



AFRICAN UNION

**AFRICAN ENERGY COMMISSION
COMMISSION AFRICAINE DE L'ENERGIE
COMISSAO AFRICANA D'ENERGIA
اللجنة الأفريقية للطاقة**



AFREC

**KEY AFRICA
ENERGY STATISTICS**



Oil



Coal



Electricity



Firewood



E D I T I O N
2 0 1 7

KEY AFRICA ENERGY STATISTICS

List of Participating African Countries

| | |
|-------------------|---------------------|
| Algeria | Madagascar |
| Angola | Malawi |
| Benin | Mali |
| Botswana | Mauritania |
| Burkina Faso | Mauritius |
| Burundi | Morocco |
| Cameroon | Mozambique |
| Cape Verde | Namibia |
| Central Africa | Niger |
| Chad | Nigeria |
| Comoros | Rwanda |
| Congo | Saharawi Republic |
| Congo DR | Somalia |
| Cote d'Ivoire | São Tome & Principe |
| Djibouti | Senegal |
| Egypt | Seychelles |
| Equatorial Guinea | Sierra Leone |
| Eritrea | South Africa |
| Ethiopia | South Sudan |
| Gabon | Sudan |
| Gambia | Swaziland |
| Ghana | Tanzania |
| Guinea | Togo |
| Guinea Bissau | Tunisia |
| Kenya | Uganda |
| Lesotho | Zambia |
| Liberia | Zimbabwe |
| Libya | |

FORWARD

This is the 2017 publication of “Key Africa Energy Statistics” following the 2016, 2015, 2014, 2013 and 2012 edition produced by the African Energy Commission (AFREC). It provides a time series data of energy supply, transformation, consumption and energy balances of all African countries.

This handy, pocket-sized publication represents a summary of the main volume of the “Africa Energy Statistics 2017” which provides timely and clearly-presented data of the Africa’s energy supply and use in most cases from 2 000 to 2 015.

The Africa Energy Statistics is intended to become the Africa’s major and most authoritative source of energy statistics and reflects the real situation of the management of oil, natural gas, coal, electricity and renewable energy resources and products in the continent.

As mentioned in the main Africa Energy Statistics 2017 report, a mandate was given to AFREC by its Convention to design, create and update a continental energy data base and facilitate rapid dissemination of information and exchange of information among Member States as well as among the African Regional Economic Communities (RECs) and other agencies and institutions.

Along with this copy of hard version a complementary CD-ROM, USB flash drive and Internet versions have been produced. The main report of the Africa Energy Statistics 2017 presents the full time series of energy data for each African nation, each region and the whole continent.

It is our expectation that the statistics contained in this publications will prove to be useful to wide range of end-users including energy analysts, planners, policy makers, researchers and academics in Africa and around the world.

AFREC welcomes any feedback by way of comments and suggestions from the readers and end-users.

This publication is available on the AFREC’s website www.afrec-energy.org.

Unit Abbreviations

(Source: IEA)

| | |
|--------------|--------------------------------------|
| bcm | billion cubic metres |
| Gcal | gigacalorie |
| GCV | gross calorific value |
| GW | gigawatt |
| GWh | gigawatt hour |
| kb/cd | thousand barrels per calendar day |
| kcal | kilocalorie |
| kg | kilogramme |
| kJ | kilojoule |
| kWh | Kilowatt hour |
| MBtu | million British thermal units |
| Mt | million tonnes |
| Mtoe | million tonnes of oil equivalent |
| PPP | Purchasing Power Parity |
| t | metric ton=tonne=1000kg |
| kt | kilotonnes |
| TJ | terajoule |
| toe | tonne of oil equivalent= 10^7 kcal |
| TWh | terawatt hour |

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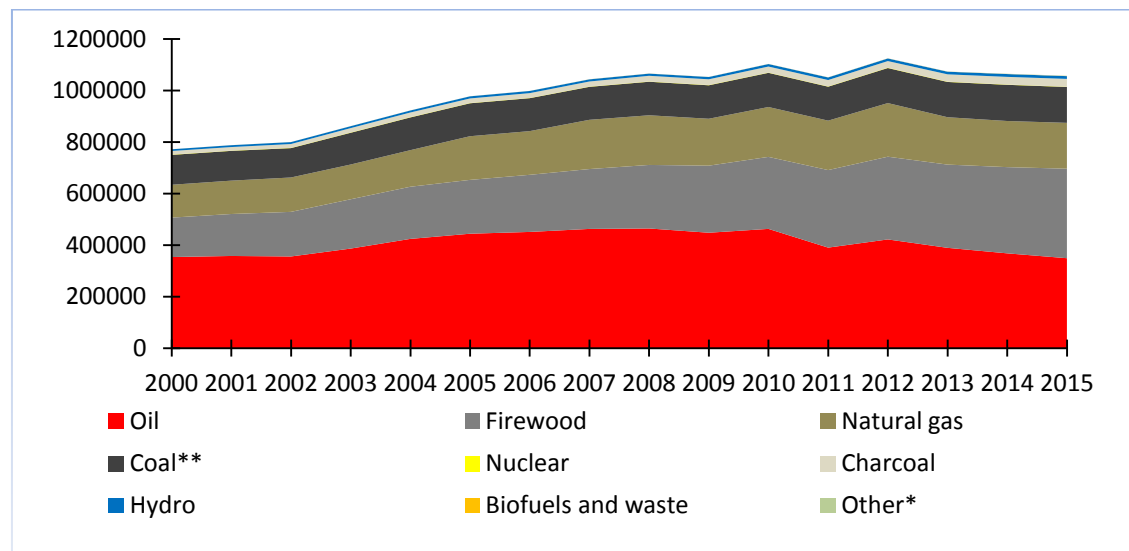
GLOSSARY

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TOTAL PRIMARY ENERGY SUPPLY BY FUEL

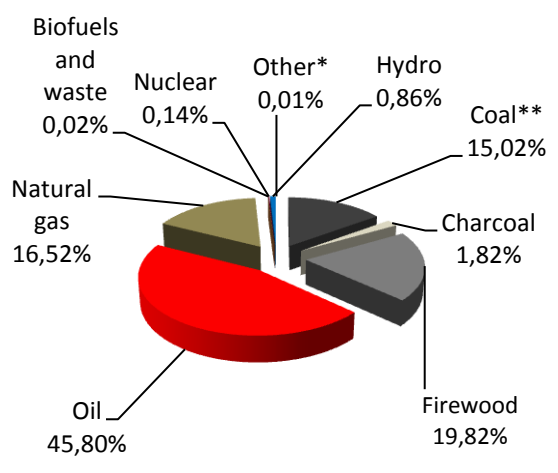
AFRICA

Africa Total Primary Energy Supply from 2 000 to 2 015 by fuel (ktoe)



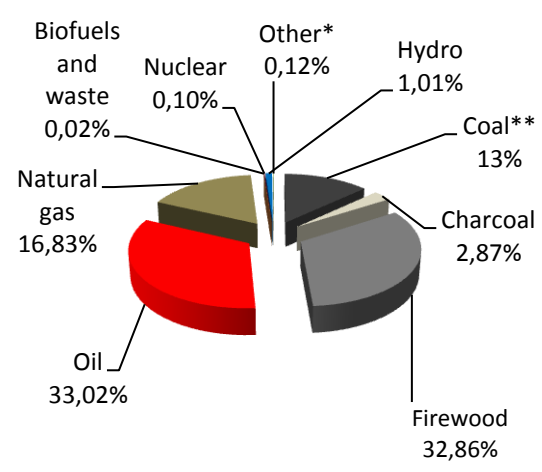
2 000 and 2 015 Fuel Shares of TPES

2 000



353 734 ktoe

2 015



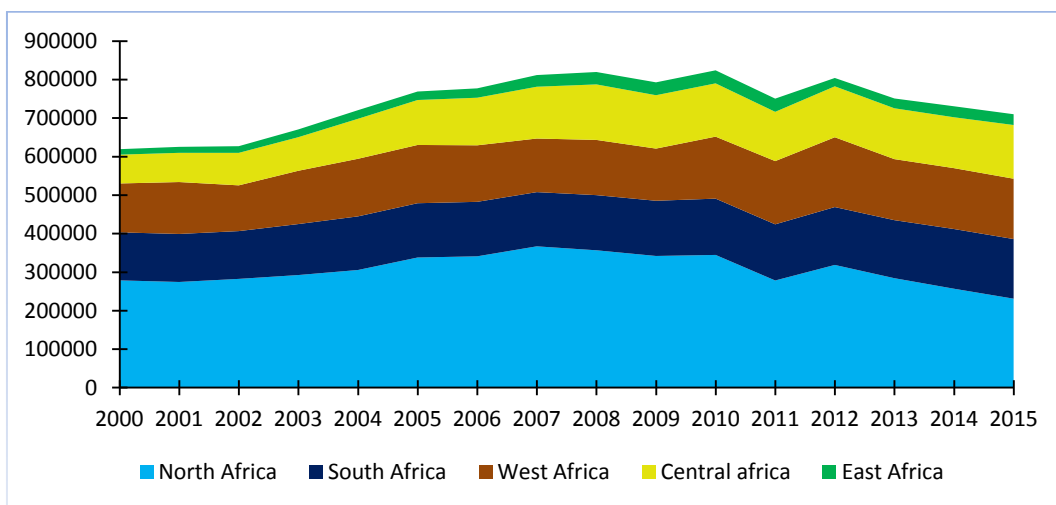
349 200 ktoe

* Other includes geothermal, solar, wind, wave, etc
 ** Includes steam coal, coking coal, lignite and recovered coal

TOTAL PRIMARY ENERGY SUPPLY BY REGION

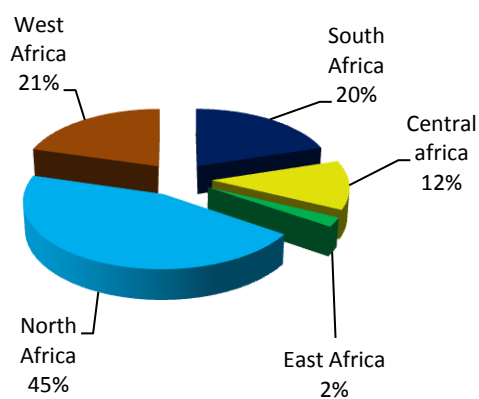
AFRICA

Africa Total Primary Energy Supply from 2 000 to 2 015
by region (ktoe)



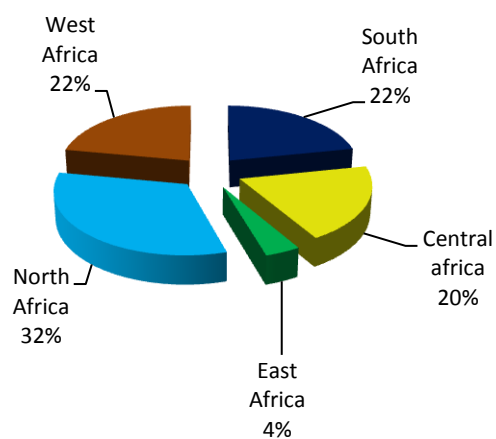
2 000 and 2 015 Regional Shares of TPES

2 000



278 643 ktoe

2 015

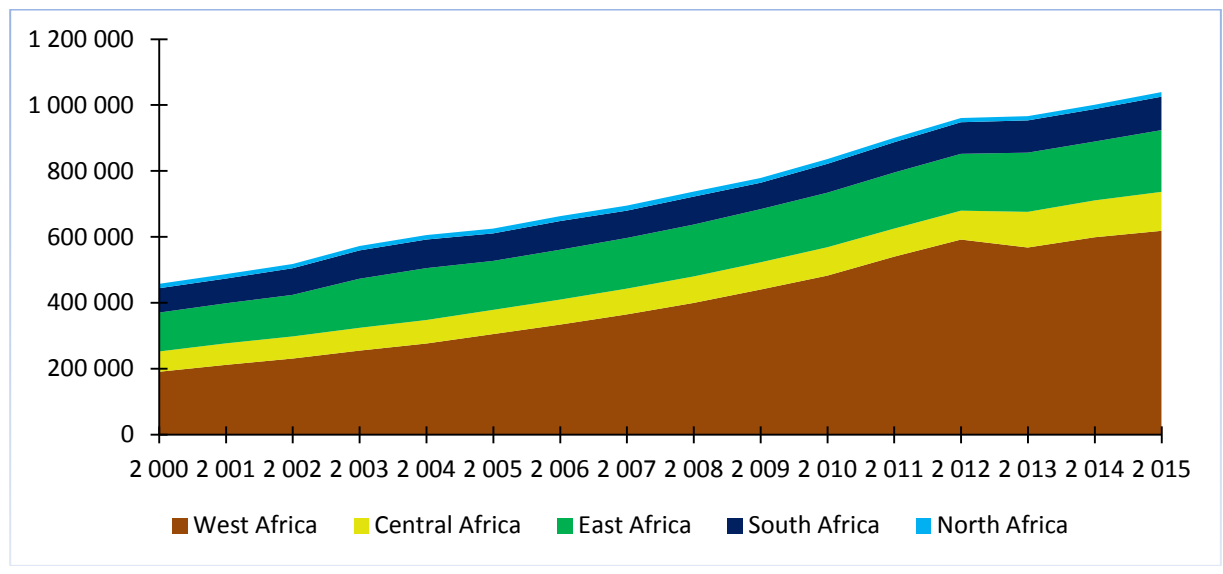


231 177 ktoe

FIREWOOD PRODUCTION

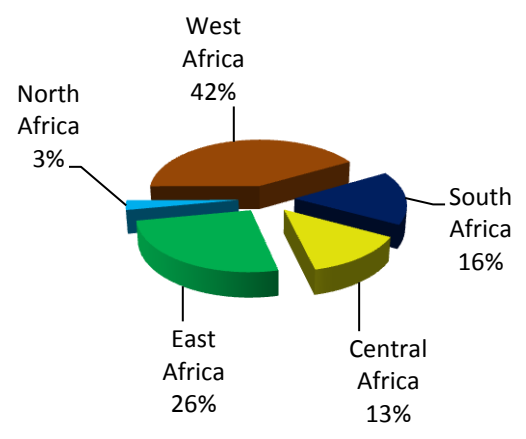
AFRICA

Firewood Production from 2 000 to 2 015
by region (kt)



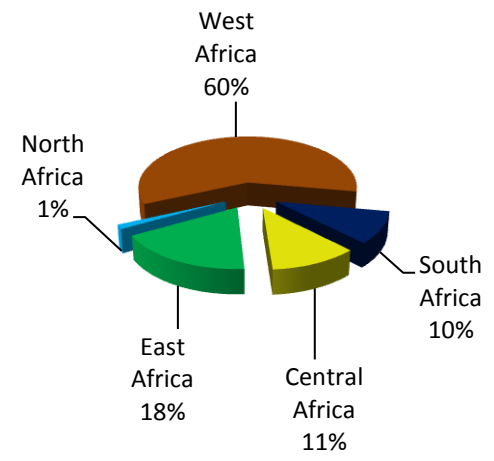
2 000 and 2 015 Regional Shares of Firewood Production

