



**AFRICAN UNION**

AFRICAN ENERGY COMMISSION  
COMMISSION AFRICAINE DE L'ENERGIE  
COMISSAO AFRICANA D'ENERGIA

اللجنة الأفريقية للطاقة



# AFREC

## AFRICA ENERGY DATABASE



# 2015



# **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 2015 publication of “Key Africa Energy Statistics” following the 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 2015” which provides timely and clearly-presented data of the Africa’s energy supply and use in most cases from 2000 to 2013.

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 2015 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 and Internet versions have been produced. The main report of the Africa Energy Statistics 2015 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](http://www.afrec-energy.org).

## Unit Abbreviations

(Source: IEA)

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

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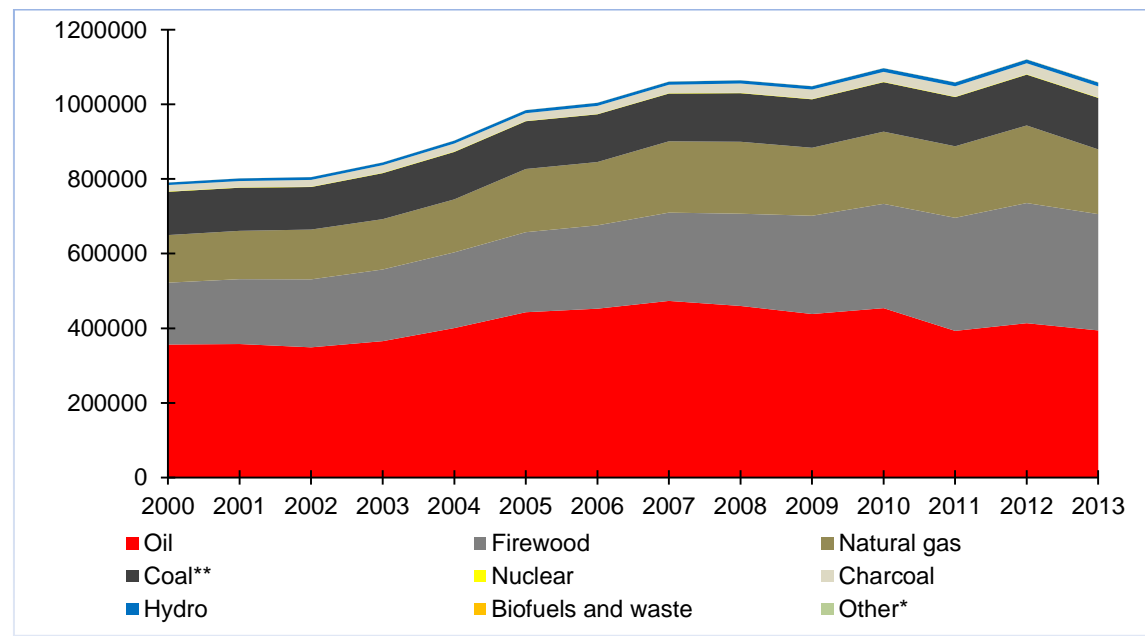
**GLOSSARY**

**6**

### TOTAL PRIMARY ENERGY SUPPLY BY FUEL

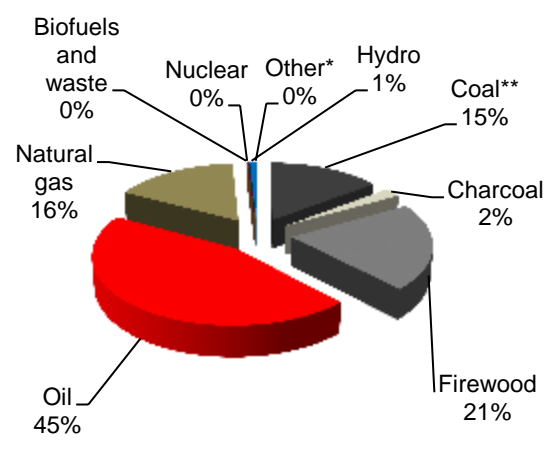
#### AFRICA

Africa Total Primary Energy Supply from 2 000 to 2 013 by fuel (ktoe)



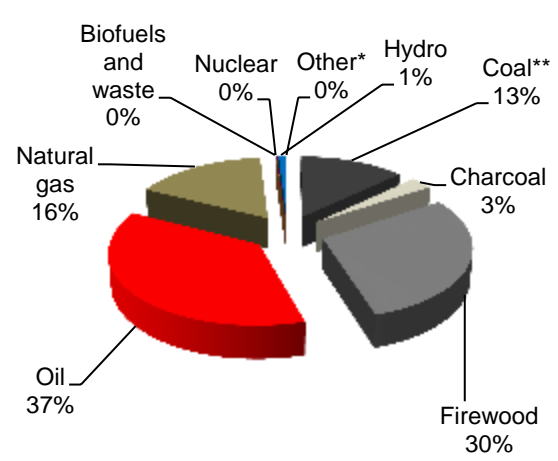
### 2 000 and 2 013 Fuel Shares of TPES

#### 2 000



356 367 ktoe

#### 2 013



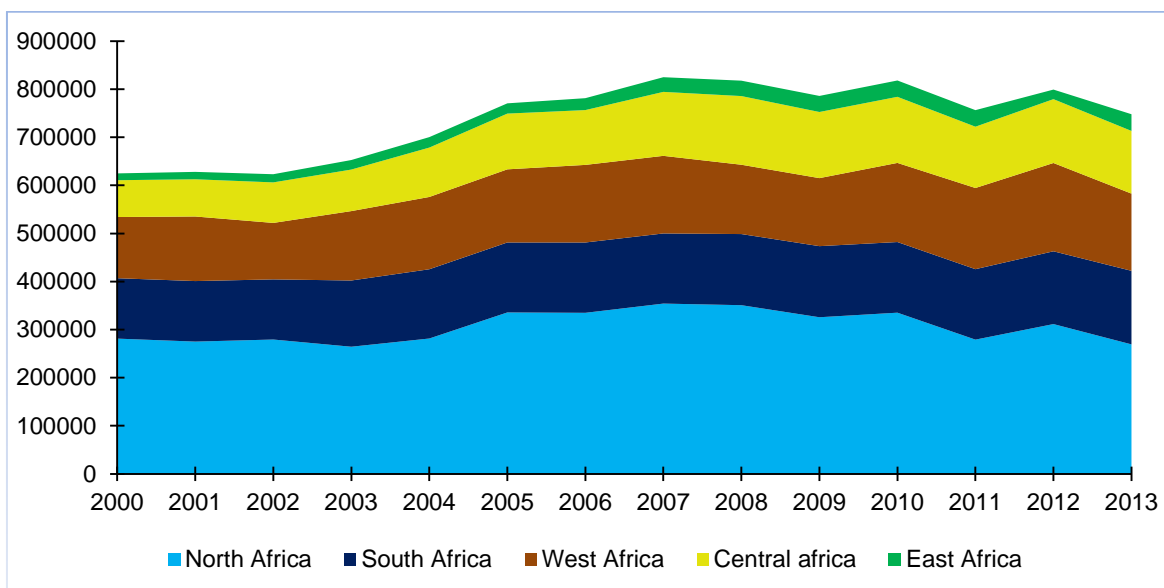
392 549 ktoe

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

## TOTAL PRIMARY ENERGY SUPPLY BY REGION

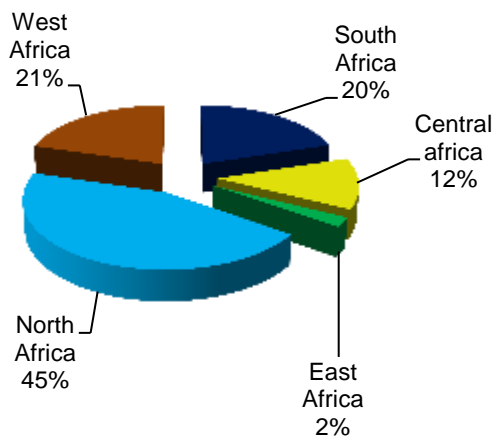
### AFRICA

Africa Total Primary Energy Supply from 2 000 to 2 013  
by region (ktoe)



