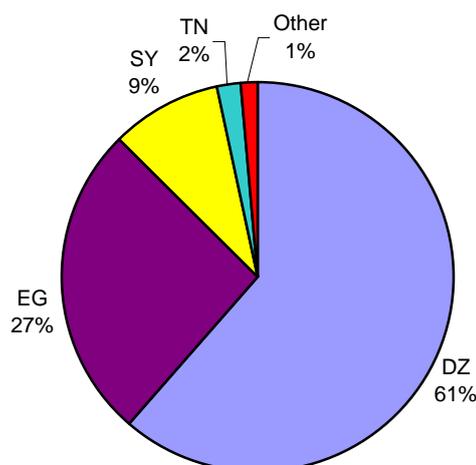


Table 1: Primary energy production of the MPCs, 2005 (ktoe)

	Coal ⁽¹⁾	Crude oil and NGL	Natural gas and LNG	Renewables ⁽²⁾	Hydro-electricity	TOTAL
DZ	-	94 451	85 166	77	48	179 741
EG	1 414	32 476	43 299	48	1 087	78 325
IL	43	2	1 681	724	-	2 450
JO	-	1	179	68	5	252
LB	-	-	-	134	90	224
MA	8	7	38	567	121	742
PS	-	-	-	227	-	227
SY	-	21 869	4 755	-	296	26 921
TN	-	3 479	2 099	4	12	5 594
MPCs	1 465	152 285	137 217	1 849	1 660	294 476

Notes: (1) Lignite for IL. (2) Biomass for DZ; wind for EG, MA and TN; solar for IL; wind and solar for JO; biomass and solar for LB; biomass, solar and geothermal for PS.

Trends in primary production by type of energy

Production of crude oil and natural gas liquids (NGLs):

Overall, the MPCs produce far more hydrocarbons than they consume. Crude oil production in Algeria has grown rapidly over the past ten years because of the exploitation of new fields. The increase over the period 1995 to 2005 was in the order of 53% (*Figure 2*). However, output in Egypt and Syria is declining: these countries accounted for only 21% and 14% respectively of the MPCs' production in 2005, compared to 26% and 20% in 2000 and 29% and 23% in 1995.

Production of natural gas: Production of natural gas in the MPCs has risen sharply, doubling between 1995 and 2005 (*Figure 3*). This concerns not only the main producers of the region (Algeria, Egypt and Syria) but also the small-scale producers such as Tunisia and Israel. This has been possible thanks to the exploitation of many gas fields, mainly offshore: the Nile Delta in Egypt, Gaza and Ashkelon in Israel and the Gulf of Gabès in Tunisia.

Trade in energy

Exports: The main energy products exported from the MPCs are crude oil and NGL (43%), natural gas (including liquefied natural gas) (40%) and petroleum products (17%) (*Table 2*).

Algeria is the major energy exporter in the region, accounting for almost 82% of all natural gas exports, 80% of crude oil and NGL exports and 58% of petroleum products exports. The vast majority of gas exported goes to other Mediterranean countries (Italy, Spain, France, Turkey, Greece, Slovenia, Tunisia, Morocco).

Figure 2: Crude oil and NGL production (ktoe)

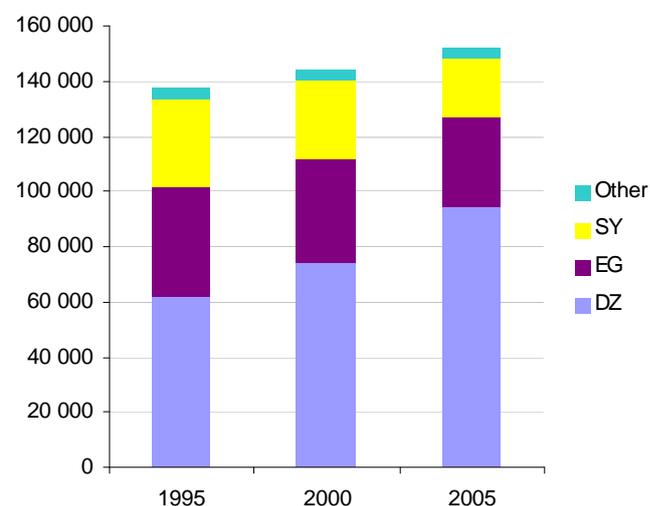


Figure 3: Natural gas production (ktoe)