2 000



190 937 kt

2 015



618 498 kt

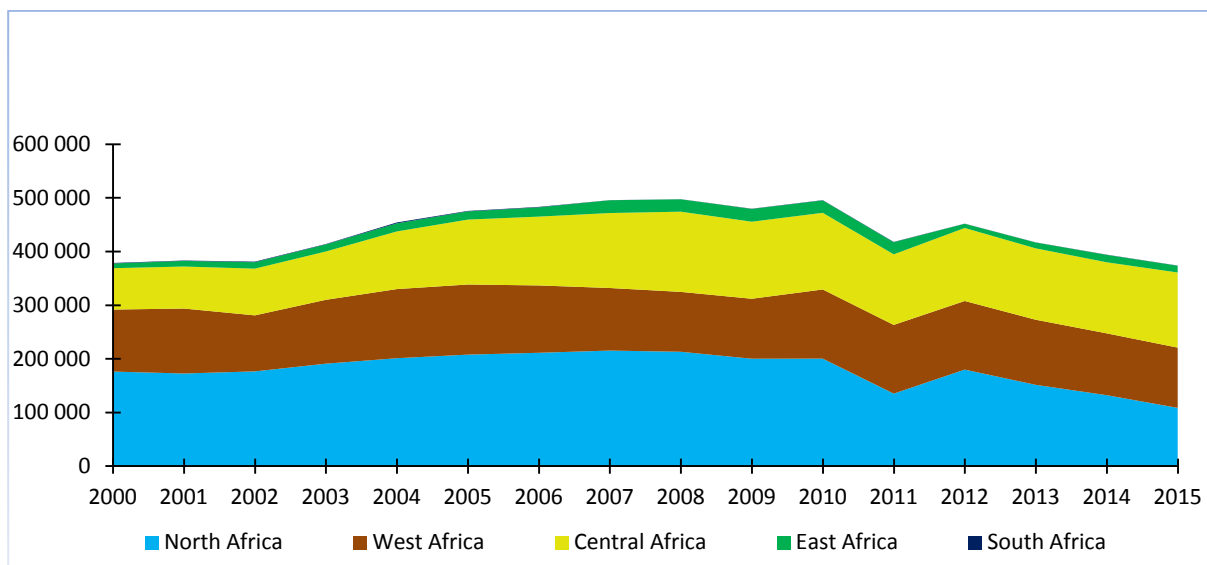
Producers of firewood from 2 015

| Producers | kt |
|---------------------|------------------|
| Nigeria | 512 801 |
| Ethiopia | 89 573 |
| Congo DR | 82 396 |
| Kenya | 33 284 |
| Uganda | 27 563 |
| Côte d'Ivoire | 21 662 |
| Mozambique | 19 710 |
| Zambia | 18 351 |
| South Africa | 16 641 |
| Zimbabwe | 16 544 |
| Madagascar | 16 495 |
| Sudan | 14 779 |
| Burkina Faso | 13 255 |
| Tanzania | 11 791 |
| Ghana | 10 893 |
| Egypt | 9 615 |
| Mali | 9 495 |
| Guinea | 9 081 |
| Chad | 8 362 |
| Togo | 8 339 |
| Somalia | 7 639 |
| Sierra Leone | 7 246 |
| Benin | 6 334 |
| Niger | 6 301 |
| Malawi | 6 140 |
| Burundi | 5 350 |
| Congo | 5 189 |
| Cameroon | 4 497 |
| Rwanda | 4 128 |
| Liberia | 4 023 |
| Angola | 3 909 |
| Senegal | 3 890 |
| Central Africa | 3 323 |
| Namibia | 2 963 |
| Tunisia | 2 817 |
| Mauritania | 2 365 |
| Lesotho | 2 304 |
| Guinea Bissau | 1 375 |
| Eritrea | 1 354 |
| Gambia | 1 329 |
| Swaziland | 1 230 |
| Other Africa | 5 077 |
| Africa | 1 039 415 |

CRUDE OIL PRODUCTION

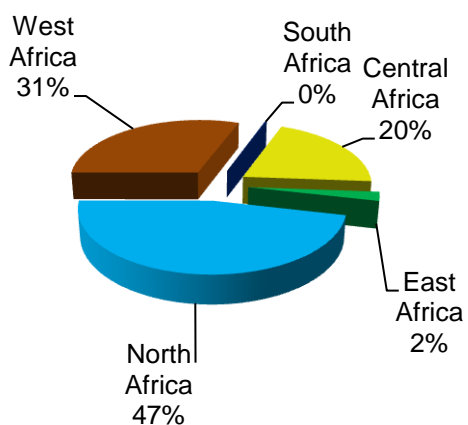
AFRICA

Crude Oil* Production from 2 000 to 2 015
by region (kt)



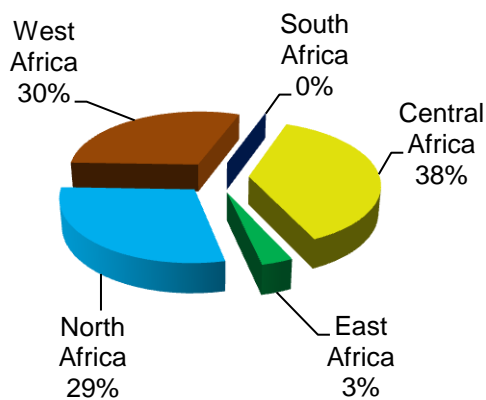
2 000 and 2 015 Regional Shares of Crude Oil* Production

2 000



176 369 kt

2 015



139 971 kt

* Include crude oil, NGL, additives and other hydrocarbons

Producers, Net Exporters and Net Importers of Crude Oil* from 2 015

| Producers | kt |
|-------------------|----------------|
| Nigeria | 104 303 |
| Angola | 89 454 |
| Algeria | 49 184 |
| Egypt. | 35 561 |
| Libya | 21 437 |
| Equatorial Guinea | 12 935 |
| Congo | 12 914 |
| Gabon | 11 503 |
| South Sudan | 7 388 |
| Chad | 7 185 |
| Ghana | 5 559 |
| Sudan | 5 250 |
| Cameroon | 4 851 |
| Tunisia | 2 551 |
| Côte d'Ivoire | 1 354 |
| Congo DR | 1 130 |
| Niger | 741 |
| South Africa | 310 |
| Mauritania | 306 |
| Morocco | 5 |
| Africa | 373 921 |

| Net exporters | kt |
|-------------------|----------------|
| Nigeria | 104 067 |
| Angola | 86 329 |
| Algeria | 24 181 |
| Libya | 15 845 |
| Equatorial Guinea | 12 652 |
| Congo | 12 086 |
| Gabon | 10 701 |
| Egypt | 9 161 |
| South Africa | 7 363 |
| Chad | 6 458 |
| Ghana | 4 898 |
| Cameroon | 3 058 |
| Congo DR | 1 048 |
| Tunisia | 993 |
| Sudan | 505 |
| Mauritania | 208 |
| Africa | 299 553 |

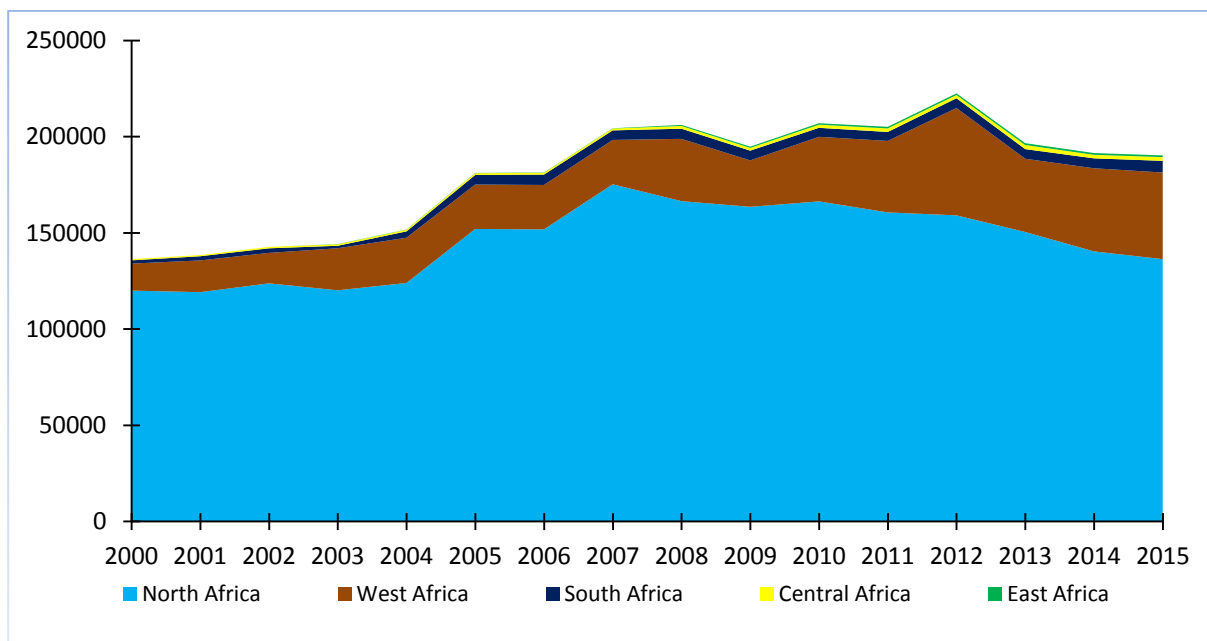
| Net Importers | kt |
|---------------|---------------|
| South Africa | 20 414 |
| Morocco | 2 690 |
| Côte d'Ivoire | 1 779 |
| Senegal | 894 |
| Zambia | 643 |
| Kenya | 631 |
| Africa | 27 050 |

* Include crude oil, NGL, additives and other hydrocarbons.

NATURAL GAS PRODUCTION

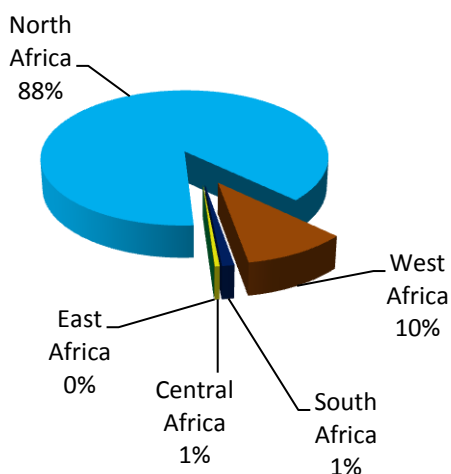
AFRICA

Natural gas production from 2 000 to 2 015
by region (Million cubic meters)



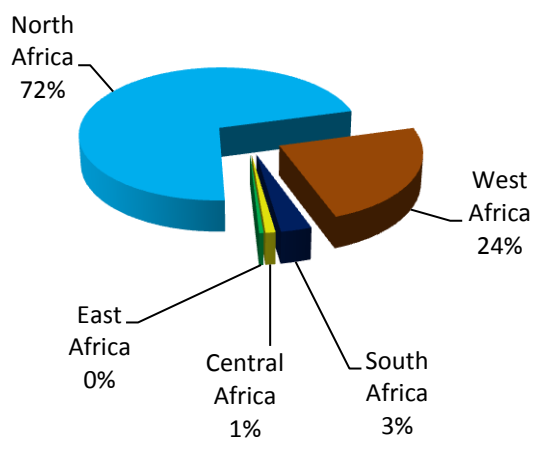
2 000 and 2 015 Regional Shares of Natural Gas Production

2 000



120 017 Mcm

2 015



136 375 Mcm

Producers, Net Exporters and Net Importers* Of Natural Gas from 2 015

| Producers | Mcm |
|-------------------|----------------|
| Algeria | 84 824 |
| Nigeria | 42 388 |
| Egypt | 37 158 |
| Libya | 11 254 |
| Mozambique | 4 859 |
| Tunisia | 3 061 |
| Côte d'Ivoire | 2 003 |
| South Africa | 1 217 |
| Tanzania | 868 |
| Angola | 747 |
| Ghana | 556 |
| Gabon | 364 |
| Cameroon | 351 |
| Equatorial Guinea | 253 |
| Congo | 240 |
| Morocco | 79 |
| Senegal | 49 |
| Africa | 190 270 |

| Net exporters | Mcm |
|-------------------|---------------|
| Algeria | 43946 |
| Nigeria | 24680 |
| Libya | 5102 |
| Mozambique | 3955 |
| Angola | 407 |
| Guinea Equatorial | 203 |
| Africa | 78 293 |

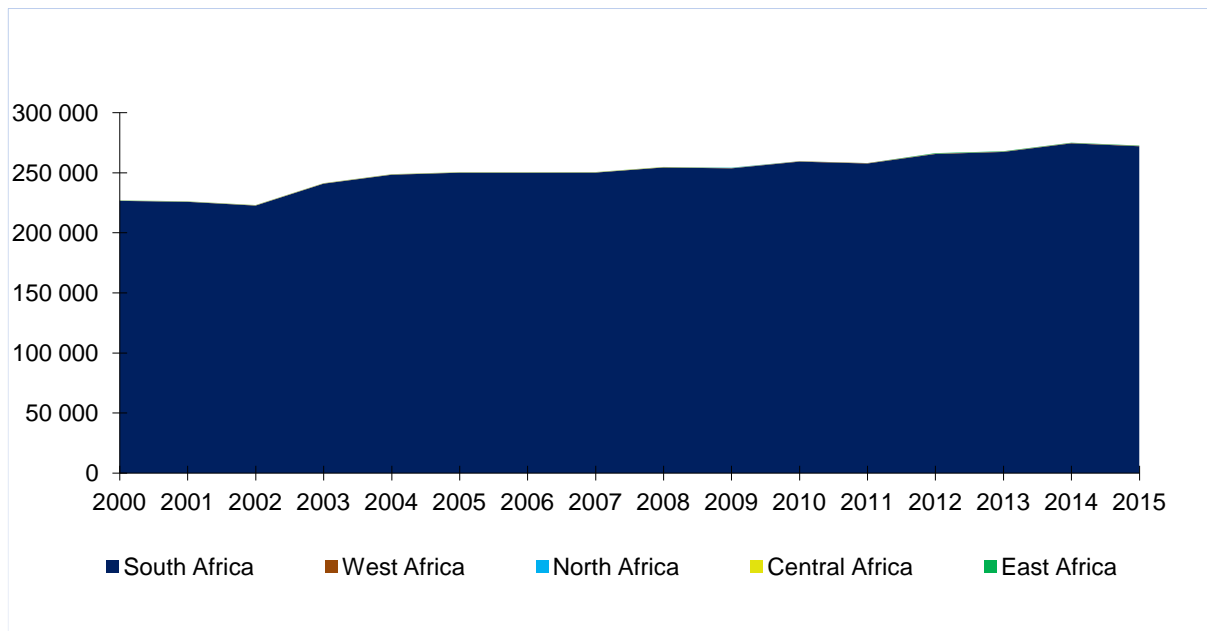
| Net importers | Mcm |
|---------------|---------------|
| Egypt | 6 514 |
| South Africa | 3 835 |
| Tunisia | 3 016 |
| Morocco | 1 127 |
| Ghana | 708 |
| Congo DR | 1 |
| Africa | 15 202 |

* Net exports and net imports include pipeline gas and LNG.