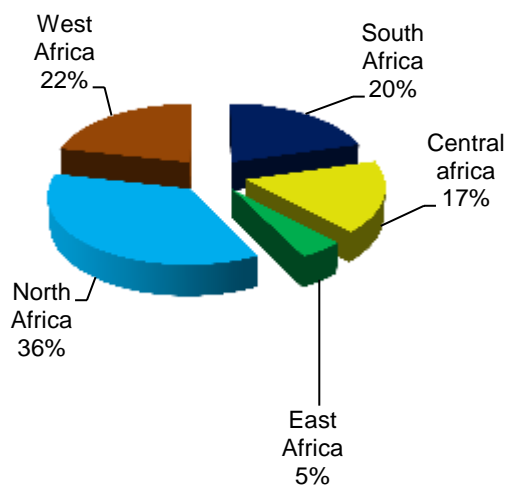
### 2 000 and 2 013 Regional Shares of TPES

**2 000**



281 309 ktoe

**2 013**



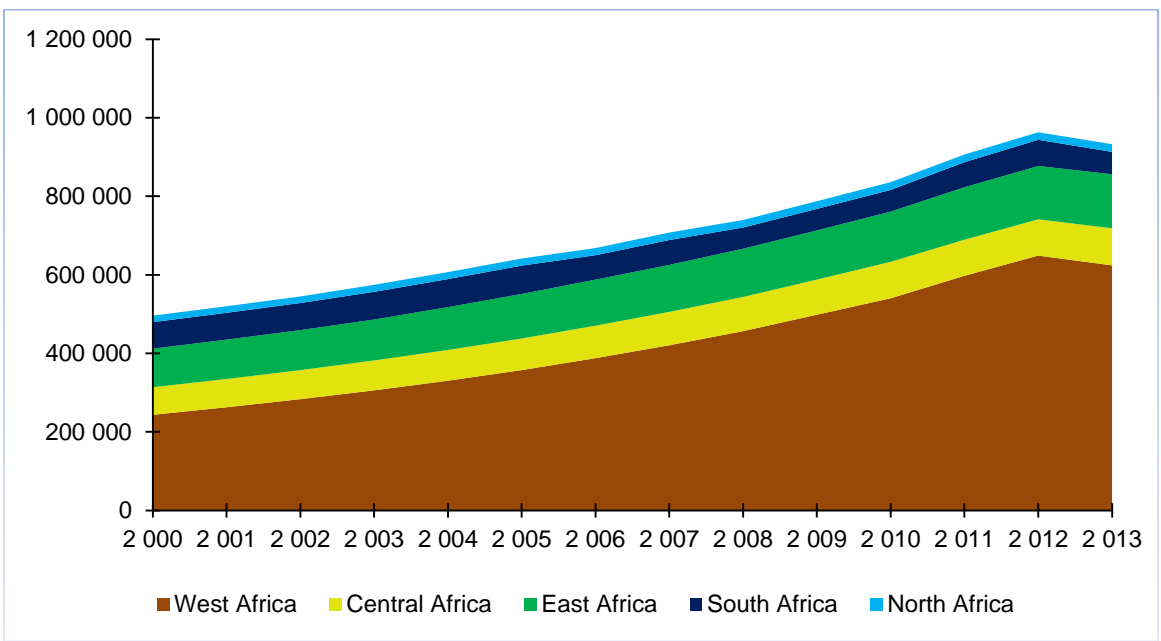
269 285 ktoe



# FIREWOOD PRODUCTION

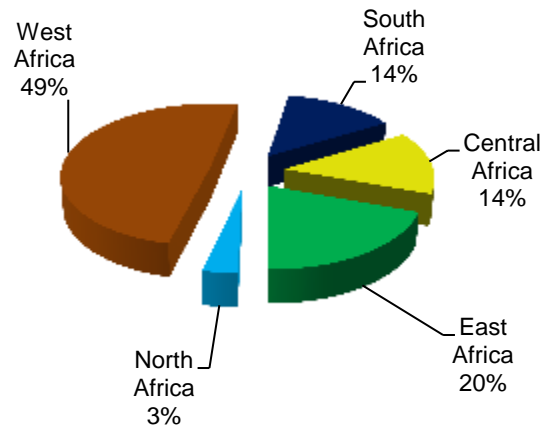
## AFRICA

Firewood Production from 2 000 to 2 013  
by region (kt)



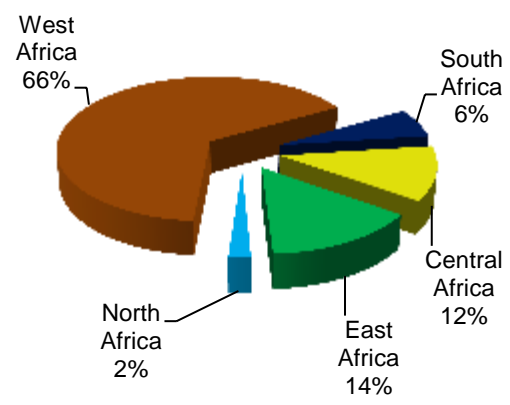
### 2 000 and 2 013 Regional Shares of Firewood Production