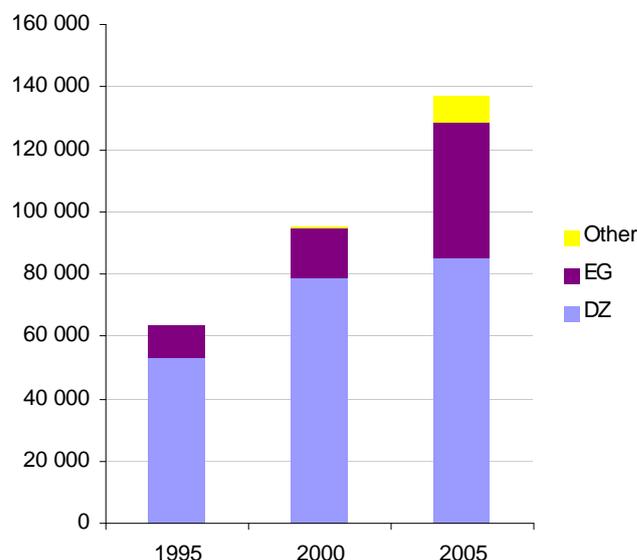


Table 2: Energy exports of the MPCs, 2005 (ktoe)

	Coal	Crude oil and NGL	Natural gas and LNG	Petroleum products	Electricity	TOTAL
DZ	-	64 671	61 208	18 488	24	144 391
EG	246	2 551	13 004	5 610	81	21 492
IL	-	-	-	3 868	143	4 011
JO	-	-	-	-	-	-
LB	-	-	-	-	-	-
MA	-	-	-	1 378	-	1 378
PS	-	-	-	-	-	-
SY	-	10 284	-	1 905	73	12 262
TN	-	2 900	519	707	3	4 130
MPCs	246	80 406	74 731	31 956	324	187 663

Imports: Three countries account for 83% of total crude oil and NGL imports to the MPCs: Israel (39%), Morocco (26%) and Jordan (17%). All the natural gas imported goes to just three countries: Tunisia (52%), Jordan (37%) and Morocco (11%) (Table 3). This allows them to diversify their energy supply and to reduce their dependence on oil, as well as contributing to their various energy efficiency programmes.

The main petroleum products imported are gasoil/diesel (11.2 Mtoe or 41% of the total), fuel oil (5.7 Mtoe or 21%) and gasoline (2.4 Mtoe or 9%). These are intended for the domestic market to cover mainly the needs of the transport and household sectors.

A large proportion of the 12.4 Mtoe of imported coal is destined for electricity production in Israel (65%) and Morocco (26%). The remainder is used mainly to cover the needs of the Egyptian and Algerian steel industries (5% and 3%, respectively).

Trade in electricity in this region remains fairly modest, with total imports of just 0.5 Mtoe and exports of 0.3 Mtoe.

Energy dependence

Energy dependence is defined as the percentage of gross inland energy consumption that is met by imports. The MPC region on the whole produces 68% more energy than it consumes and is thus a net exporter. However, energy dependence rates approaching 100% for 2005 should be noted for certain countries, such as Israel (91%), Jordan (99.9%), Lebanon (95%), Morocco (94%) and the occupied Palestinian territory (85%).

Figure 4: Energy dependence rate, 2005 (%)

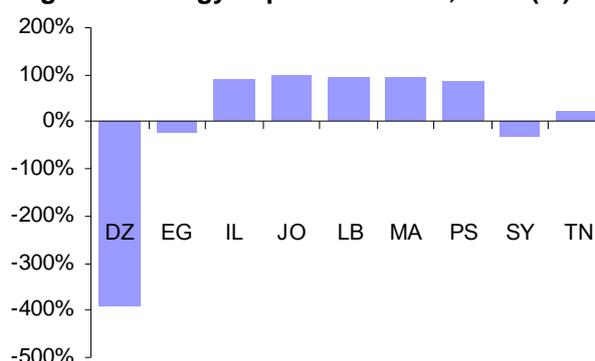


Table 3: Energy imports of the MPCs, 2005 (ktoe)

	Coal	Crude oil and NGL	Natural gas and LNG	Petroleum products	Electricity	TOTAL
DZ	577	325	-	150	31	1 082
EG	415	2 491	-	3 369	14	6 290
IL	8 036	10 382	-	5 361	-	23 778
JO	-	4 607	1 205	1 114	84	7 010
LB	103	-	-	4 490	39	4 633
MA	3 251	6 993	340	3 258	70	13 912
PS	-	-	-	1 085	246	1 332
SY	-	486	-	5 259	-	5 746
TN	-	1 144	1 676	3 102	-	5 922
MPCs	12 382	26 428	3 221	27 189	485	69 705