COAL* PRODUCTION

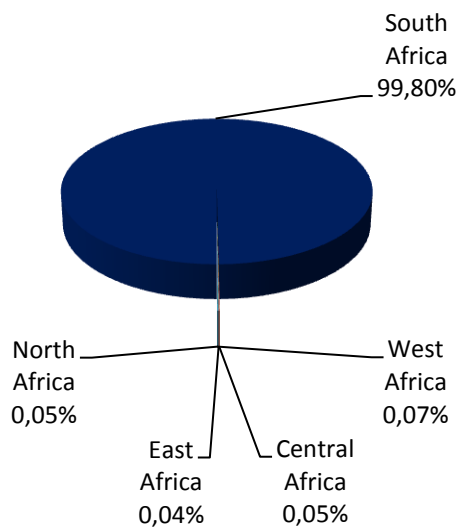
AFRICA

Coal* Production from 2 000 to 2 015
by region (kt)



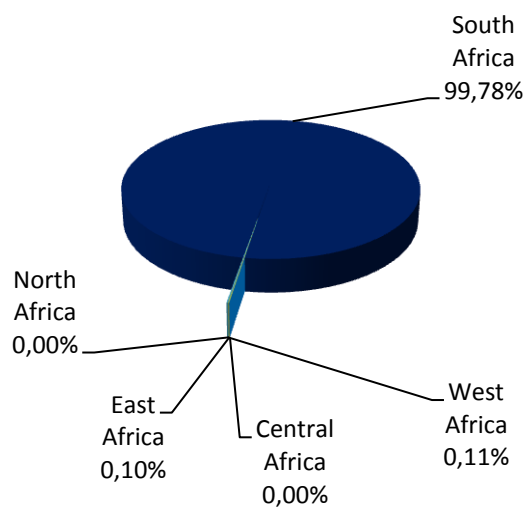
2 000 and 2 015 Regional Shares of Coal* Production

2 000



226 635 kt

2 015



272 096 kt

*Includes steam coal, coking coal, lignite and recovered coal

Producers, Net Exporters and Net Importers of Coal* from 2 015

| Producers | kt |
|---------------|----------------|
| South Africa | 258 550 |
| Mozambique | 6 600 |
| Zimbabwe | 4 336 |
| Botswana | 2 066 |
| Swaziland | 330 |
| Niger | 263 |
| Tanzania | 257 |
| Zambia | 159 |
| Malawi | 55 |
| Nigeria | 47 |
| Ethiopia | 23 |
| Africa | 272 686 |

| Net exporters | kt |
|---------------|---------------|
| South Africa | 74 710 |
| Mozambique | 4 809 |
| Swaziland | 365 |
| Africa | 79 884 |

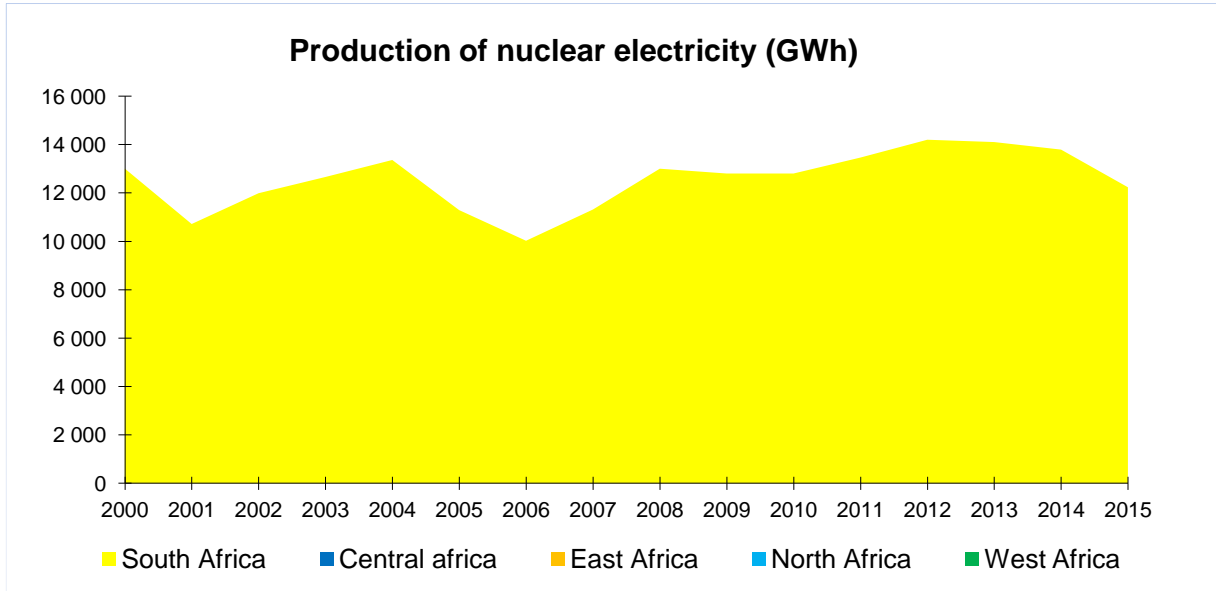
| Net importers | kt |
|---------------|--------------|
| Morocco | 6 460 |
| Mauritius | 804 |
| Kenya | 566 |
| Ethiopia | 411 |
| Senegal | 389 |
| Egypt | 341 |
| Algeria | 190 |
| Benin | 41 |
| Zimbabwe | 24 |
| Madagascar | 15 |
| Namibia | 4 |
| Botswana | 3 |
| Africa | 9 248 |

*Includes steam coal, coking coal, lignite and recovered coal

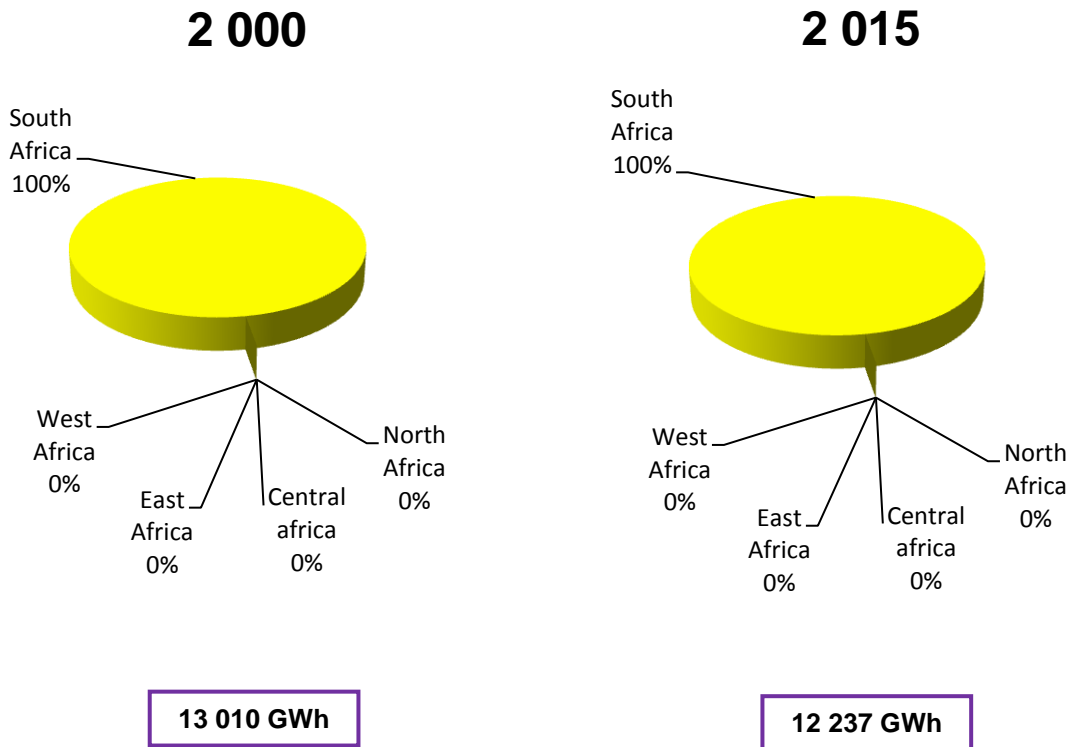
NUCLEAR PRODUCTION

AFRICA

Nuclear Production from 2 000 to 2 015
by region (GWh)



2 000 and 2 015 Regional Shares of Nuclear Production



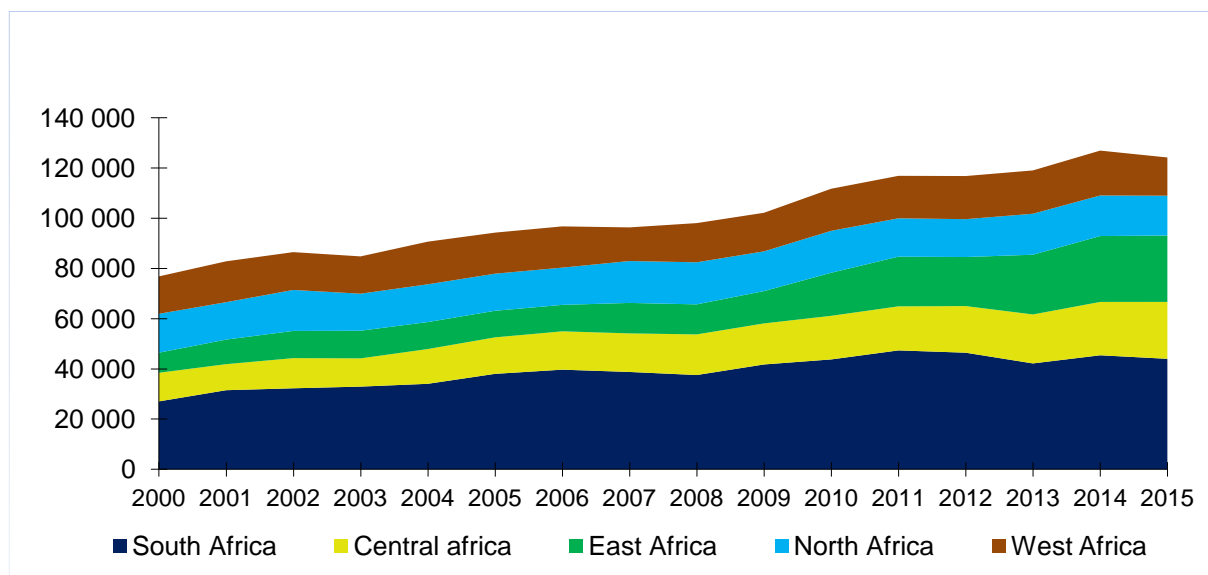
Producers of Nuclear Electricity from 2 015

| Producers | GWh |
|------------------|---------------|
| South Africa | 12 237 |
| Africa | 12 237 |

HYDRO PRODUCTION

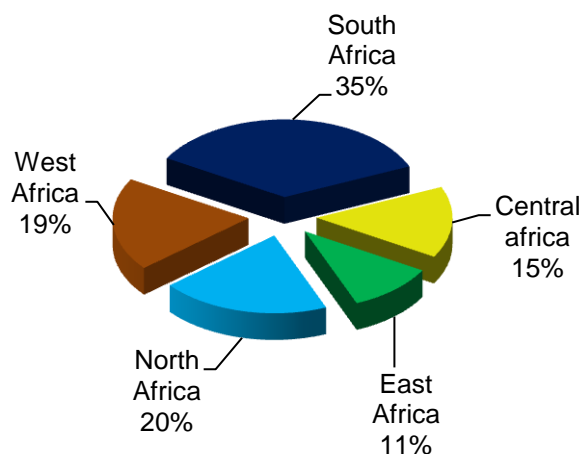
AFRICA

Hydro production from 2 000 to 2 015
by region (GWh)



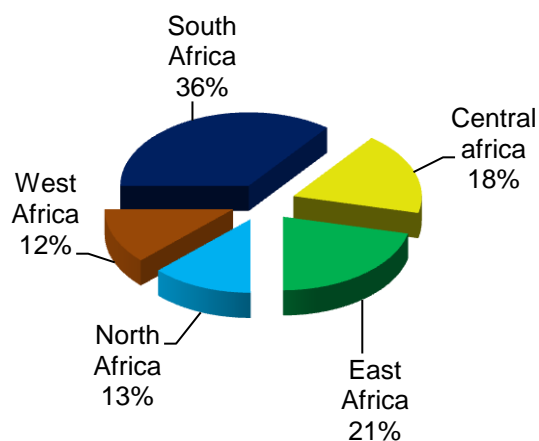
2 000 and 2 015 Regional Shares of Hydro Production

2 000



27 046 GWh

2 015



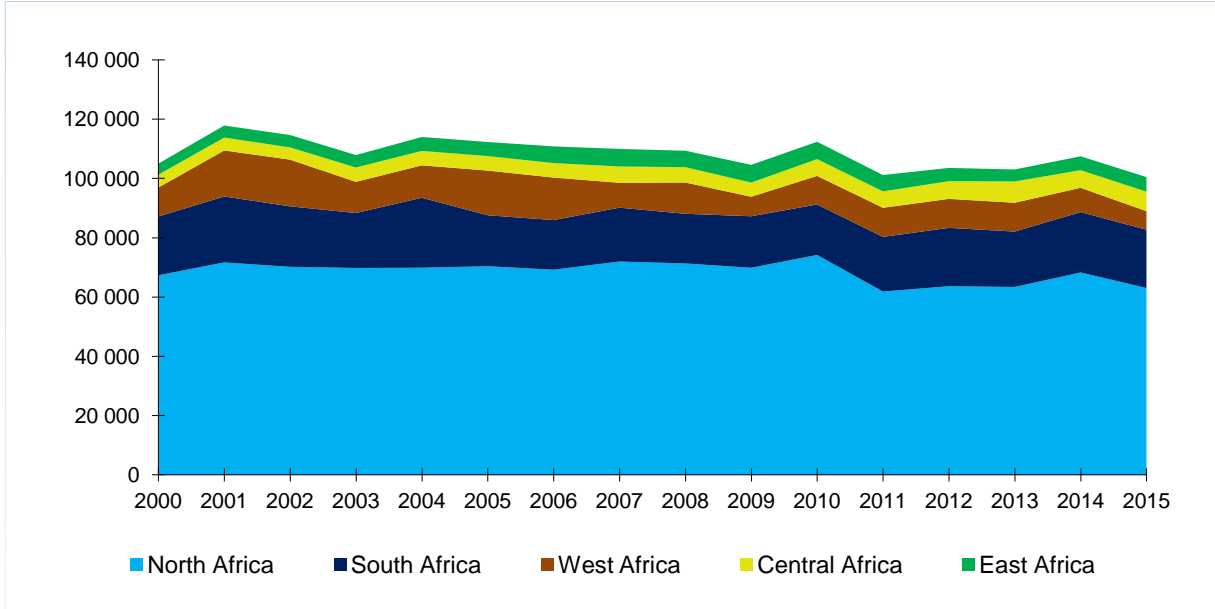
40 020 GWh

Producers of Hydro Electricity from 2 015

| Producers | GWh |
|---------------------|----------------|
| Mozambique | 16 398 |
| Egypt | 13 432 |
| Zambia | 13 035 |
| Ethiopia | 9 674 |
| Congo DR | 9 451 |
| Sudan | 8 420 |
| Ghana | 5 845 |
| Nigeria | 5 718 |
| Angola | 5 192 |
| Cameroon | 5 068 |
| Zimbabwe | 4 990 |
| Kenya | 3 787 |
| South Africa | 3 720 |
| Malawi | 2 659 |
| Uganda | 2 433 |
| Morocco | 2 281 |
| Tanzania | 2 108 |
| Namibia | 1 502 |
| Côte d'Ivoire | 1 352 |
| Madagascar | 971 |
| Congo | 925 |
| Gabon | 918 |
| Mali | 744 |
| Guinea | 688 |
| Equatorial Guinea | 567 |
| Lesotho | 402 |
| Senegal | 342 |
| Rwanda | 217 |
| Swaziland | 216 |
| Sierra Leone | 189 |
| Mauritania | 184 |
| Burundi | 181 |
| Central Africa | 141 |
| Mauritius | 122 |
| Burkina Faso | 93 |
| Algeria | 72 |
| Tunisia | 61 |
| Togo | 56 |
| South Sudan | 22 |
| Benin | 14 |
| Somalia | 11 |
| São Tomé & Príncipe | 11 |
| Comoros | 5 |
| Africa | 124 217 |