2 000



243 535 kt

2 013



624 037 kt

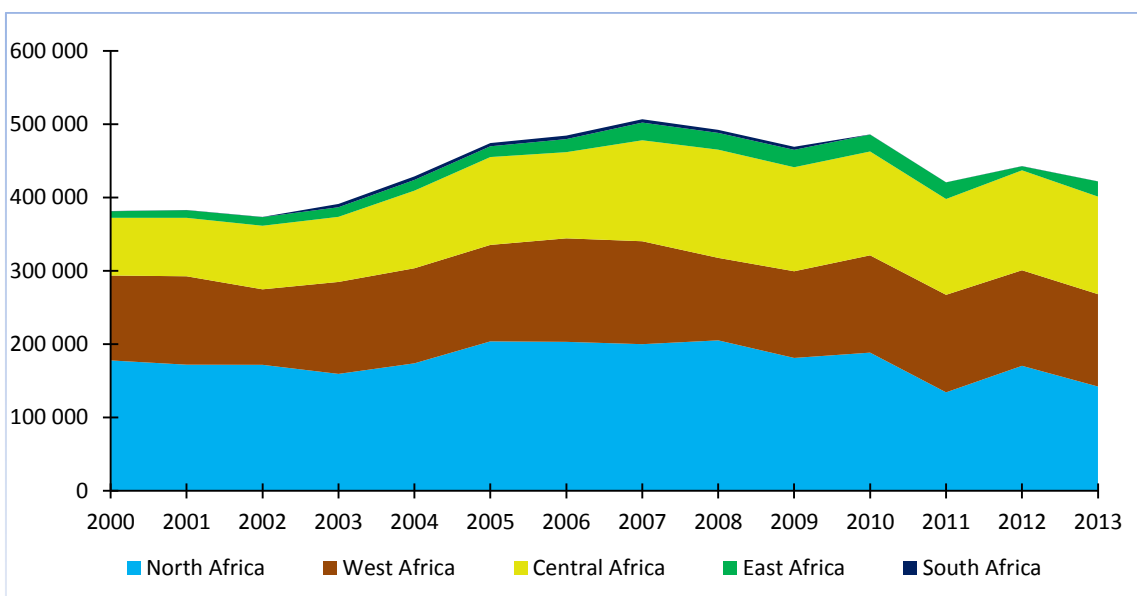
## Producers of firewood from 2 013

Producers	kt
Nigeria	467 834
Ethiopia	77 806
Congo DR	75 693
Niger	67 109
Mozambique	22 000
Côte d'Ivoire	20 860
Uganda	20 800
Ghana	20 724
Zimbabwe	12 964
Egypt	8 823
Mali	8 593
Togo	7 544
Madagascar	6 663
Guinea	6 059
Burkina Faso	5 789
Zambia	4 759
Sudan	4 378
Senegal	4 146
Rwanda	4 128
Chad	3 709
Swaziland	3 488
Burundi	2 871
Congo	2 850
Tunisia	2 716
Central Africa	2 620
South Sudan	2 192
Guinea Bissau	1 357
South Africa	982
Mauritania	981
Gabon	535
Gambia	361
Comoros	264
São Tome & Príncipe	55
Mauritius	18
Seychelles	2
<b>Other Africa</b>	82 125
<b>Africa</b>	<b>953 799</b>

# CRUDE OIL PRODUCTION

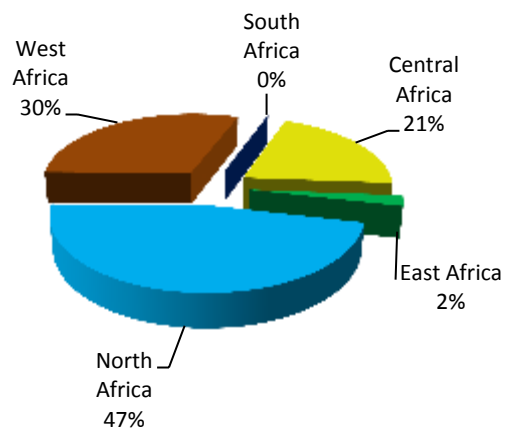
## AFRICA

Crude Oil\* Production from 2 000 to 2 013  
by region (kt)



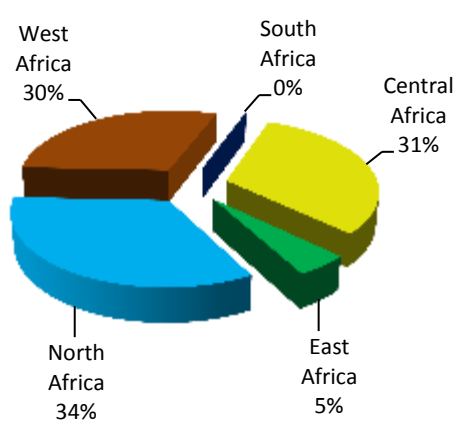
### 2 000 and 2 013 Regional Shares of Crude Oil\* Production

**2 000**



**177 908 kt**

**2 013**



**142 294 kt**

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

## Producers, Net Exporters and Net Importers of Crude Oil\* from 2 013

Producers	kt
Nigeria	118 332
Angola	85 060
Algeria	58 172
Libya	48 133
Egypt	32 829
South Sudan	13 100
Equatorial Guinea	12 855
Congo	12 153
Gabon	11 835
Sudan	7 557
Chad	5 658
Ghana	5 267
Tunisia	3 153
Cameroon	2 691
Côte d'Ivoire	1 193
Congo DR	1 145
Niger	890
Mauritania	307
South Africa	151
Morocco	7
<b>Africa</b>	<b>420 488</b>

Net exporters	kt
Nigeria	109 201
Angola	83 108
Algeria	33 546
Libya	29 329
Guinea Equatorial	14 869
Congo	12 445
Gabon	10 348
Egypt	6 532
Chad	4942
Ghana	3 964
South Sudan	3 486
Congo DR	1 144
Tunisia	1 126
Sudan	991
Cameroon	522
Mauritania	214
Mozambique	34
<b>Africa</b>	<b>315 802</b>

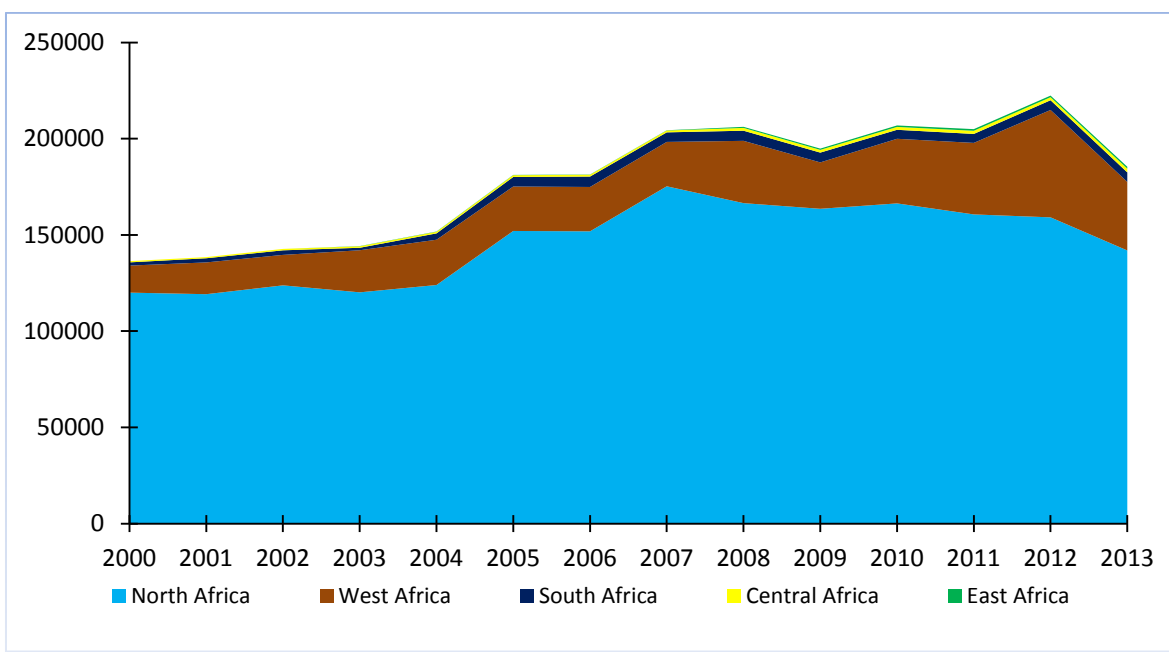
Net Importers	kt
South Africa	20 932
Morocco	7 161
Côte d'Ivoire	3 635
Kenya	1 942
Senegal	817
Zambia	767
<b>Africa</b>	<b>35 254</b>