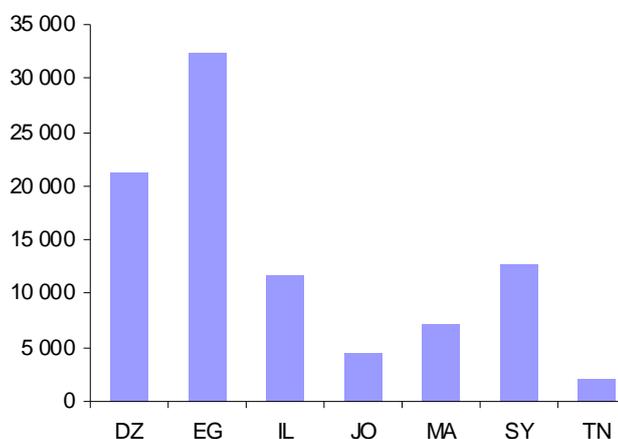
Energy transformation

Refineries

The distribution of refining capacity by country is roughly similar to the distribution of consumption, with the following exceptions: i) Lebanon and the occupied Palestinian territory have no refining facilities and ii) Algeria and Egypt have a capacity which is greater than their internal demand, reflecting their policy of exporting refined products.

For 2005, the total refining capacity of the MPCs was approximately 2.1 million barrels/day, or around 107 Mtoe a year. Input of crude oil to refineries in 2005 was 92 Mtoe, meaning that, on average, the refineries of the MPCs operated at 86% of their capacity.

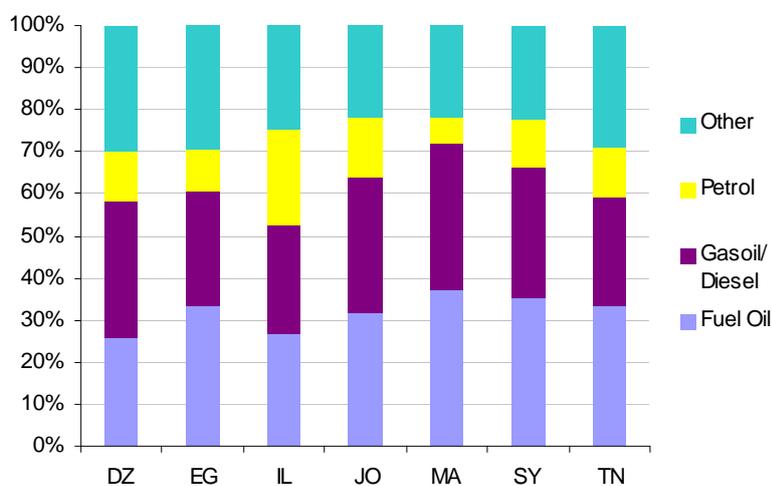
Figure 5: Input of crude oil to refineries in the MPCs, 2005 (ktoe)



A large proportion of the crude oil is transformed into fuel oil (27 189 ktoe or 31% of the total), gasoil/diesel (26 051 ktoe or 30%) and petrol (10 607 ktoe or 12%).

Egypt produces the largest quantity of refined products – 36% of the total production of the region - followed by Algeria at 22% and then by Syria and Israel at 14% and 13%, respectively.

Figure 6: Refinery production in the MPCs, 2005 (%)



Power stations

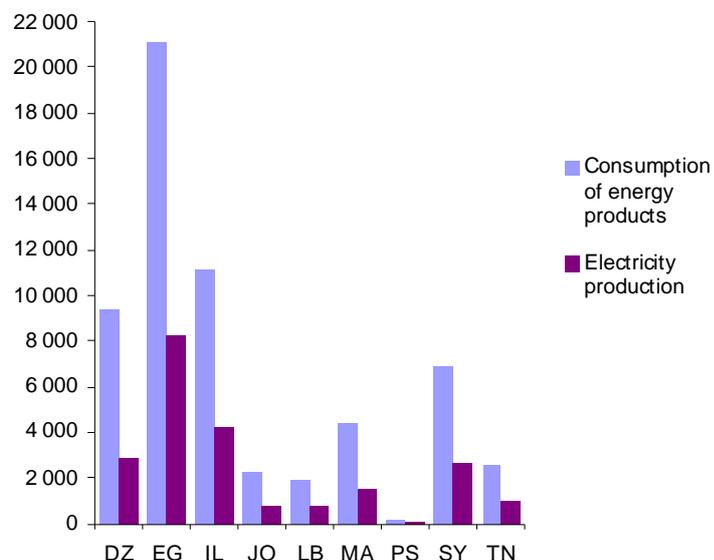
Electricity production in the MPCs is around 22 Mtoe, of which 97% comes from conventional thermal power stations and just 3% from hydroelectric plants. Renewable energy (not including hydroelectricity) accounts for no more than 0.1%.