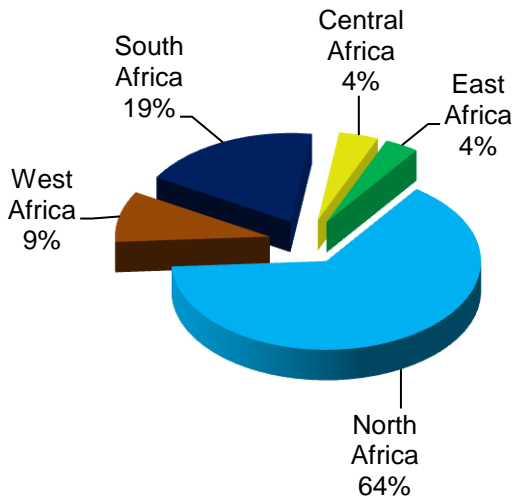
REFINING BY REGION

AFRICA
Refinery Production from 2 000 to 2 015
by region (kt)



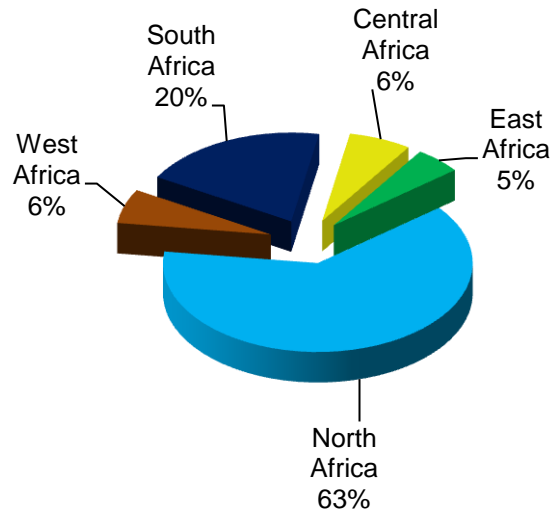
2 000 and 2 015 Regional Shares of Refinery Production

2 000



67 350 kt

2 015



63 045 kt

Producers, Net Exporters and Net Importers of Oil Products in 2 015

| Producers | kt |
|---------------|----------------|
| Algeria | 28 789 |
| Egypt | 25 595 |
| South Africa | 19 039 |
| Sudan | 4 261 |
| Libya | 4 239 |
| Côte d'Ivoire | 3 228 |
| Morocco | 3 126 |
| Angola | 2 571 |
| Cameroon | 1 789 |
| Nigeria | 1 607 |
| Tunisia | 1 305 |
| Gabon | 801 |
| Congo | 754 |
| Senegal | 698 |
| Niger | 664 |
| Kenya | 655 |
| Chad | 652 |
| Zambia | 605 |
| Ghana | 89 |
| Africa | 100 467 |

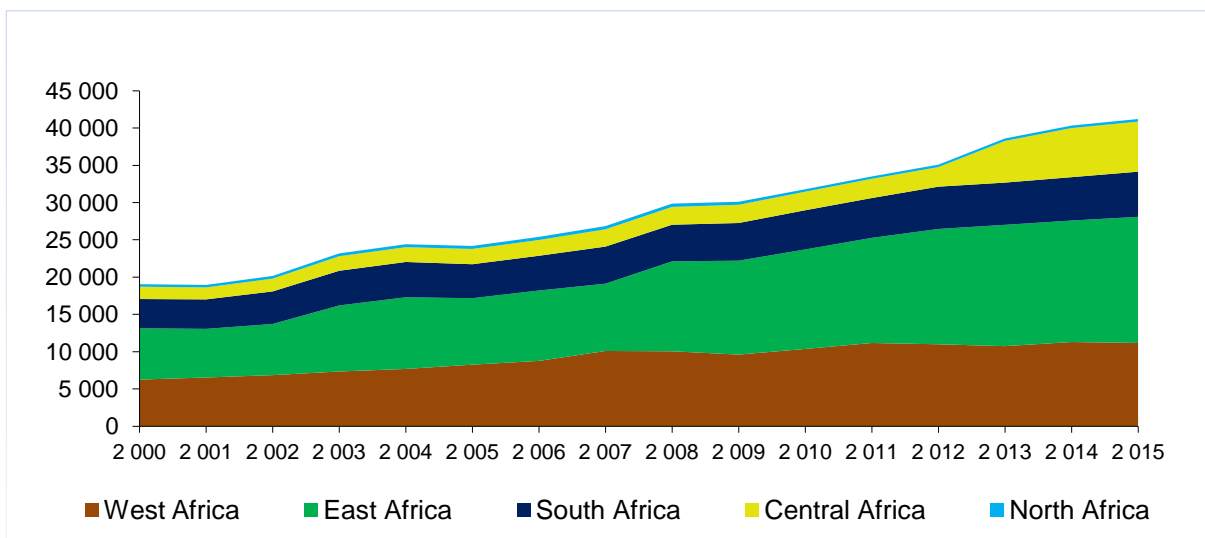
| Net exporters | kt |
|---------------|---------------|
| Algeria | 12716 |
| Côte d'Ivoire | 1242 |
| Niger | 74 |
| Chad | 5 |
| Africa | 14 037 |

| Net importers | kt |
|---------------------|---------------|
| Egypt | 13 569 |
| Morocco | 9 973 |
| Nigeria | 9 682 |
| Libya | 6 594 |
| South Africa | 6 550 |
| Kenya | 4 178 |
| Angola | 3 885 |
| Ghana | 3 753 |
| Tunisia | 3 488 |
| Ethiopia | 3 393 |
| Uganda | 3 203 |
| Tanzania | 3 196 |
| Benin | 1 661 |
| Mali | 1 368 |
| Senegal | 1 336 |
| Mauritius | 1 292 |
| Namibia | 1 228 |
| Zimbabwe | 1 222 |
| Mozambique | 1 171 |
| Burkina Faso | 1 043 |
| Congo DR | 985 |
| Botswana | 967 |
| Guinea | 924 |
| Mauritania | 811 |
| Madagascar | 773 |
| Sudan | 708 |
| Togo | 616 |
| Djibouti | 487 |
| Zambia | 450 |
| Malawi | 402 |
| Sierra Leone | 347 |
| South Sudan | 343 |
| Seychelles | 331 |
| Swaziland | 301 |
| Equatorial Guinea | 287 |
| Gabon | 254 |
| Rwanda | 230 |
| Cameroon | 225 |
| Gambia | 218 |
| Cape Verde | 197 |
| Eritrea | 196 |
| Liberia | 190 |
| Lesotho | 178 |
| Somalia | 133 |
| Saharawi Republic | 85 |
| Burundi | 78 |
| Central Africa | 56 |
| São Tomé & Príncipe | 55 |
| Guinea Bissau | 51 |
| Comoros | 37 |
| Congo | 22 |
| Africa | 92 720 |

CHARCOAL PRODUCTION

AFRICA

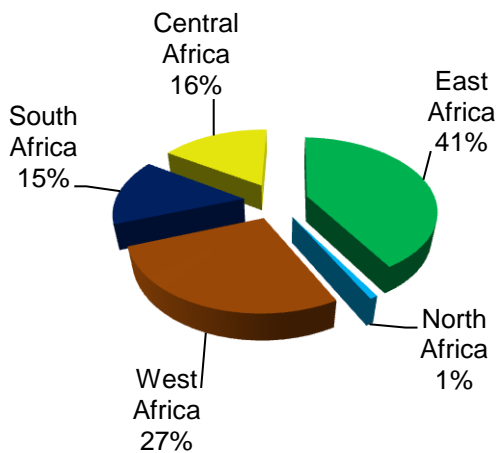
Charcoal production from 2 000 to 2 015
by region (kt)



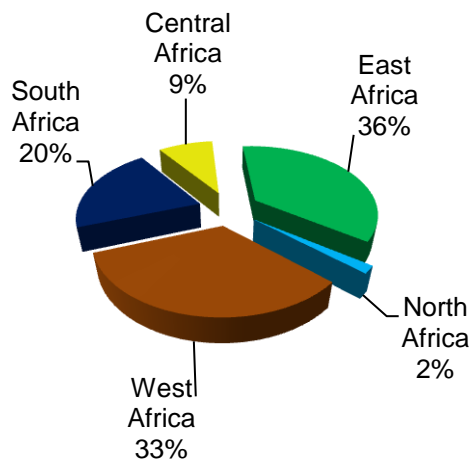
2 000 and 2 015 Regional Shares of Charcoal Production

2 015

2 000



6 889 kt



16 912 kt

Producers of Charcoal from 2 015

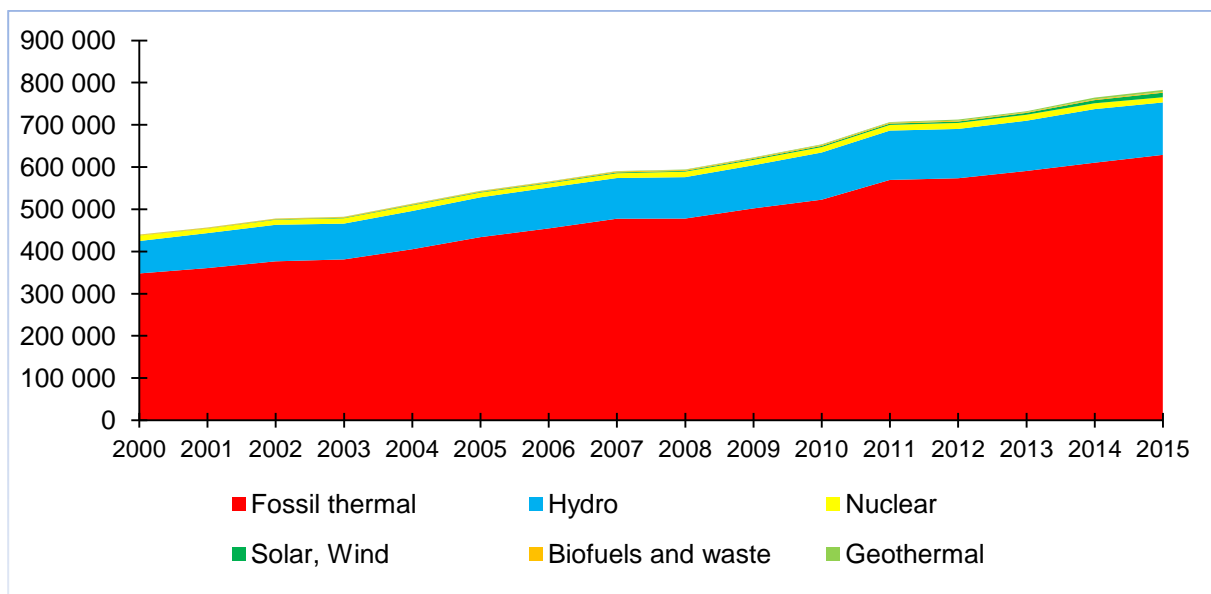
| Producers | kt |
|---------------|-------|
| Ethiopia | 6 181 |
| Nigeria | 3 945 |
| Congo DR | 3 841 |
| Kenya | 3 670 |
| Tanzania | 1 999 |
| Uganda | 1 978 |
| South Africa | 1 833 |
| Sudan | 1 629 |
| Côte d'Ivoire | 1 452 |
| Madagascar | 1 375 |
| Somalia | 1 245 |
| Angola | 1 186 |
| Ghana | 1 152 |
| Zambia | 1 094 |
| Mozambique | 748 |
| Togo | 688 |
| Malawi | 564 |
| Benin | 535 |
| Senegal | 518 |
| Mali | 513 |
| Cameroon | 497 |
| Burkina Faso | 490 |
| Chad | 462 |
| Niger | 462 |
| Sierra Leone | 426 |
| Guinea | 384 |
| Burundi | 287 |
| Liberia | 269 |
| Congo | 210 |
| Tunisia | 207 |
| Mauritania | 206 |
| Rwanda | 175 |
| Eritrea | 149 |
| Namibia | 147 |
| Libya | 118 |
| Lesotho | 113 |
| Botswana | 78 |
| Guinea Bissau | 73 |
| Gambia | 66 |
| Djibouti | 53 |
| Swaziland | 49 |
| Comoros | 44 |
| Gabon | 22 |

| | |
|---------------------|---------------|
| Morocco | 18 |
| Central Africa | 14 |
| Equatorial Guinea | 11 |
| São Tomé & Príncipe | 10 |
| Zimbabwe | 9 |
| South Sudan | 7 |
| Algeria | 2 |
| Mauritius | 1 |
| Cape Verde | 1 |
| Africa | 41 208 |

ELECTRICITY GENERATION BY FUEL

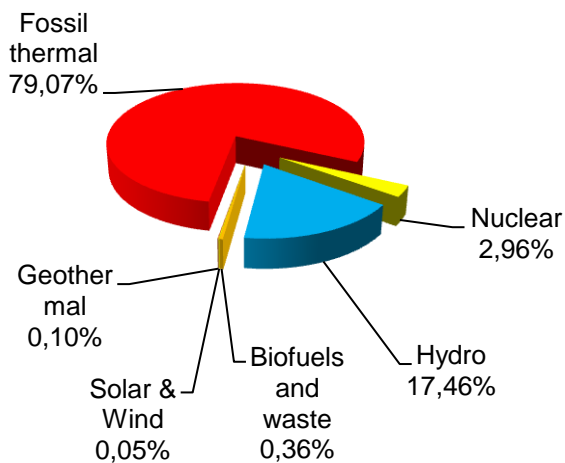
AFRICA

Electricity Generation from 2 000 to 2 015
by fuel (GWh)



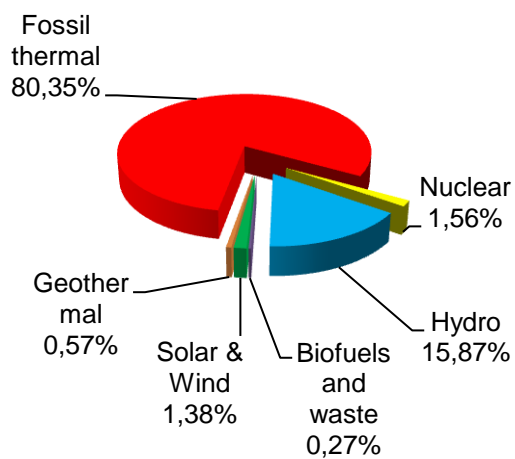
2 000 and 2 015 Fuel Shares of Electricity Generation