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

## NATURAL GAS PRODUCTION

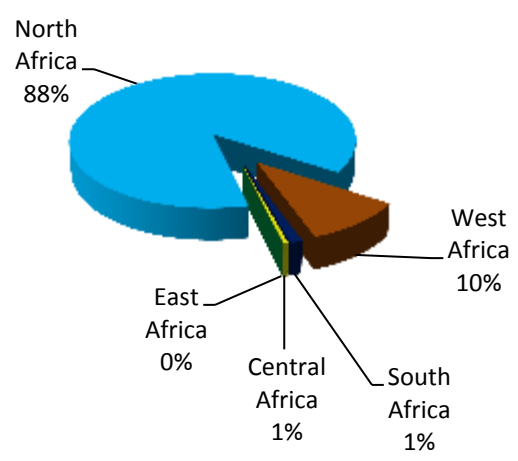
### AFRICA

Natural gas production from 2 000 to 2 013  
by region (Million cubic meters)



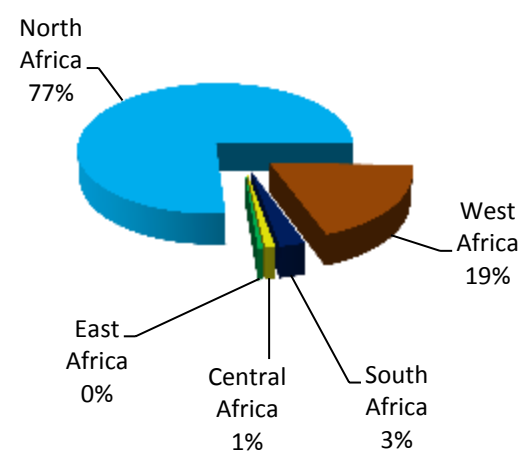
2 000 and 2 013 Regional Shares of Natural Gas Production

2 000



120 017 Mcm

2 013



141 925 Mcm

## Producers, Net Exporters and Net Importers\* Of Natural Gas from 2 013

Producers	Mcm
Algeria	81 543
Egypt	49 866
Nigeria	33 397
Libya	7 611
Mozambique	3 809
Tunisia	2 826
Côte d'Ivoire	2 162
South Africa	1 140
Tanzania	965
Angola	859
Gabon	370
Cameroon	336
Equatorial Guinea	243
Congo	152
Morocco	80
Senegal	41
Congo DR	9
<b>Africa</b>	<b>185 407</b>

Net exporters	Mcm
Algeria	47 392
Nigeria	21 138
Libya	5 534
Egypt	3 796
Mozambique	3 643
Angola	249
<b>Africa</b>	<b>81 752</b>

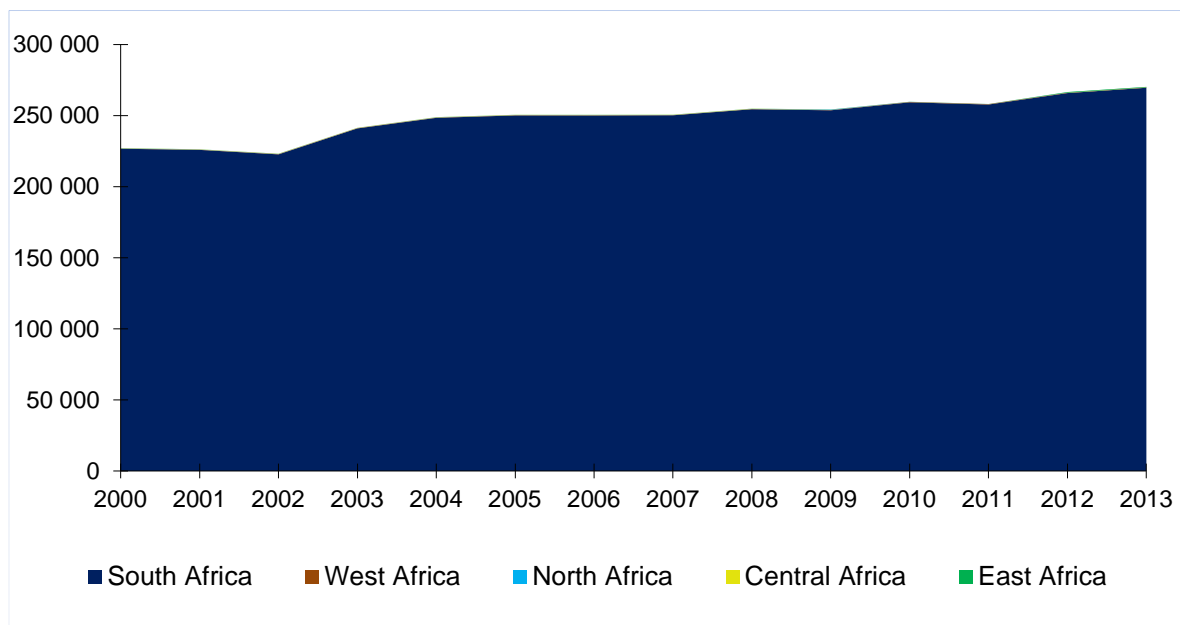
Net importers	Mcm
South Africa	3 658
Tunisia	2 472
Morocco	1 116
Ghana	312
<b>Africa</b>	<b>7 559</b>

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

### COAL PRODUCTION

#### AFRICA

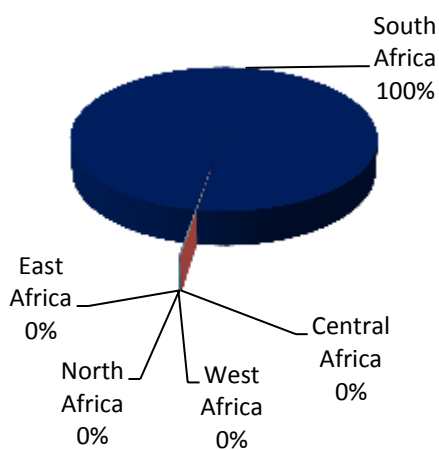
Coal\* Production from 2 000 to 2 013  
by region (kt)



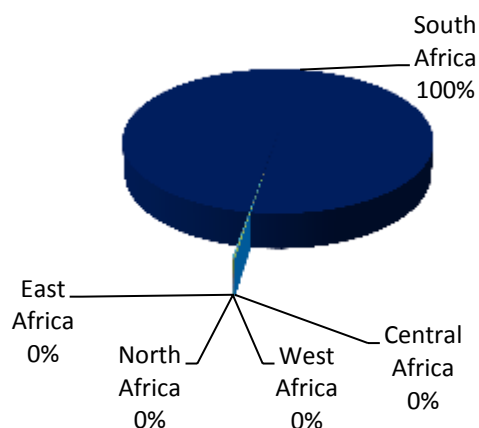
#### 2 000 and 2 013 Regional Shares of Coal\* Production

2 000

2 013



226 635 kt



269 529 kt

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

## Producers, Net Exporters and Net Importers of Coal\* from 2 013

Producers	kt
South Africa	257 795
Mozambique	5 992
Zimbabwe	3 357
Botswana	1 500
Zambia	400
Tanzania	270
Swaziland	257
Niger	242
Malawi	67
Nigeria	48
Ethiopia	30
<b>Africa</b>	<b>269 958</b>

Net exporters	kt
South Africa	71 755
Mozambique	3 865
Swaziland	132
Zimbabwe	132
<b>Africa</b>	<b>75 884</b>

Net importers	kt
Morocco	5716
Mauritius	708
Egypt	375
Kenya	350
Senegal	350
Algeria	242
Ethiopia	198
Namibia	28
Madagascar	15
<b>Africa</b>	<b>7 982</b>