The main sources of energy used in the power stations are, in ascending order: coal (18%), petroleum products (23%) and natural gas, the share of which is increasing steadily (59%).

It should be noted that the average efficiency of the conventional power plants is around 37%, which is normal.

Four countries account for almost 81% of the electricity generated: Egypt (37%), Israel (19%), Algeria (13%) and Syria (12%). Average electricity production per capita in the region is around 0.12 toe (Egypt 0.12 toe, Israel 0.60 toe, Algeria 0.09 toe and Syria 0.14 toe).

Figure 7: Consumption and production of power stations in the MPCs, 2005 (ktoe)



Final consumption of energy

The total amount of energy consumed by end users (final energy consumption) in the MPCs in 2005 was 109.6 Mtoe. Almost 68% of this was consumed in just three countries: 38% in Egypt, 17% in Algeria and 13% in Syria. Average energy consumption per capita for these countries is of the order of 0.60 toe (0.58 toe in Egypt, 0.57 toe in Algeria and 0.79 toe in Syria).

Figure 9 illustrates the structure of consumption in the nine MPCs. Industry accounts for 30% of final energy consumption, transport for 29% and the other sectors (households, services, public administration and agriculture) for 41%. It should be noted that energy consumption by industry is most important in Egypt, whilst in Israel, Jordan and Lebanon, transport is more important. In all other MPCs, however, the other sectors (households, services, public administration and agriculture) have the highest share in final energy consumption.

Figure 8: Breakdown of final energy consumption, 2005

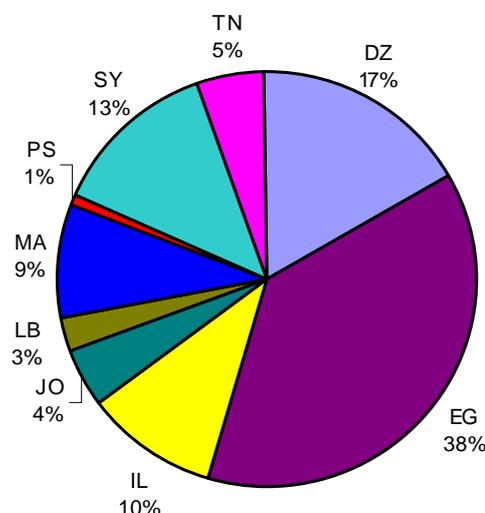
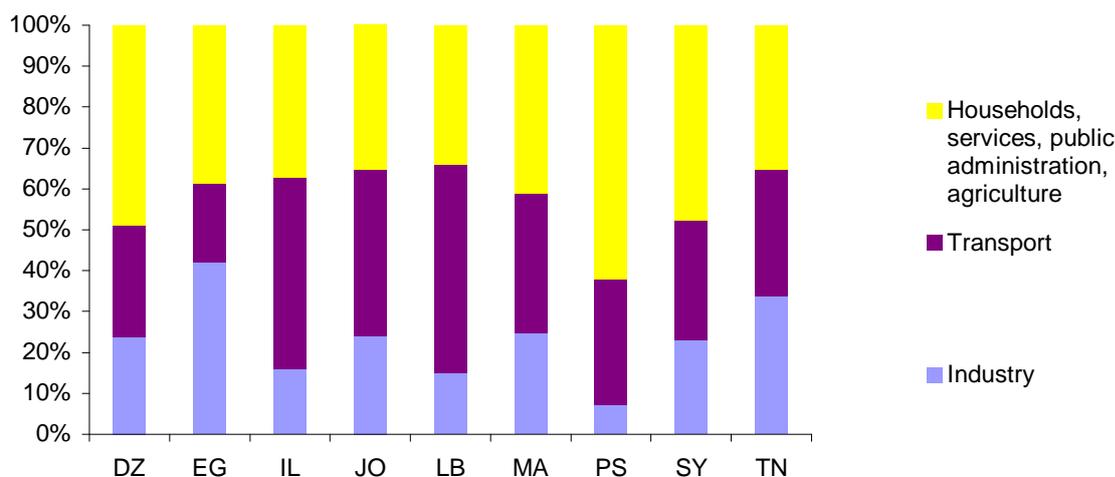