2 000



347 982 GWh

2 015



628 991 GWh

Electricity Production by Fuel from 2 015

| Nuclear | GWh |
|---------------|---------------|
| South Africa | 12 237 |
| Africa | 12 237 |

| Solar, wind, Geothermal, Biofuels and waste | GWh |
|---|---------------|
| South Africa | 4 764 |
| Kenya | 4 659 |
| Morocco | 2 522 |
| Egypt | 1 598 |
| Ethiopia | 759 |
| Mauritius | 560 |
| Tunisia | 506 |
| Swaziland | 347 |
| Algeria | 298 |
| Côte d'Ivoire | 223 |
| Sudan | 220 |
| Uganda | 215 |
| Cameroon | 147 |
| Zimbabwe | 134 |
| Senegal | 93 |
| Nigeria | 78 |
| Mali | 62 |
| Tanzania | 39 |
| Cape Verde | 37 |
| Togo | 28 |
| Mauritania | 26 |
| Madagascar | 26 |
| Namibia | 19 |
| Seychelles | 18 |
| Congo DR | 17 |
| Gabon | 16 |
| Botswana | 15 |
| Malawi | 14 |
| Sierra Leone | 11 |
| Other Africa | 79 |
| Africa | 17 532 |

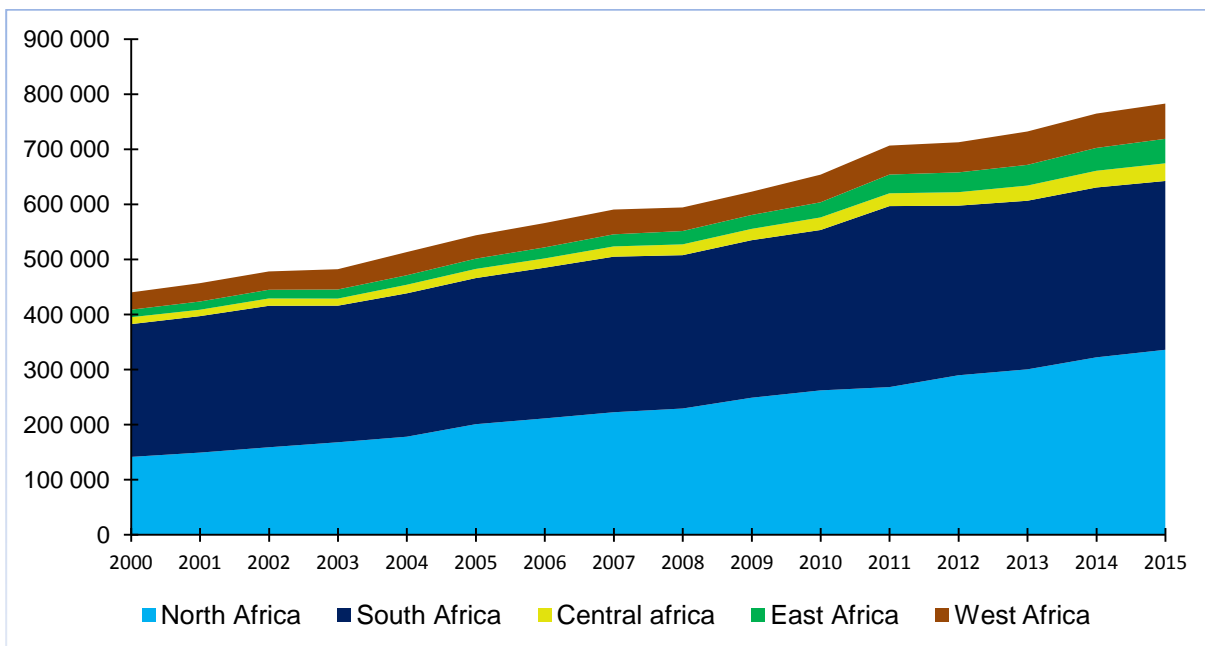
| Hydro | GWh |
|---------------------|----------------|
| Mozambique | 16 398 |
| Egypt | 13 432 |
| Zambia | 13 035 |
| Ethiopia | 9 674 |
| Congo DR | 9 451 |
| Sudan | 8 420 |
| Ghana | 5 845 |
| Nigeria | 5 718 |
| Angola | 5 192 |
| Cameroon | 5 068 |
| Zimbabwe | 4 990 |
| Kenya | 3 787 |
| South Africa | 3 720 |
| Malawi | 2 659 |
| Uganda | 2 433 |
| Morocco | 2 281 |
| Tanzania | 2 108 |
| Namibia | 1 502 |
| Côte d'Ivoire | 1 352 |
| Madagascar | 971 |
| Congo | 925 |
| Gabon | 918 |
| Mali | 744 |
| Guinea | 688 |
| Equatorial Guinea | 567 |
| Lesotho | 402 |
| Senegal | 342 |
| Rwanda | 217 |
| Swaziland | 216 |
| Sierra Leone | 189 |
| Mauritania | 184 |
| Burundi | 181 |
| Central Africa | 141 |
| Mauritius | 122 |
| Burkina Faso | 93 |
| Algeria | 72 |
| Tunisia | 61 |
| Togo | 56 |
| South Sudan | 22 |
| Benin | 14 |
| Somalia | 11 |
| São Tomé & Príncipe | 11 |
| Comoros | 5 |
| Africa | 124 217 |

| Fossil fuel | GWh |
|---------------------|----------------|
| South Africa | 228 935 |
| Egypt | 166 947 |
| Algeria | 66 553 |
| Libya | 37 713 |
| Nigeria | 25 708 |
| Morocco | 25 108 |
| Tunisia | 18 719 |
| Côte d'Ivoire | 7 254 |
| Ghana | 5 643 |
| Sudan | 4 627 |
| Zimbabwe | 4 590 |
| Angola | 4 498 |
| Tanzania | 4 145 |
| Senegal | 3 472 |
| Botswana | 2 966 |
| Mozambique | 2 706 |
| Mauritius | 2 316 |
| Burkina Faso | 1 710 |
| Madagascar | 1 678 |
| Cameroon | 1 614 |
| Mali | 1 425 |
| Kenya | 1 205 |
| Gabon | 1 196 |
| Congo | 806 |
| Uganda | 635 |
| Guinea | 544 |
| Niger | 527 |
| Mauritania | 498 |
| Seychelles | 423 |
| Zambia | 404 |
| Eritrea | 404 |
| Equatorial Guinea | 403 |
| Somalia | 383 |
| Djibouti | 361 |
| South Sudan | 328 |
| Benin | 323 |
| Swaziland | 322 |
| Cape Verde | 322 |
| Rwanda | 311 |
| Gambia | 310 |
| Chad | 290 |
| Sierra Leone | 152 |
| Guinea Bissau | 144 |
| Liberia | 108 |
| Saharawi Republic | 98 |
| Comoros | 62 |
| Namibia | 34 |
| Togo | 20 |
| São Tomé & Príncipe | 18 |
| Congo DR | 16 |
| Malawi | 8 |
| Burundi | 4 |
| Ethiopia | 4 |
| Africa | 628 991 |

ELECTRICITY GENERATION BY REGION

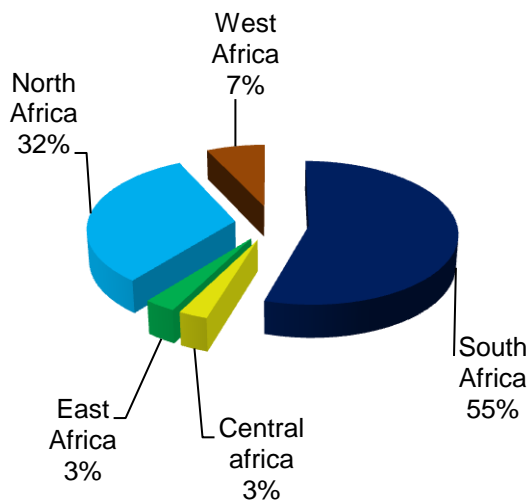
AFRICA

Electricity Generation from 2 000 to 2 015
by region (GWh)



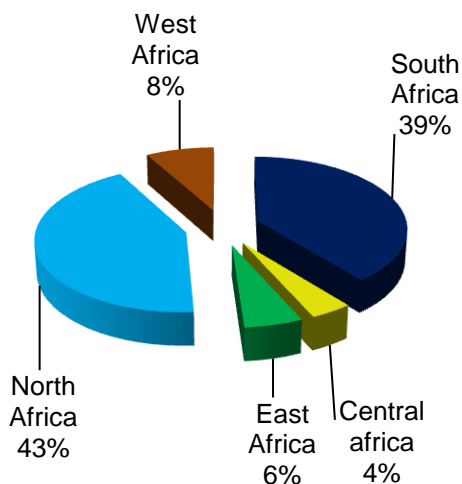
2 000 and 2 015 Regional Shares of Electricity Generation

2 000



241 026 GWh

2 015



335 917 GWh

Producers, Net Exporters and Net Imports of Electricity from 2 015

| Producers | GWh |
|---------------------|----------------|
| South Africa | 249 656 |
| Egypt | 181 977 |
| Algeria | 66 923 |
| Libya | 37 722 |
| Nigeria | 31 504 |
| Morocco | 29 911 |
| Tunisia | 19 286 |
| Mozambique | 19 105 |
| Zambia | 13 442 |
| Sudan | 13 267 |
| Ghana | 11 491 |
| Ethiopia | 10 437 |
| Angola | 9 695 |
| Kenya | 9 651 |
| Zimbabwe | 9 585 |
| Congo DR | 9 485 |
| Côte d'Ivoire | 8 829 |
| Cameroon | 6 829 |
| Tanzania | 6 292 |
| Senegal | 3 907 |
| Uganda | 3 283 |
| Mauritius | 2 998 |
| Botswana | 2 981 |
| Malawi | 2 681 |
| Madagascar | 2 675 |
| Mali | 2 230 |
| Gabon | 2 130 |
| Burkina Faso | 1 804 |
| Congo | 1 731 |
| Namibia | 1 555 |
| Guinea | 1 240 |
| Equatorial Guinea | 970 |
| Swaziland | 886 |
| Mauritania | 709 |
| Rwanda | 533 |
| Niger | 531 |
| Seychelles | 441 |
| Eritrea | 413 |
| Lesotho | 402 |
| Somalia | 394 |
| Djibouti | 364 |
| Cape Verde | 360 |
| South Sudan | 352 |
| Sierra Leone | 352 |
| Benin | 345 |
| Gambia | 316 |
| Chad | 290 |
| Burundi | 186 |
| Central Africa | 148 |
| Guinea Bissau | 147 |
| Liberia | 109 |
| Togo | 104 |
| Saharawi Republic | 98 |
| Comoros | 68 |
| São Tomé & Príncipe | 30 |
| Africa | 782 849 |

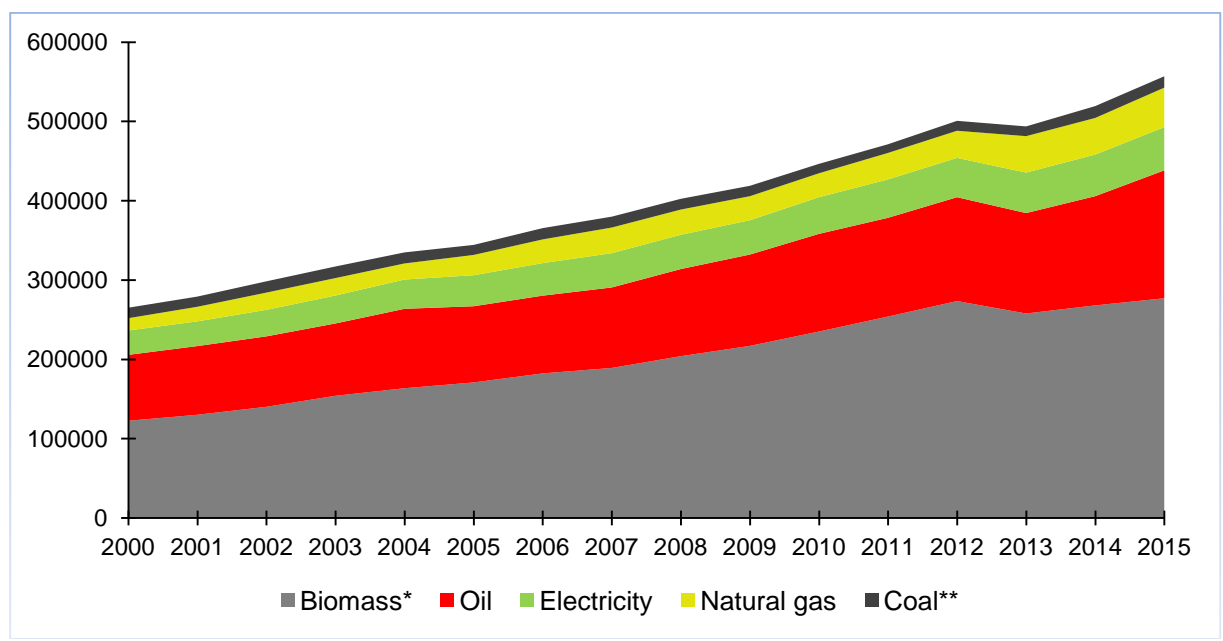
| Net importers | GWh |
|---------------|---------------|
| Morocco | 4 973 |
| Namibia | 2 535 |
| Botswana | 1 468 |
| Cameroon | 1 414 |
| Togo | 1 242 |
| Benin | 1 078 |
| Niger | 782 |
| Mali | 605 |
| Swaziland | 512 |
| Burkina Faso | 413 |
| Gabon | 337 |
| Senegal | 290 |
| Lesotho | 245 |
| Burundi | 98 |
| Rwanda | 90 |
| Libya | 88 |
| Tanzania | 71 |
| Kenya | 22 |
| Africa | 16 263 |

| Net exporters | GWh |
|---------------|--------------|
| Mozambique | 2 329 |
| South Africa | 1 550 |
| Egypt | 1 115 |
| Côte d'Ivoire | 849 |
| Congo DR | 402 |
| Zambia | 391 |
| Ghana | 329 |
| Ethiopia | 166 |
| Zimbabwe | 102 |
| Uganda | 100 |
| Tunisia | 97 |
| Algeria | 31 |
| Congo | 4 |
| Africa | 7 465 |

TOTAL FINAL CONSUMPTION BY FUEL

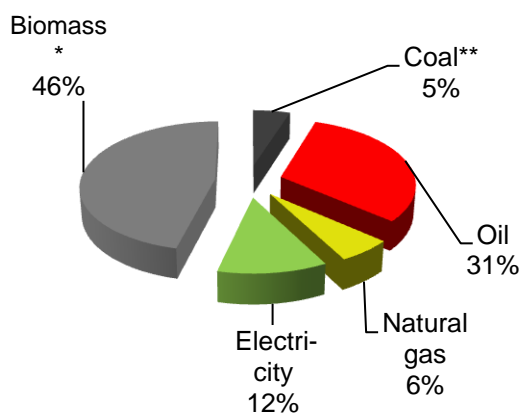
AFRICA

Total final consumption from 2 000 to 2 015
by fuel (ktoe)



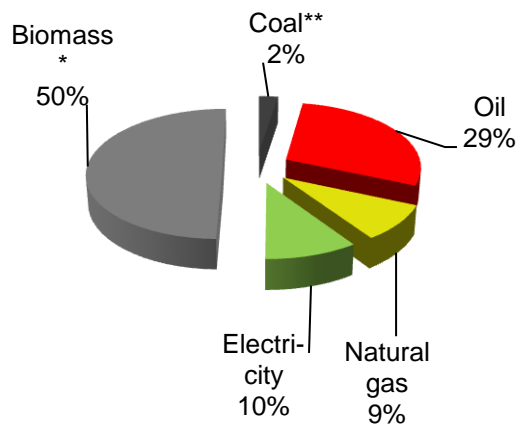
2 000 and 2 015 Fuel Shares of Total Final Consumption