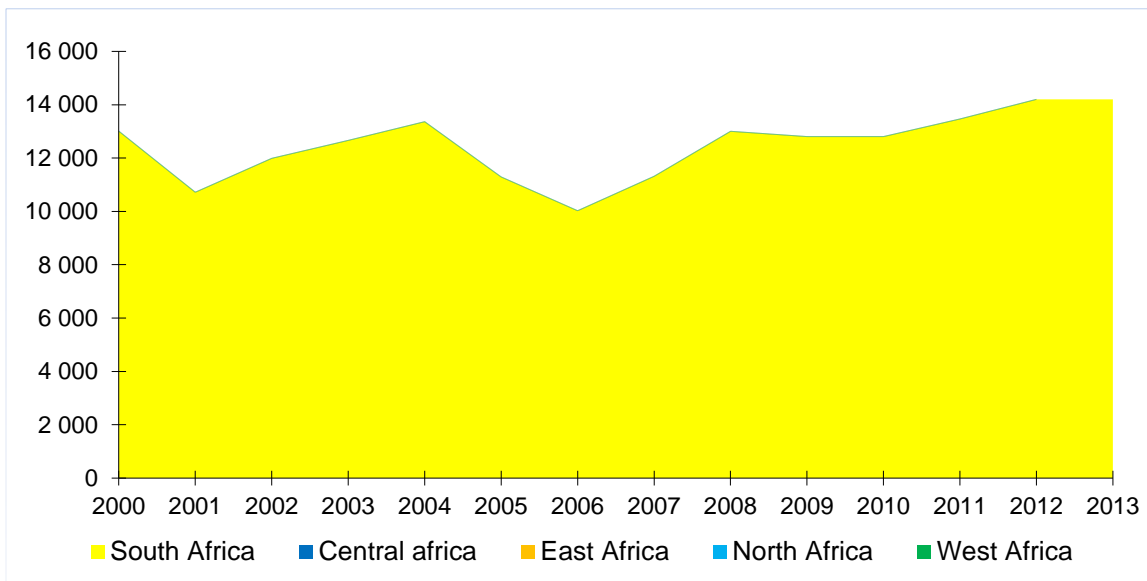
\*Includes steam coal, coking coal, lignite and recovered coal



# NUCLEAR PRODUCTION

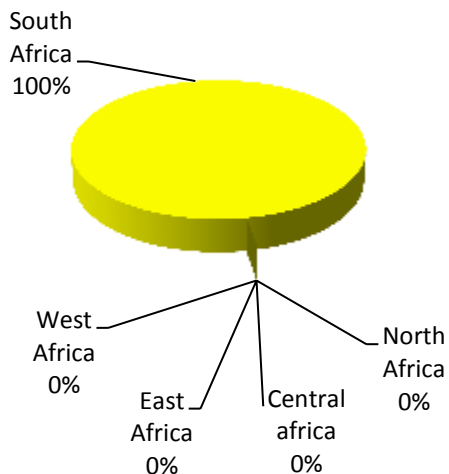
## AFRICA

Nuclear Production from 2 000 to 2 013  
by region (GWh)



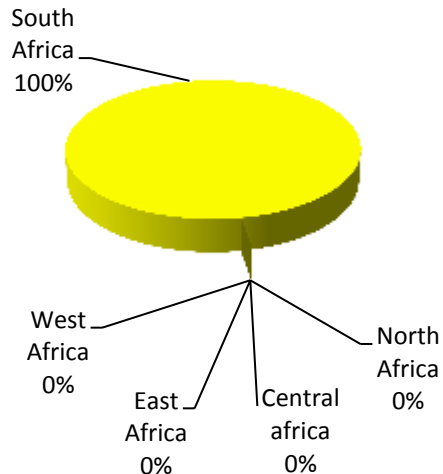
### 2 000 and 2 013 Regional Shares of Nuclear Production

2 000



13 010 GWh

2 013



14 202 GWh

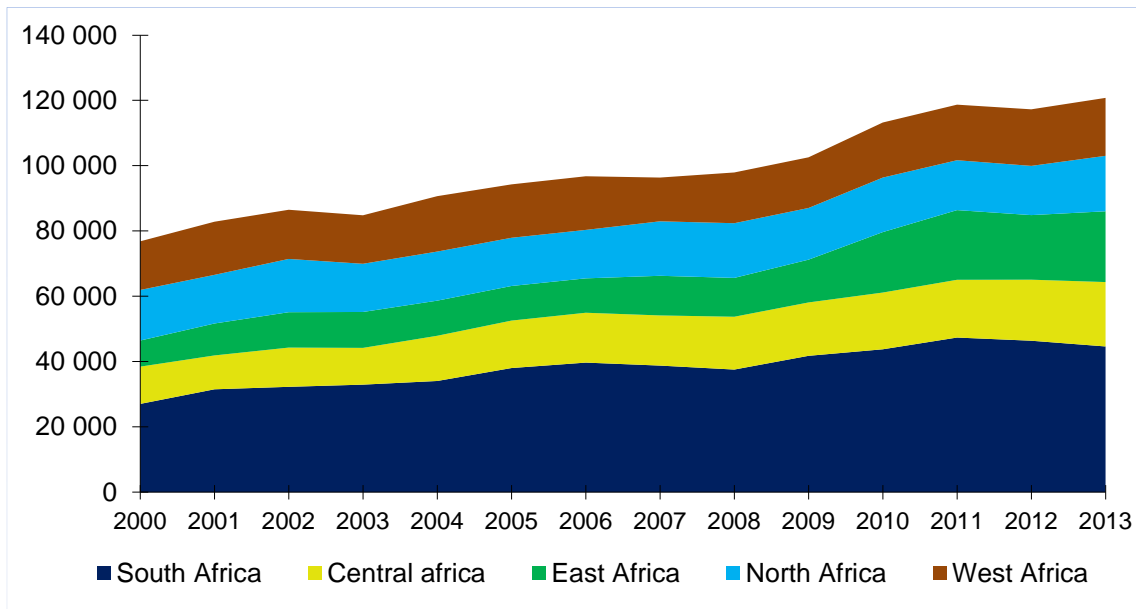
## Producers of Nuclear Electricity from 2 013

Producers	GWh
South Africa	14 202
<b>Africa</b>	<b>14 202</b>

# HYDRO PRODUCTION

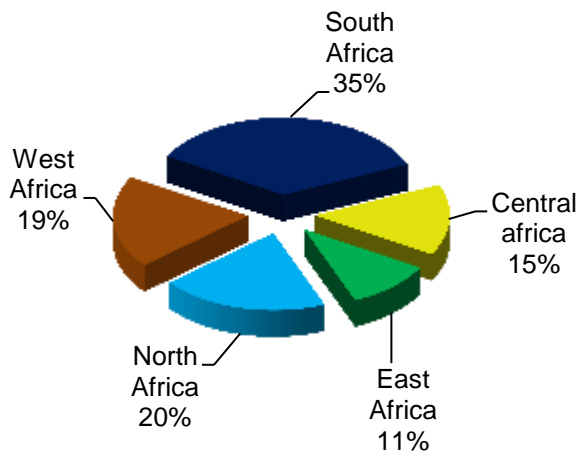
## AFRICA

Hydro production from 2 000 to 2 013  
by region (GWh)



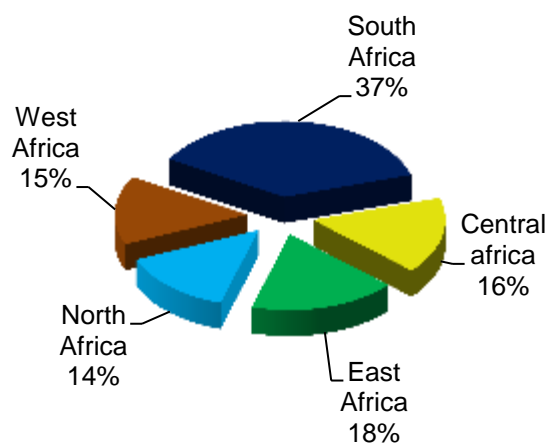
### 2 000 and 2 013 Regional Shares of Hydro Production