Figure 9: Breakdown of final energy consumption by sector, 2005 (%)



The consumption of energy by industry is accounted for largely by specific sectors which use huge amounts of energy, in particular the iron and steel, chemicals, engineering products and construction materials sectors. The main energy products used are (i) natural gas (31%), (ii) petroleum products (45%), particularly refinery gas, fuel oil and gasoil, (iii) electricity (20%), and to a far lesser extent, coal (4%).

In the transport sector, 84% of energy use is in road transport. The proportion used by air transport is about 12%.

The amount of energy consumed by the agriculture sector was around 7% of total final energy consumption in 2005, while households consumed 15%, mainly petroleum products (LPG and gasoil/diesel at 41%), electricity (29%) and natural gas (24%).

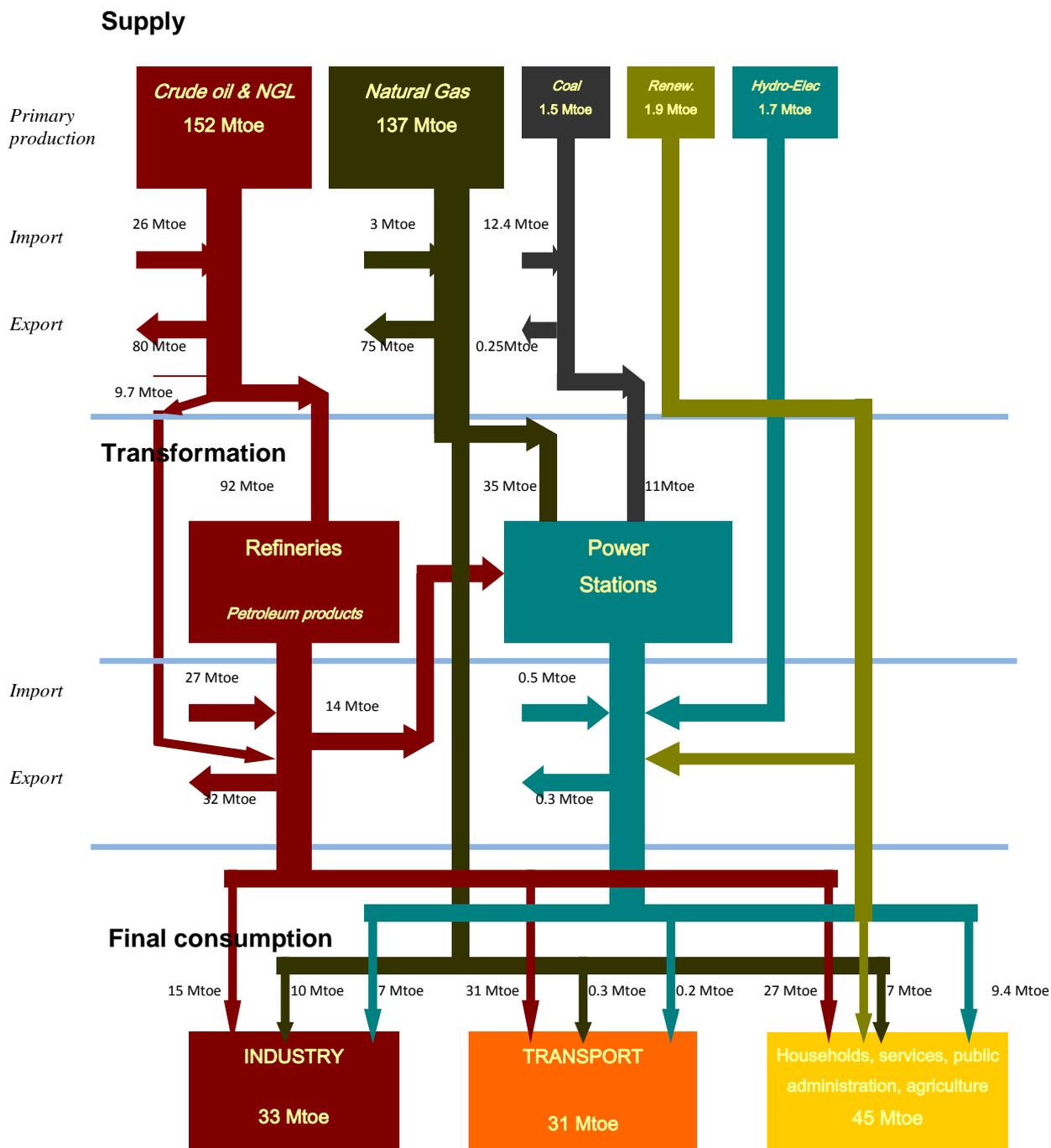
Main energy flows in the MPCs

The figure below gives an overview of the energy flows in the MPCs. On the supply side, a distinction can be made between production, import and export of primary products. For example, in the case of crude oil, the figures are 152 Mtoe, 26 Mtoe and 80 Mtoe respectively.

Transformation refers to the products used in the main transformation processes, primarily in refineries and power stations.

Lastly, final consumption essentially covers the sectors of industry, transport and other residential and tertiary sectors.

Figure 10: The main energy flows in the MPCs, 2005



ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

The **tonne of oil equivalent (toe)** is a conventional standardised unit of energy defined on the basis of a tonne of oil with a net calorific value of 41 868 kilojoules/kg.

Mtoe = million toe

ktoe = thousand toe

Energy supply

Primary production: refers to primary fuels extracted from fossil reserves as well as biofuels and renewable energy captured from water, wind, sunlight, etc.

Production of crude oil and natural gas liquids (NGLs): quantities of crude oil, natural gas liquids, condensates and heavy oil extracted from oil shale and tar sands, etc. within the national boundaries, including offshore production. Production covers only commercial production, not including any volumes reinjected into the fields.

Production of natural gas: commercial gas production within national boundaries, including offshore production. Volumes are measured after purification and extraction of NGLs and sulphur. Any quantities reinjected, extraction losses and any quantities burnt off or released into the atmosphere are not included.

Production includes the quantities of gas used directly in the gas industry, i.e. those used for gas extraction, in gas pipeline networks/compression stations, in natural gas treatment plants and any other quantities entering liquefaction plants (liquefied natural gas - LNG).