2 000



122 625 ktoe

2 015



277 094 ktoe

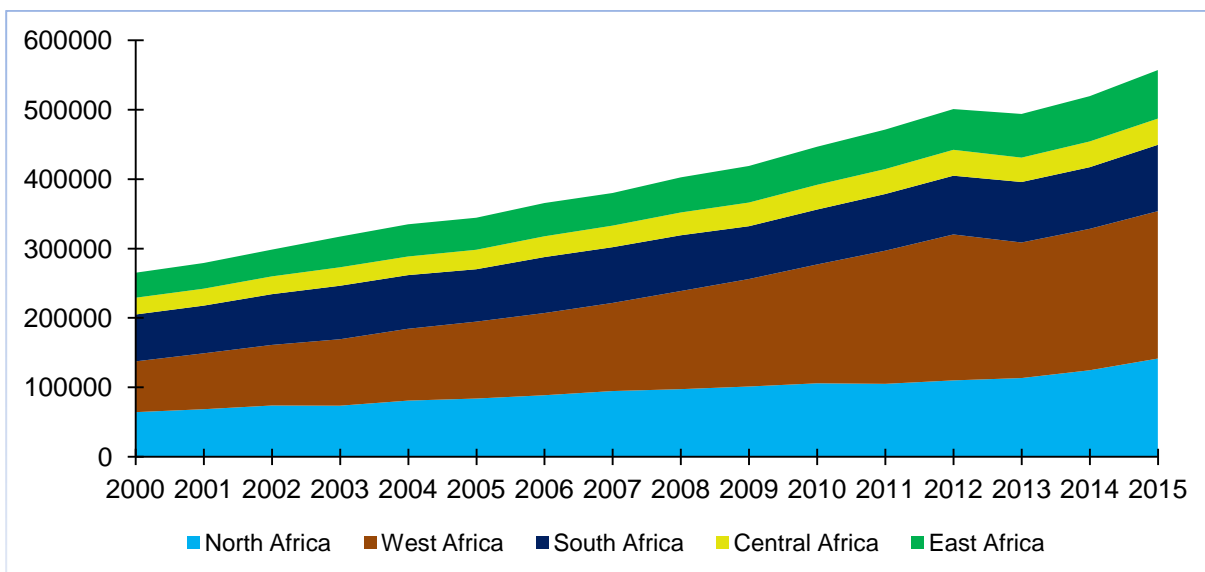
* includes firewood and charcoal

**Includes steam coal, coking coal, lignite and recovered coal

TOTAL FINAL CONSUMPTION BY REGION

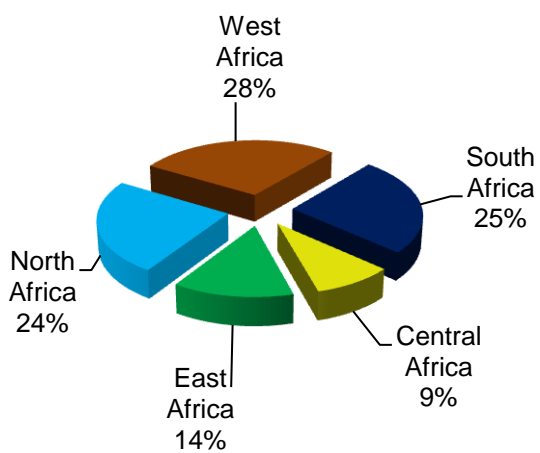
AFRICA

Total final consumption from 2 000 to 2 015
by region (ktoe)



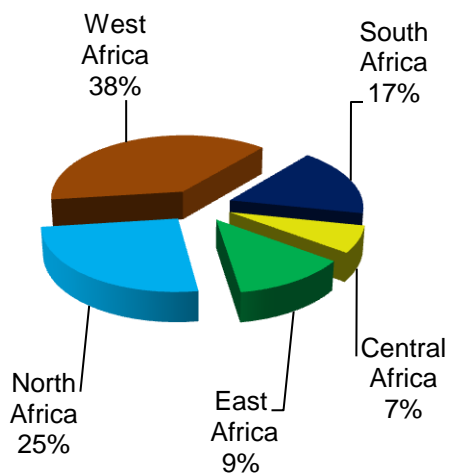
2 000 and 2 015 Regional Shares of Total Final Consumption

2 000



73 123 ktoe

2 015

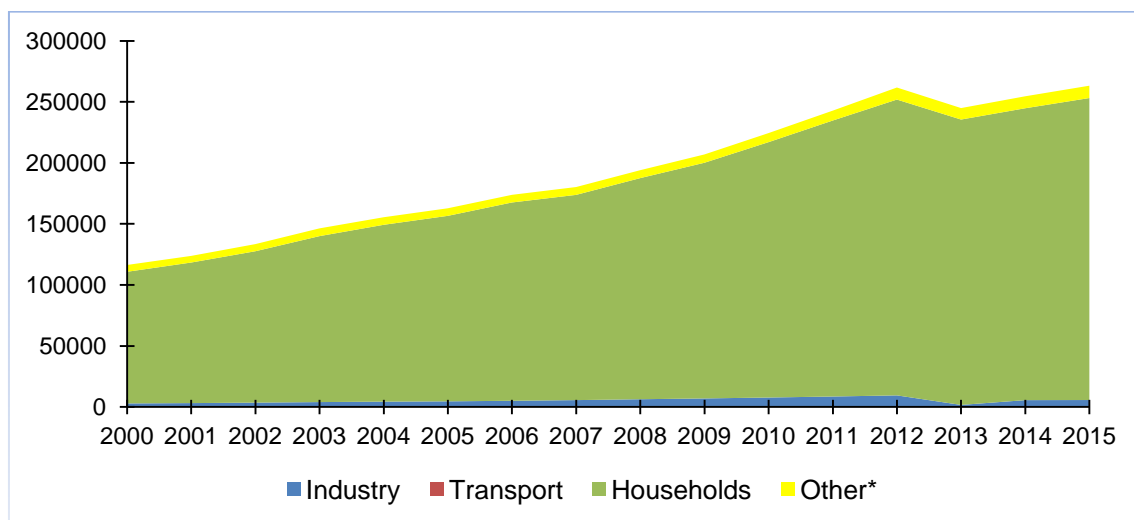


244 367 ktoe

TOTAL FINAL CONSUMPTION BY SECTOR

Firewood

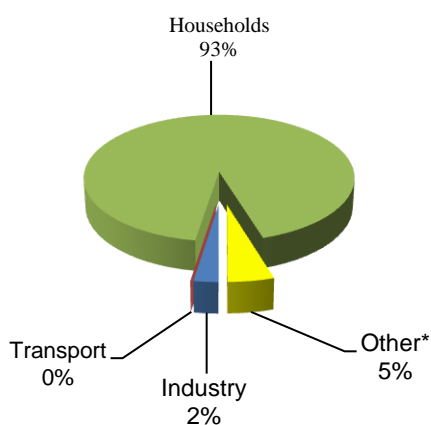
Total Final Consumption from 2 000 to 2 015
by sector (ktoe)



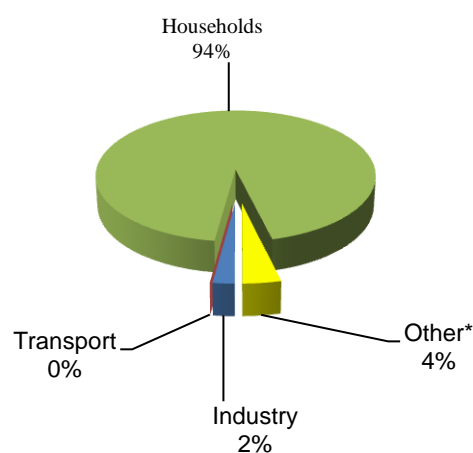
2 000 and 2 015 shares of Africa firewood consumption

2 000

2 015



107 822 ktoe

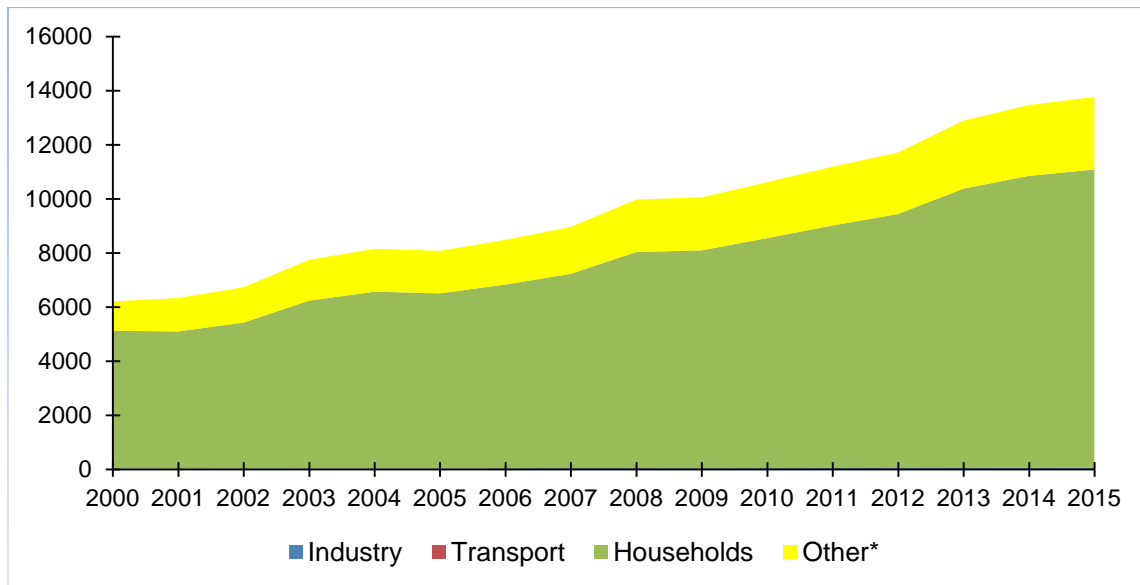


247 491 ktoe

* Includes agriculture, commercial, public service, and non-specified other

Charcoal

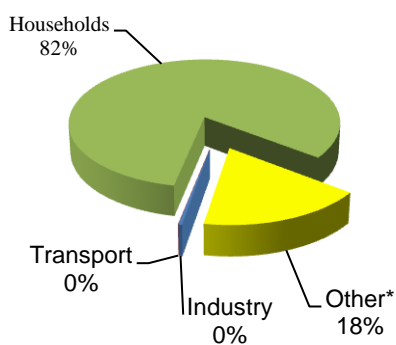
**Total Final Consumption from 2 000 to 2 015
by sector (ktoe)**



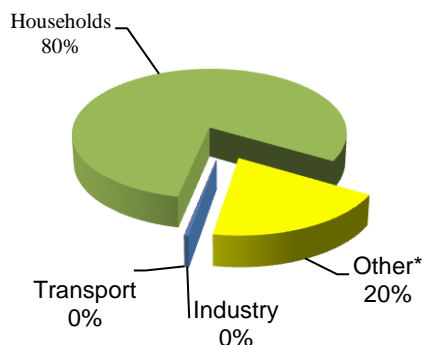
2 000 and 2 015 shares of Africa charcoal consumption

2 000

2 015



5 099 ktoe

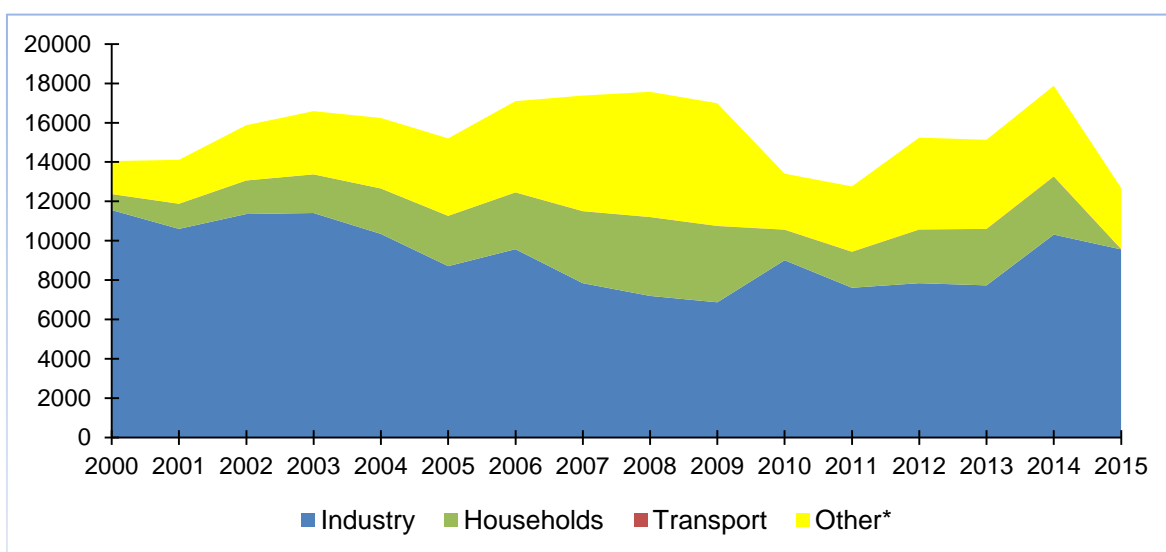


11 023 ktoe

* Includes agriculture, commercial, public service, and non-specified other

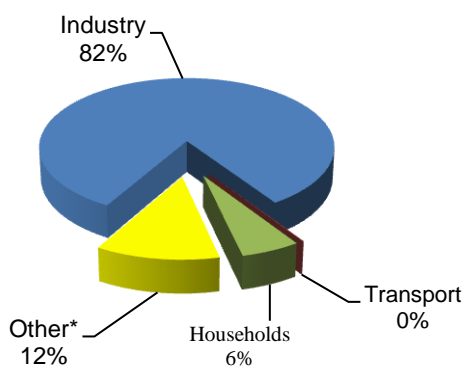
Coal**

**Total Final Consumption from 2 000 to 2 015
by sector (ktoe)**



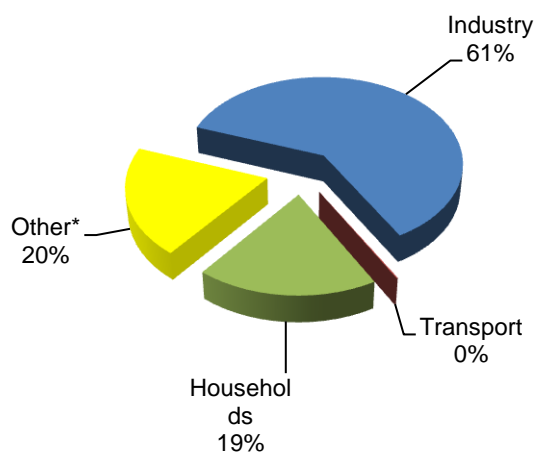
2 000 and 2 015 shares of Africa coal consumption**