**2 000**



**27 046 GWh**

**2 013**



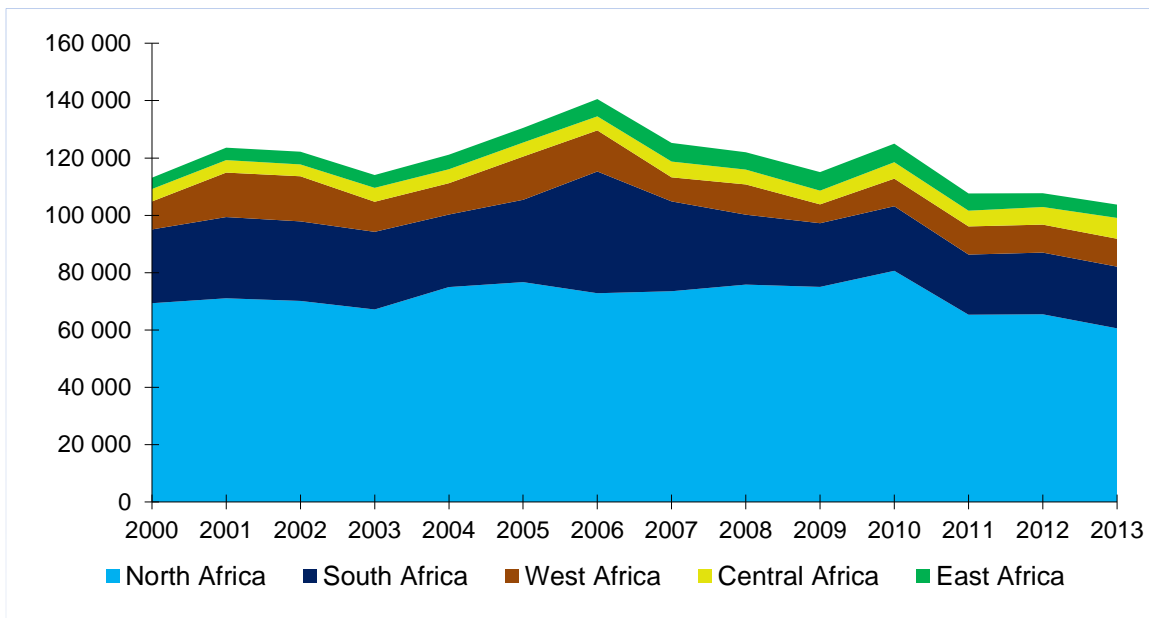
**44 636 GWh**

### Producers of Hydro Electricity from 2 013

Producers	GWh
Mozambique	14 542
Egypt	13 840
Zambia	11 134
Ghana	8 377
Sudan	8 233
South Africa	7 884
Congo DR	7 858
Ethiopia	7 306
Zimbabwe	5 844
Nigeria	5 267
Cameroon	4 783
Angola	4 588
Kenya	2 990
Madagascar	2 498
Morocco	2 393
Côte d'Ivoire	2 380
Malawi	1 914
Uganda	1 560
Tanzania	1 323
Namibia	1 082
Gabon	864
Congo	858
Mali	787
Guinea	580
Senegal	385
Lesotho	308
Sierra Leone	287
Swaziland	240
Tunisia	214
Burundi	179
Rwanda	142
Central Africa	138
Algeria	106
Mauritania	99
Mauritius	95
Burkina Faso	95
Togo	60
South Sudan	21
Equatorial Guinea	18
Somalia	11
São Tomé & Príncipe	11
Comoros	5
Benin	1
<b>Africa</b>	<b>121 300</b>

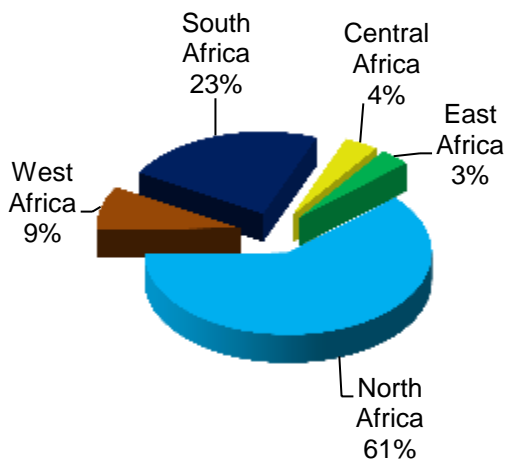
**REFINING BY REGION**

**AFRICA**  
Refinery Production from 2 000 to 2 013  
by region (kt)



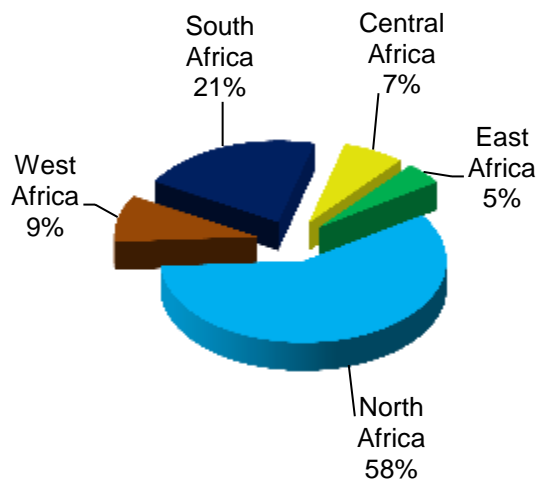
**2 000 and 2 013 Regional Shares of Refinery Production**

**2 000**



69 345 kt

**2 013**



60 570 kt

## Producers, Net Exporters and Net Importers of Oil Products in 2 013

Producers	kt
Algeria	23 122
Egypt	21 822
South Africa	20 846
Libya	7 350
Morocco	6 597
Nigeria	4 516
Sudan	3 787
Côte d'Ivoire	3 245
Angola	2 207
Cameroon	1 791
Tunisia	1 678
Kenya	852
Gabon	843
Niger	784
Senegal	749
Congo	731
Zambia	688
Chad	566
Ghana	424
<b>Africa</b>	<b>102 598</b>