Gross inland energy consumption: refers to the total supply of primary energy required to meet the needs of the country. It is the result of the following calculation: production + imports – exports – international maritime bunkers ± changes in stocks.

Trade in energy: refers to imports and exports. It includes primary energy and derived energy products which have crossed the national borders of a country, whether or not customs clearance has taken place.

Energy dependence rate: the ratio (expressed as a percentage) of net imports of energy (imports - exports) to gross inland consumption.

Energy transformation

Refinery output: this is the production of LPG (liquefied petroleum gas), motor spirit, kerosene, jet fuels, gas/diesel oil, residual fuel oil and other petroleum products.

Energy consumption by power stations (input): this refers to fossil fuels burnt in thermal power stations, including combined heat and power plants.

Electricity production is the total gross electricity production of a country, including therefore the electricity used by substations and by the power stations themselves.

Final consumption of energy:

This is consumption by final users: industry (not including the energy sector), transport and others (households, services, public administration, agriculture, etc.).

The consumption of energy in industry refers to consumption in all sectors of industry, except the energy sector itself.

The Mediterranean partner countries

DZ : Algeria

EG : Egypt

IL : Israel

JO : Jordan

LB : Lebanon

MA : Morocco

PS : occupied Palestinian territory

SY : Syria

TN : Tunisia

This document has been prepared with the co-operation of Mr. Abdelaziz BOURAHLA, energy expert for MEDSTAT II, the EU-funded regional Euro-Mediterranean Statistical Cooperation programme.

MEDSTAT II started in January 2006 and seeks to:

- harmonise statistical methods in the Mediterranean partner countries, in line with European and international conventions and standards;
- improve the comparability of data between the partner countries and with those of EU Member States and EFTA countries;
- improve the quality of services offered to users by the national statistical institutes and their partner organisations involved in the production of statistics.

Special attention is paid to **nine sectors**: trade in goods and services, national accounts, social statistics, energy, agriculture (including fisheries), environment, tourism, transport and migration.

MEDSTAT website: <http://ec.europa.eu/eurostat/medstat>

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