2 000



11 555 ktoe

2 015



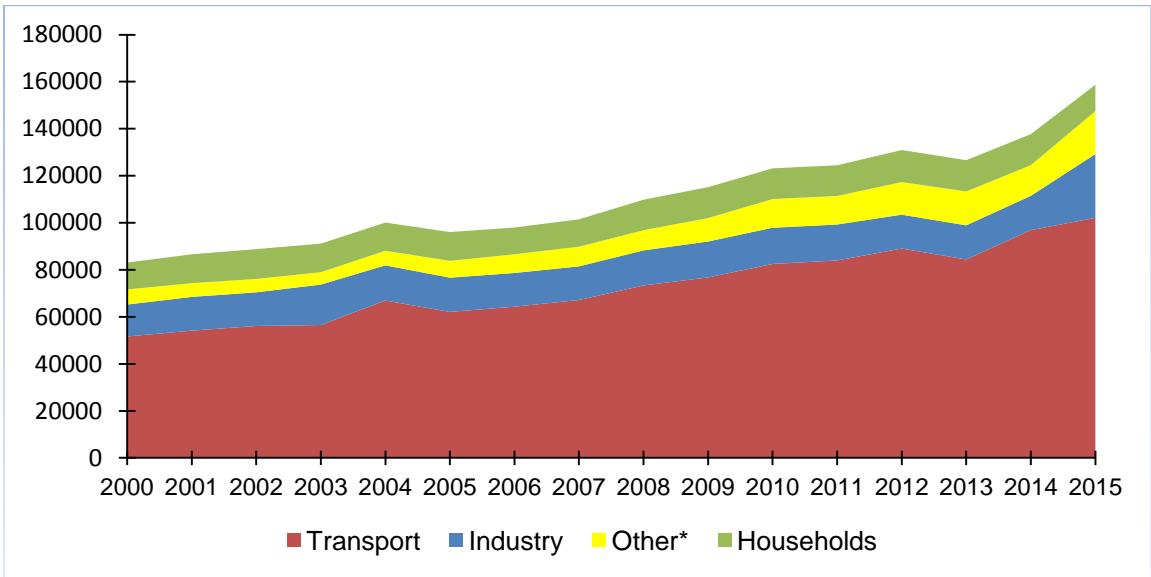
9 558 ktoe

* Includes agriculture, commercial, public service, and non-specified other

** Includes steam coal, coking coal, lignite and recovered coal

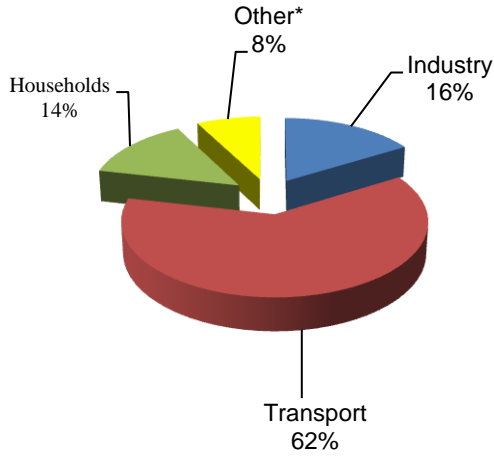
Oil

**Total Final Consumption from 2 000 to 2 015
by sector (ktoe)**



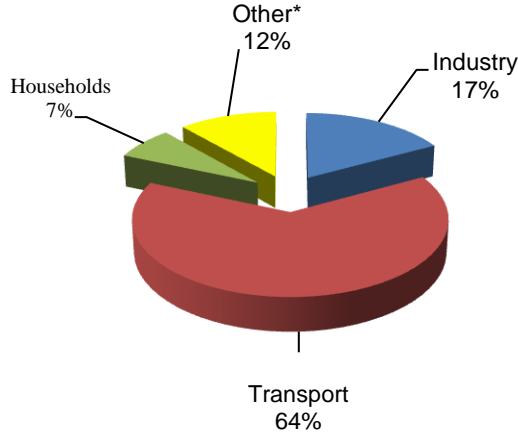
2 000 and 2 015 Shares of Africa Oil Consumption

2 000



51 670 ktoe

2 015

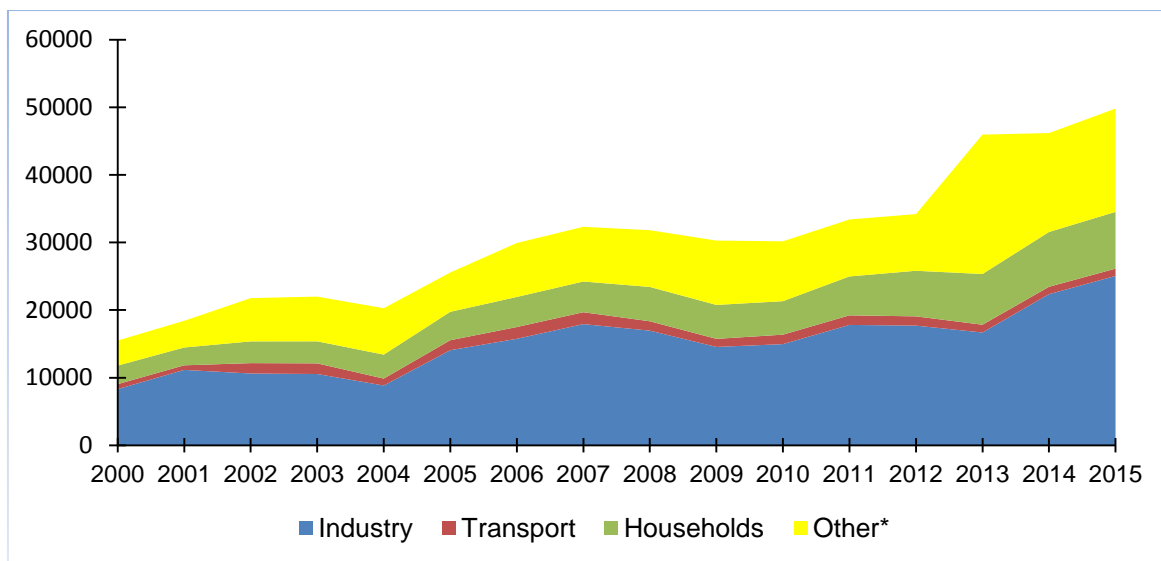


102 113 ktoe

** Includes agriculture, commercial, public service, and non-specified other*

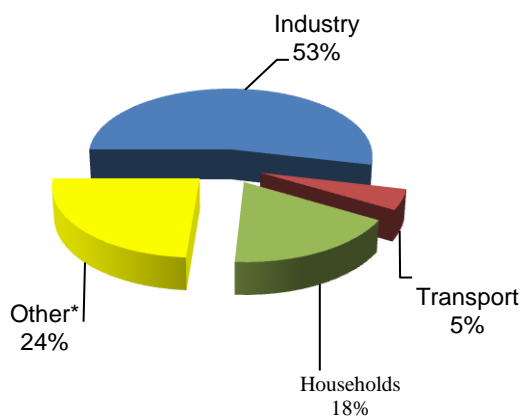
Natural gas

**Total Final Consumption from 2 000 to 2 015
by sector (ktoe)**



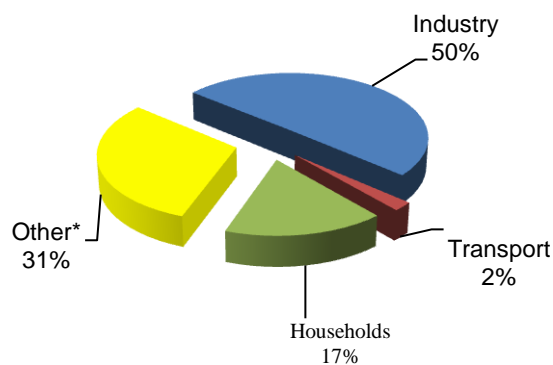
2 000 and 2 015 Shares of Africa Natural Gas Consumption

2 000



8 316 ktoe

2 015

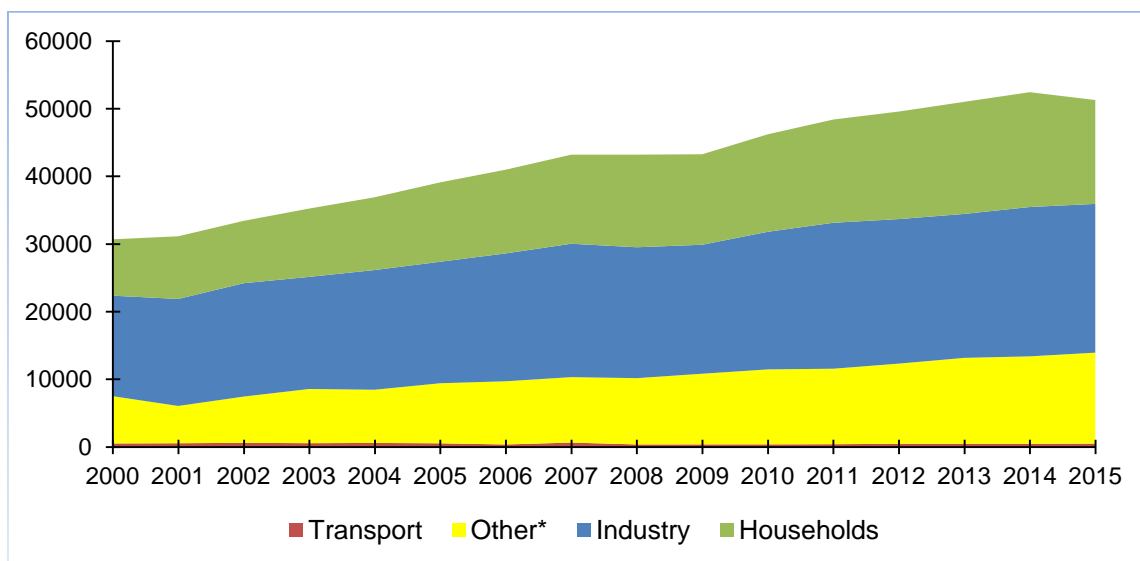


25 055 ktoe

* Includes agriculture, commercial, public service, and non-specified other

Electricity

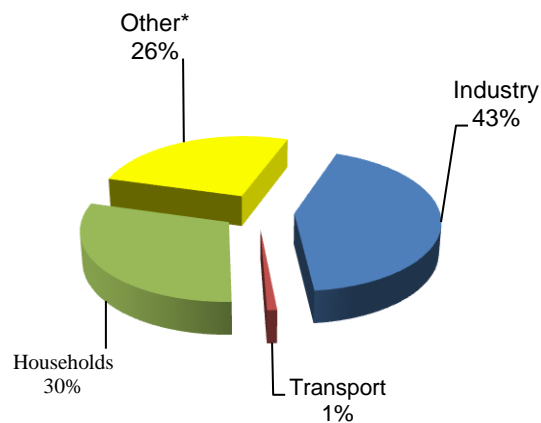
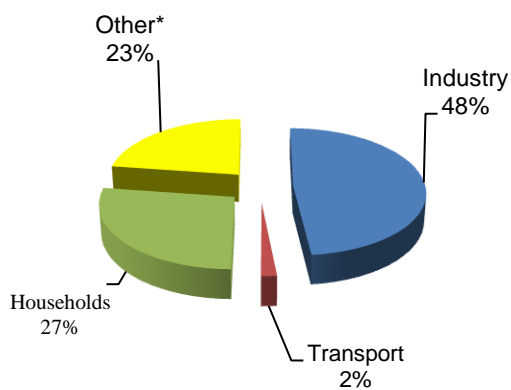
**Total Final Consumption from 2 000 to 2 015
by sector (ktoe)**



2 000 and 2 015 shares of Africa electricity consumption

2 000

2 015



14 852 ktoe

21 986 ktoe

* Includes agriculture, commercial, public service, and non-specified other

SIMPLIFIED ENERGY BALANCE TABLE

AFRICA

2 000

| Thousand Tonnes of Oil Equivalent (ktoe) | | Crude Oil | Oil Products | Coal / peat | Natural Gas | Nuclear | Hydro | Wind & Geothermal & Solar PV | Biofuels and Waste | Electricity | Total |
|--|--------------------------------|-----------------|----------------|----------------|----------------|---------------|---------------|------------------------------|--------------------|---------------|-----------------|
| PRIMARY SUPPLY | Production | 353 734 | 0 | 116 021 | 114 822 | 3 390 | 6 607 | 394 | 154 433 | 0 | 749 402 |
| | Imports | 25 682 | 23 037 | 3 250 | 1 563 | 0 | 0 | 0 | 0 | 1 129 | 54 661 |
| | Exports | -279 749 | -36 492 | -35 919 | -58 226 | 0 | 0 | 0 | 0 | -1 124 | -411 509 |
| | Intl. Marine Bunkers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Intl. Aviation Bunkers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Stock Changes | 7 938 | 646 | 931 | 0 | 0 | 0 | 0 | 0 | 0 | 9 515 |
| | TPES | 107 605 | -12 809 | 84 283 | 58 159 | 3 390 | 6 607 | 394 | 154 433 | 6 | 402 068 |
| | Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Statistical difference. | 1 449 | 1 633 | -899 | -12 086 | 0 | 0 | 0 | 7 620 | 1 224 | -1 058 |
| TRANSFORMATION | Transformation | -107 808 | 94 305 | -67 268 | -21 983 | -3 390 | -6 607 | -394 | -60 024 | 37 840 | -135 328 |
| | Electricity Producers | -233 | -11 037 | -67 268 | -21 983 | -3 390 | -6 607 | -394 | -1 391 | 37 840 | -74 463 |
| | Petroleum Refineries | -107 574 | 105 342 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -2 233 |
| | Charcoal Plants | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -58 633 | 0 | -58 633 |
| | Gas-To-Liquids | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Coal-To-Liquids | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other Transformation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Energy Industry Own Use | -434 | -1 755 | -28 | -9 994 | 0 | 0 | 0 | 0 | -3 726 | -15 936 |
| | Losses | -756 | 0 | -2 044 | -143 | 0 | 0 | 0 | 0 | -4 643 | -7 586 |
| FINAL CONSUMPTION | TFC | 56 | 81 375 | 14 046 | 13 953 | 0 | 0 | 0 | 130 071 | 30 701 | 270 202 |
| | Industry | 56 | 13 292 | 11 555 | 7 485 | 0 | 0 | 0 | 2 997 | 14 852 | 50 236 |
| | Transport | 0 | 50 569 | 10 | 663 | 0 | 0 | 0 | 0 | 529 | 51 770 |
| | Households | 0 | 11 212 | 805 | 2 467 | 0 | 0 | 0 | 119 099 | 8 332 | 141 914 |
| | Com. & Public Service | 0 | 1 133 | 419 | 1 655 | 0 | 0 | 0 | 6 447 | 3 928 | 13 583 |
| | Agriculture/Forestry | 0 | 2 392 | 251 | 0 | 0 | 0 | 0 | 0 | 929 | 3 573 |
| | Others (Non Specified) | 0 | 2 770 | 0 | 1 684 | 0 | 0 | 0 | 1 529 | 2 132 | 8 114 |
| | Non-Energy Use | 0 | 6 | 1 006 | 0 | 0 | 0 | 0 | 0 | 0 | 1 012 |