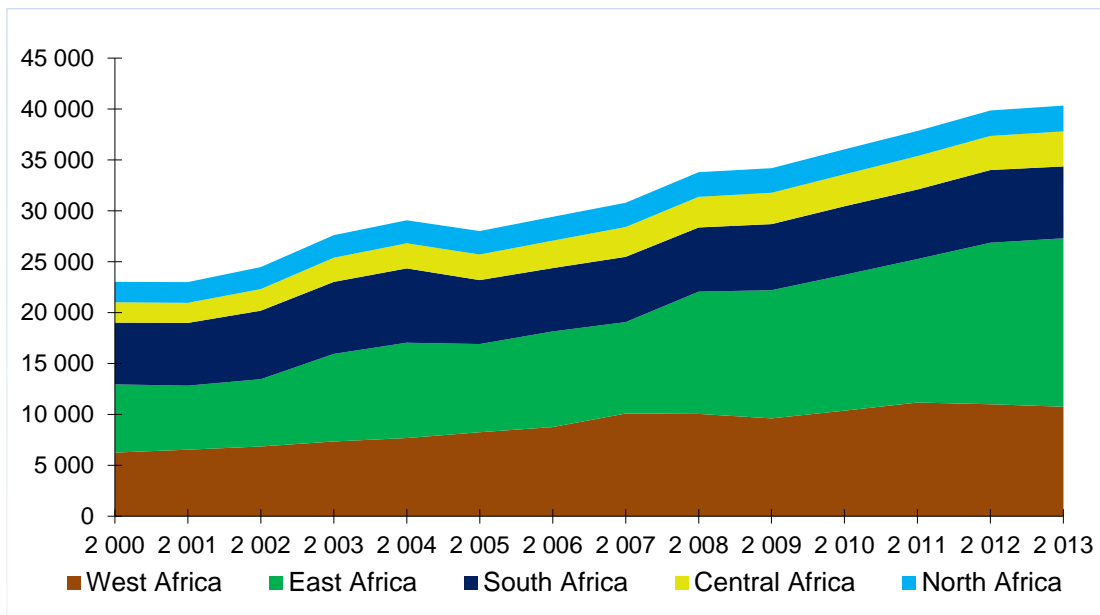
Net exporters	kt
Algeria	7 596
Libya	3 727
Côte d'Ivoire	1 701
Gabon	441
Cameroon	204
Niger	160
Congo	146
<b>Africa</b>	<b>13 975</b>

Net importers	kt
Morocco	7 033
Nigeria	6 914
Egypt	6 179
Tunisia	3 982
South Africa	3 955
Kenya	3 190
Uganda	3 171
Ghana	2 854
Ethiopia	2 554
Tanzania	2 366
Benin	1 797
Mozambique	1 338
Mauritius	1 216
Mali	949
Congo DR	935
Botswana	922
Namibia	880
Sudan	857
Guinea	848
Mauritania	829
Senegal	823
Madagascar	734
Zimbabwe	680
Burkina Faso	674
Togo	651
South Sudan	491
Djibouti	464
Angola	441
Malawi	389
Seychelles	321
Sierra Leone	304
Equatorial Guinea	270
Rwanda	257
Swaziland	232
Cape Verde	195
Zambia	192
Liberia	191
Gambia	176
Lesotho	176
Eritrea	162
Somalia	130
Burundi	84
Saharawi Republic	84
São Tomé & Príncipe	52
Guinea Bissau	47
Comoros	36
Chad	28
Central Africa	27
<b>Africa</b>	<b>61 080</b>

# CHARCOAL PRODUCTION

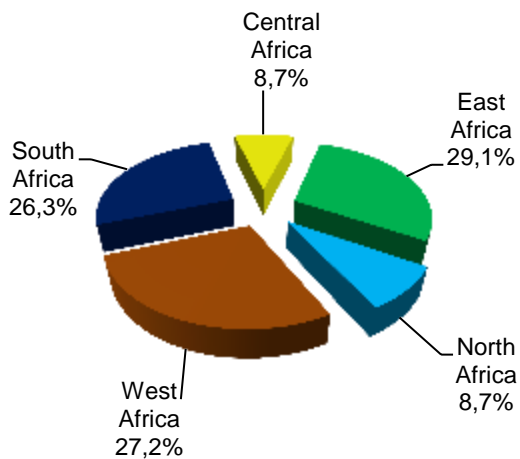
## AFRICA

Charcoal production from 2 000 to 2 013  
by region (kt)



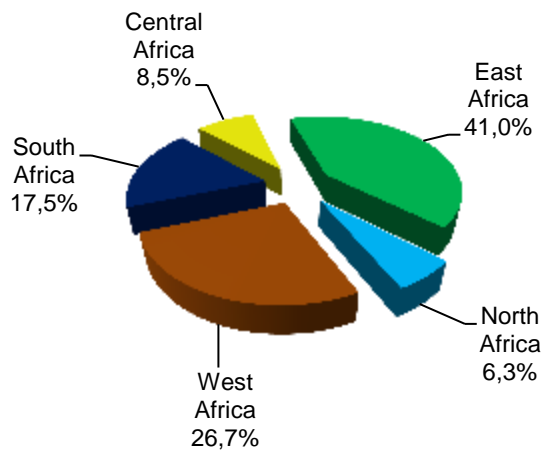
### 2 000 and 2 013 Regional Shares of Charcoal Production

**2 000**



6 697 kt

**2 013**



16 542 kt

## Producers of Charcoal from 2 013

Producers	kt
Ethiopia	6 000
Nigeria	3 744
Congo DR	3 674
Kenya	3 604
Sudan	1 944
Uganda	1 835
Tanzania	1 762
South Africa	1 736
Malawi	1 720
Côte d'Ivoire	1 402
Egypt	1 397
Angola	1 302
Madagascar	1 227
Somalia	1 187
Zambia	1 147
Ghana	1 112
Burkina Faso	796
Mozambique	714
Algeria	711
Togo	653
Senegal	482
Mali	477
Niger	447
Chad	434
Sierra Leone	411
Guinea	372
Benin	268
Liberia	262
Namibia	253
Cameroon	245
Tunisia	204
Mauritania	201
Congo	197
Rwanda	172
Eritrea	149
Morocco	111
Libya	108
Lesotho	99
Guinea Bissau	69
Botswana	68
Gambia	63
Burundi	60
Djibouti	50

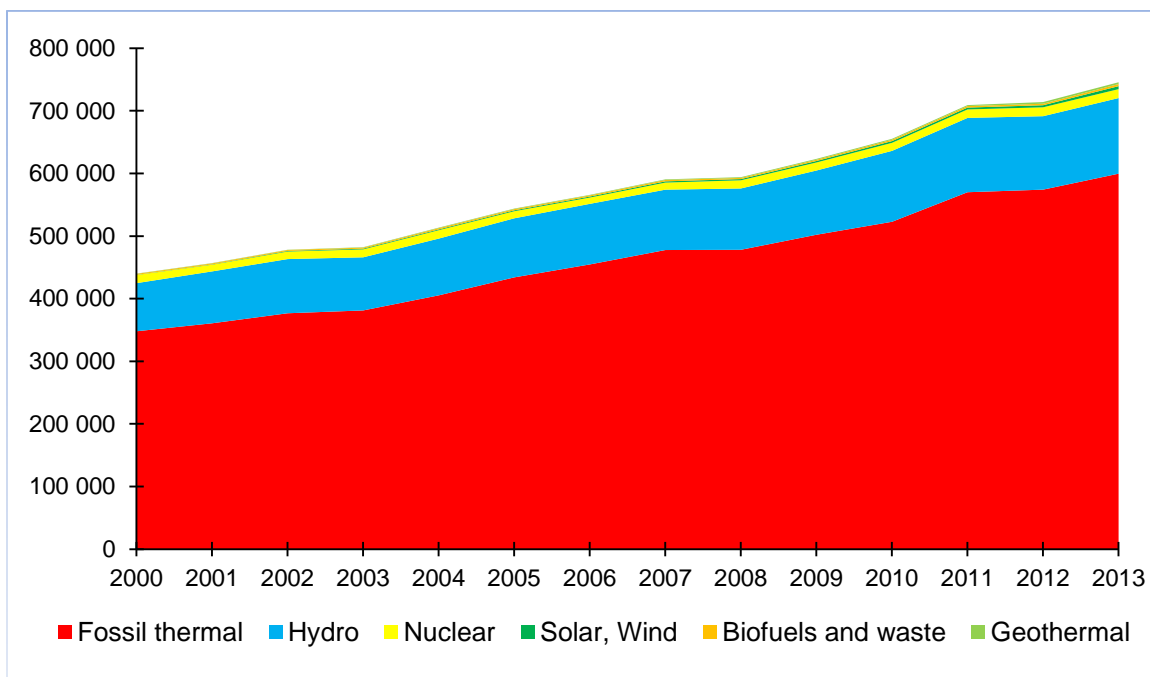
Swaziland	46
Comoros	39
Gabon	21
Central Africa	13
South Sudan	11
Equatorial Guinea	10
São Tome & Principe	9
Zimbabwe	9
Cape Verde	1
Mauritius	1
<b>Africa</b>	<b>43 028</b>