SIMPLIFIED ENERGY BALANCE TABLE

AFRICA

2015

| Thousand Tonnes of Oil Equivalent (ktoe) | | Crude Oil | Oil Products | Coal / peat | Natural Gas | Nuclear | Hydro | Wind & Geothermal & Solar PV | Biofuels and Waste | Electricity | Total |
|--|------------------------|-----------------|----------------|----------------|----------------|---------------|----------------|------------------------------|--------------------|----------------|-----------------|
| PRIMARY SUPPLY | Production | 349 200 | - | 139 313 | 160 208 | 3 188 | 10 681 | 4 784 | 334 694 | - | 1 002 068 |
| | Imports | 25 262 | 93 012 | 4 725 | 12 800 | - | - | - | - | 1 398 | 137 198 |
| | Exports | -279 749 | -14 081 | -40 812 | -65 923 | - | - | - | - | -642 | -401 207 |
| | Intl. Marine Bunkers | - | -6 267 | - | - | - | - | - | - | - | -6 267 |
| | Intl. Aviation Bunkers | - | -6 907 | - | - | - | - | - | - | - | -6 907 |
| | Stock Changes | 3 312 | 642 | - | - | - | - | - | - | - | 3 954 |
| | TPES | 98 025 | 66 400 | 103 226 | 107 085 | 3 188 | 10 681 | 4 784 | 334 694 | 756 | 728 839 |
| Transfers | - | - | - | - | - | - | - | - | - | - | |
| Statistical difference. | 6 008 | -1 606 | -434 | -629 | - | - | - | 3 498 | -1 910 | 4 925 | |
| TRANSFORMATION | Transformation | -102 352 | 90 736 | -81 039 | -57 276 | -3 188 | -10 681 | -4 784 | -105 217 | 67 313 | -206 488 |
| | Electricity Producers | -654 | -10 048 | -71 255 | -57 039 | -3 188 | -10 681 | -4 784 | 0 | 67 313 | -90 335 |
| | Petroleum Refineries | -101 698 | 100 784 | - | - | - | - | - | - | - | -915 |
| | Charcoal Plants | - | - | - | - | - | - | - | -105 217 | - | -105 217 |
| | Gas-To-Liquids | - | - | - | - | - | - | - | - | - | - |
| | Coal-To-Liquids | - | - | - | - | - | - | - | - | - | - |
| | Blast Furnaces | - | - | - | - | - | - | - | - | - | - |
| | Other Transformation | - | - | -9 785 | -236 | - | - | - | - | - | -10 021 |
| Energy Industry Own Use | -607 | -150 | -6 131 | -3 806 | - | - | - | - | -4 438 | -15 132 | |
| Losses | -934 | -17 | - | -549 | - | - | - | - | -10 436 | -11 935 | |
| FINAL CONSUMPTION | TFC | 140 | 155 362 | 15 622 | 44 826 | - | - | - | 293 604 | 51 285 | 560 838 |
| | Industry | 140 | 26 598 | 9 558 | 22 549 | - | - | - | 5 856 | 21 986 | 86 687 |
| | Transport | - | 99 938 | 22 | 973 | - | - | - | - | 505 | 101 439 |
| | Households | - | 10 967 | 2 935 | 7 556 | - | - | - | 271 742 | 15 348 | 308 548 |
| | Com. & Public Service | - | 10 001 | 1 554 | 3 437 | - | - | - | 16 006 | 10 054 | 41 051 |
| | Agriculture/Forestry | - | 4 286 | 218 | 2 062 | - | - | - | - | 2 713 | 9 279 |
| | Others (Non Specified) | - | 3 572 | 93 | 7 561 | - | - | - | - | 678 | 11 904 |
| | Non-Energy Use | - | - | 1 243 | 687 | - | - | - | - | - | 1 930 |

CONVERSION FACTORS

(Source: IEA)

General Conversion Factors for Energy

| To: | TJ | Gcal | Mtoe | MBtu | GWh |
|-------|-------------------------|--------|------------------------|---------------------|------------------------|
| From: | Multiply by : | | | | |
| TJ | 1 | 238.8 | 2.388×10^{-5} | 947.8 | 0.2778 |
| Gcal | 4.1868×10^{-3} | 1 | 10^{-7} | 3.968 | 1.163×10^{-3} |
| Mtoe | 4.1868×10^4 | 10^7 | 1 | 3.968×10^7 | 11630 |
| MBtu | 1.0551×10^{-3} | 0.252 | 2.52×10^{-8} | 1 | 2.931×10^{-4} |
| GWh | 3.6 | 860 | 8.6×10^{-5} | 3412 | 1 |

Conversion Factors for Mass

| To: | kg | t | lt | st | lb |
|-----------------|---------------|-----------------------|-----------------------|------------------------|-------------|
| From: | Multiply by : | | | | |
| kilogramme (kg) | 1 | 0.001 | 9.84×10^{-4} | 1.102×10^{-3} | 2.2046 |
| tonne (t) | 1 000 | 1 | 0.984 | 1.1023 | 2 204.6 |
| long ton (lt) | 1 060 | 1.016 | 1 | 1.120 | 2 240.0 |
| short ton (st) | 907.2 | 0.9072 | 0.893 | 1 | $2 000.0^4$ |
| pound (lb) | 0454 | 4.54×10^{-4} | 4.46×10^{-4} | 5.0×10^{-4} | 1 |

Conversion Factors for Volume

| To: | gal U.S. | gal U.K. | bbl | Ft ³ | l | m ³ |
|-------------------------------|---------------|----------|---------|-----------------|--------|----------------|
| From: | Multiply by : | | | | | |
| U.S. gallon (gal) | 1 | 0.8327 | 0.02381 | 0.1337 | 3.785 | 0.0038 |
| U.K. gallon (gal) | 1.201 | 1 | 0.02859 | 0.1605 | 4.5466 | 0.0045 |
| barrel (bbl) | 42.0 | 34.97 | 1 | 5.615 | 159.0 | 0.159 |
| cubic foot (ft ³) | 7.48 | 6.229 | 0.1781 | 1 | 28.3 | 0.0283 |
| litre(l) | 0.2642 | 0.220 | 0.0063 | 0.0353 | 1 | 0.001 |
| cubic metre (m ³) | 264.2 | 220.0 | 6.289 | 35.3147 | 1 000 | 1 |

GLOSSARY

(Source: IEA)

Coal/peat

Coal/peat includes all coal primary (including hard coal and lignite) and derived fuels (including patent fuel, coke oven coke, gas coke, BKB, gas works gas, coke oven gas, blast furnace gas and other recovered gases). Peat is also included in this category.

Hard coal

Hard coal comprises anthracite coking coal and other bituminous coal

Steam coal

Steam coal comprises anthracite, other bituminous coal and sub-bituminous coal.

Crude oil

Crude oil comprises crude oil, natural gas liquids, refinery feedstock and additives as well as other hydrocarbons.

Oil products

Oil products comprise refinery gas liquids, refinery feedstock and additives as well as other hydrocarbons.

Oil products

Oil products comprises refinery gas, ethane, LPG, aviation gasoline, motor gasoline, jet fuels, kerosene, gas/diesel oil, fuel oil, naphtha, white spirit, lubricants, bitumen, paraffin waxes, petroleum coke and other oil products.

Natural gas

Natural gas includes both “associated” and “non-associated” gas.

Nuclear

Nuclear shows the primary heat equivalent of the electricity produced by a nuclear power plant with an average thermal efficiency of 33%

Hydro

Hydro shows the energy content of the electricity produced in hydro power plants hydro output excludes output from pumped storage plants.

Biofuels and waste

Biofuels and waste comprises solid biofuels liquid biofuels, biogases, industrial waste and municipal waste. Biofuels are defined as any plant matter used directly as fuel or converted into fuels (e.g., charcoal) or electricity and/or heat. Included here are wood, vegetal waste (including wood waste and crops used for energy production), ethanol, animal materials/ wastes and sulphite lyes. Municipal waste comprises wastes produced by residential, commercial and public services that are collected by local authorities for disposal in a central location for the production of heat and/or power.

Other

Other includes geothermal, solar, wind, tide/wave/ocean energy, electricity and heat. Unless the actual efficiency of the geothermal process is known, the quantity of geothermal energy entering electricity generation is inferred from the electricity production at geothermal plants assuming an average thermal efficiency of 10% For solar, wind and tide/Wave/ocean energy, the quantities entering electricity generation are equal to the electrical energy generated. Direct use of geothermal and solar heat is also included here. Electricity is accounted for at the same heat value as electricity in final consumption (i.e., 1GWh = 0.000086 Mtoe). Heat includes heat that is produced for sale and is accounted for in the transformation sector.

Production

Production is the production of primary energy, i.e., hard coal, lignite, peat, crude oil, NGLs, natural gas, biofuels and waste, nuclear, hydro, geothermal, solar and the heat from heat pumps that is extracted from the ambient environment production is calculated after removal of impurities (e.g., sulphur from natural gas).

Imports and exports

Imports and exports comprise amounts having crossed the national territorial boundaries of the country, whether or not customs clearance has taken place.

a) Oil and natural gas

Quantities of crude oil and oil products imported or exported under processing agreements (i.e., refining on account) are included. Quantities of oil in transit are excluded. Crude oil, NGL and natural gas are reported as coming from the country of origin; refinery feedstock and oil products are reported as coming from the country of last consignment. Re-exports of oil imported for processing within bonded areas are shown as exports of product from the processing country to the final destination.

b) Coal/peat

Imports and exports comprise the amount of fuels obtained from or supplied to other countries, whether or not there is an economic or customs union between the relevant countries. Coal in transit is not included.

c) Electricity

Amounts are considered as imported or exported when they have crossed the national territorial boundaries of the country.

International marine bunkers

International marine bunkers cover those quantities delivered to ships of all flags that are engaged in international navigation. The international navigation may take place at sea, on inland lakes and waterways, and in coastal waters. Consumption by ships engaged in domestic navigation is excluded. The domestic/International split is determined on the basis of port of departure and port of arrival, and not by the flag or nationality of the ship. Consumption by fishing vessels and by military forces is also excluded.

International aviation bunkers

International aviation bunkers covers deliveries of aviation fuels to aircraft for international aviation. Fuels used by airlines for their road vehicles are excluded. The domestic/International split should be determined **ON THE BASIS OF DEPARTURE AND LANDING LOCATIONS AND NOT BY THE NATIONALITY OF THE AIRLINE**; For many countries this incorrectly excludes fuel used by domestically owned carriers for their international departures.

Stock changes

Stock changes reflects the difference between opening stock levels on the first day of the year and closing levels on the last day of the year of stocks on national territory held by producers, importers, energy transformation industries and large consumers. A stock build is shown as a negative number, and a stock draw as a positive number.

Total primary energy supply (TPES)

Total primary energy supply (TPES) is made up of production + imports – exports – international marine bunkers – international aviation bunkers ± stock changes. For the world total, international marine bunkers and international aviation bunkers are not subtracted from TPES.

Transfers

Transfers includes both inter-product transfers, products transferred and recycled products.

Statistical differences

Statistical differences include the sum of the unexplained statistical differences for individual fuels, as they appear in the basic energy statistics. It also includes the statistical differences that arise because of the variety of conversion factors in the coal/peat and oil columns.

Electricity plants

Electricity plants refer to plants which are designed to produce electricity only. If one or more units of the plant is a CHP unit (and the inputs and outputs cannot be distinguished on a unit basis) then the whole plant is designated as a CHP plant. Both main activity producers and auto producer plants are included here.

Combined heat and power plants

Combined heat and power plants refers to plants which are designed to produce both heat and electricity. Sometimes referred to as cogeneration power stations. If possible, fuel inputs and electricity/heat outputs are on a unit basis rather than on a plant basis. However, if data are not available on a unit basis, the convention for defining a CHP plant noted above is adopted. Both main activity producers and auto producer plants are included here.

Blast furnaces

Blast furnaces contain inputs to and outputs of fuels from blast furnaces.

Gas works

Gas works is treated similarly to electricity generation, with the quantity produced appearing as a positive figure in the coal/peat column or the natural gas column after blending with natural gas, inputs as negative entries in the coal/peat and oil products columns, and conversion losses appearing in the total column.

Coke ovens

Coke ovens contain losses in transformation of coal from primary to secondary fuel and from secondary to tertiary fuels (hard coal to coke and patent fuel, lignite to BKB, etc.).

Oil refineries

Oil refineries show the use of primary energy for the manufacture of finished oil products and the corresponding output. Thus, the total reflects transformation losses. In certain cases the data in the total column are positive numbers. This can be due to either problem in the primary refinery balance or to the fact that the IEA uses regional net calorific values for oil products.

Petrochemical plants

Petrochemical plants covers backflows returned from the petrochemical industry. Note that backflows from oil products that are used for non-energy purposes (i.e white spirit and lubricants) are not included here, but in non-energy use.

Liquefaction plants

Liquefaction plants include diverse liquefaction processes, such as coal liquefaction plants and gas-to-liquid plants.

Other transformation

Other transformation covers non-specified transformation not shown elsewhere, such as the transformation of primary solid biofuels into charcoal.

Energy industry own use

Energy industry own use contains the primary and secondary energy consumed by transformation industries for heating, pumping, traction and lighting purposes (ISIC 05, 06, 19 and 35, Group 091 and Classes 0892 and 0721).

Losses

Losses include losses in energy distribution, transmission and transport.

Total final consumption (TFC)

Total final consumption (TFC) is the sum of consumption by the different end-use sectors; Backflows from the petrochemical industry are not included in final consumption.

Industry

Industry consumption is specified in the following subsectors (energy used for transport by industry is not included here but reported under transport):

- Iron and steel industry [ISIC Group 241 and Class 2431];
- Chemical and petrochemical industry [ISIC Divisions 20 and 21] excluding petrochemical feedstock;
- Non-ferrous metals basic industries [ISIC Group 242 and class 2432];
- Non-metallic minerals such as glass, ceramic, cement, etc. [ISIC Division 23];
- Transport equipment [ISIC Divisions 29 and 30];
- Machinery comprises fabricated metal product, machinery and equipment other than transport equipment [ISIC Divisions 25 to 28]

Industry (ctd.)

- Mining (excluding fuels) and quarrying [ISIC Divisions 07 and 08 and Group 099];
- Food and tobacco [ISIC Divisions 10 and 12];
- Paper, pulp and printing [ISIC Divisions 17 and 18];
- Wood and wood products (other than pulp and paper) [ISIC Division 16];
- Construction [ISIC Divisions 41 and 43];
- Textile and leather [ISIC Divisions 13 to 15];
- Non-specified (any manufacturing industry not included above) [ISIC Divisions 22, 31 and 32].

Transport

Transport includes all fuels used for transport [ISIC Divisions 39 to 51]. It includes transport in industry and covers domestic aviation, road, rail, pipeline transport, domestic navigation and non-specified transport. Fuel used for ocean, coastal and inland fishing (included under fishing and military consumption (included in other non-specified) are excluded from transport.

Please note that international marine and international aviation bunkers are also included here for world total.

Other

Other covers residential, commercial and public services [ISIC Divisions 33, 36-39, 45-47, 52, 53, 56, 58-66, 68-75, 77-82, 84 (excluding Class 8422) 85-88, 90-99], agriculture/forestry [ISIC Divisions 01 and 02], fishing [ISIC Division 03] and non-specified consumption.

Non-energy use

Non-energy use covers those fuels that are used as raw materials in the different sectors and are not consumed as a fuel or transformed into another fuel. Non-energy use also includes petrochemical feedstock. Non-energy use is shown separately in final consumption under the heading non-energy use.

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