## ELECTRICITY GENERATION BY FUEL

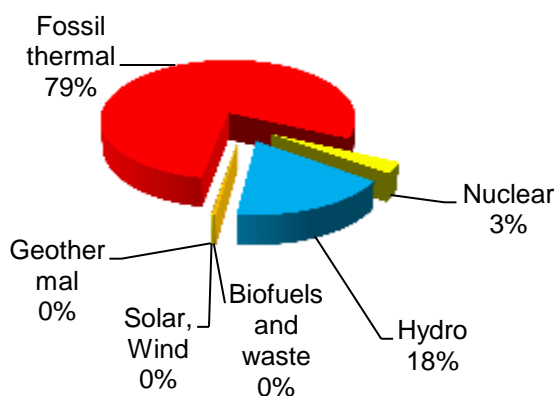
### AFRICA

Electricity Generation from 2 000 to 2 013  
by fuel (GWh)



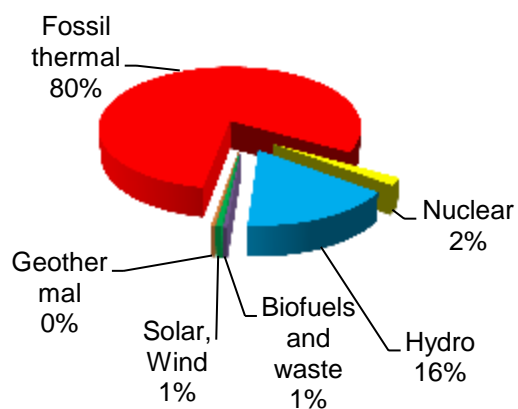
### 2 000 and 2 013 Fuel Shares of Electricity Generation

**2 000**



**347 982 GWh**

**2 013**



**570 678 GWh**

## Electricity Production from Fossil Fuel from 2 013

Nuclear	GWh
South Africa	14 202
<b>Africa</b>	<b>14 202</b>

Solar, wind, Geothermal, Biofuels and waste	GWh
Kenya	3085
South Africa	1650
Egypt	1621
Morocco	1215
Ethiopia	592
Mauritius	500
Tunisia	365
Rwanda	298
Algeria	231
Sudan	211
Uganda	196
Côte d'Ivoire	173
Mozambique	166
Cameroon	127
Tanzania	106
Mali	52
Swaziland	45
Senegal	45
Zimbabwe	40
Mauritania	29
Madagascar	22
Malawi	18
Namibia	14
Gabon	14
Botswana	9
Libya	9
Cape Verde	7
Eritrea	6
Central africa	5
Congo DR	5
Guinea	4
Niger	4
Angola	4
Ghana	3
Zambia	3
<b>Other Africa</b>	<b>10</b>
<b>Africa</b>	<b>10 885</b>

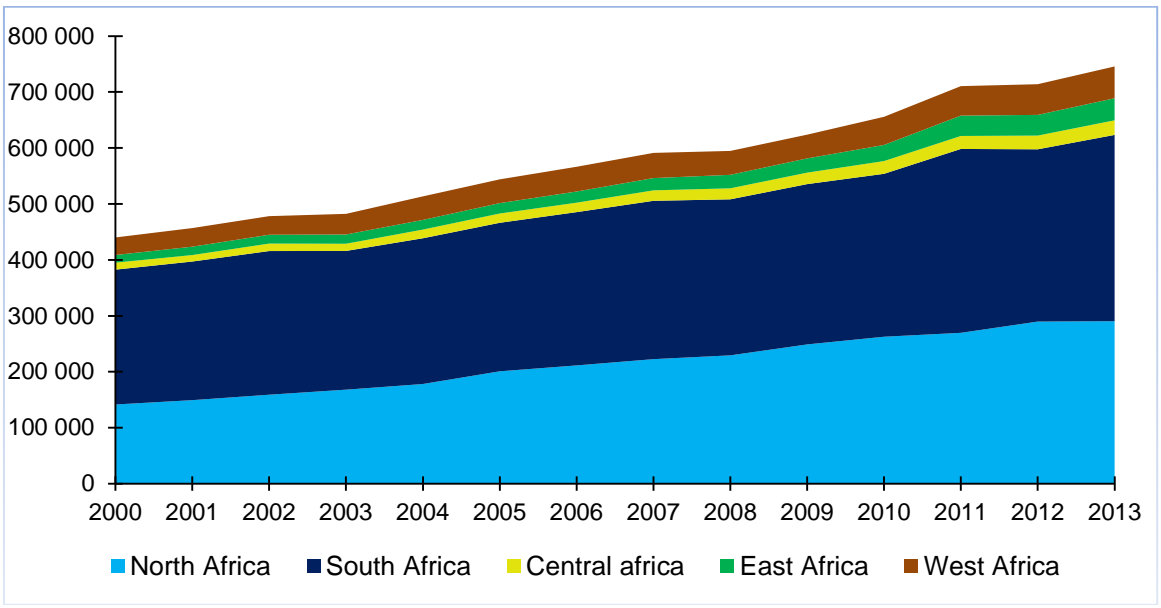
Hydro	GWh
Mozambique	14 542
Egypt	13 840
Zambia	11 134
Ghana	8 377
Sudan	8 233
South Africa	7 884
Congo DR	7 858
Ethiopia	7 306
Zimbabwe	5 844
Nigeria	5 267
Cameroon	4 783
Angola	4 588
Kenya	2 990
Madagascar	2 498
Morocco	2 393
Côte d'Ivoire	2 380
Malawi	1 914
Uganda	1 560
Tanzania	1 323
Namibia	1 082
Gabon	864
Congo	858
Mali	787
Guinea	580
Senegal	385
Lesotho	308
Sierra Leone	287
Swaziland	240
Tunisia	214
Burundi	179
Rwanda	142
Central Africa	138
Algeria	106
Mauritania	99
Mauritius	95
Burkina Faso	95
Togo	60
South Sudan	21
Equatorial Guinea	18
Somalia	11
São Tomé & Príncipe	11
Comoros	5
Benin	1
<b>Africa</b>	<b>121 300</b>

Fossil fuel	GWh
South Africa	260 017
Egypt	142 468
Algeria	55 819
Libya	31 174
Morocco	22 483
Nigeria	19 934
Tunisia	17 944
Côte d'Ivoire	7 016
Ghana	4 635
Tanzania	4 385
Sudan	3 504
Kenya	3 405
Senegal	3 357
Zimbabwe	2 917
Botswana	2 617
Mauritius	2 291
Mali	1 796
Angola	1 778
Cameroon	1 613
Madagascar	1 542
Gabon	1 017
Zambia	781
Burkina Faso	625
Uganda	613
Guinea	598
Ethiopia	564
Congo	543
Niger	448
Seychelles	408
Eritrea	398
Equatorial Guinea	396
Somalia	351
Mauritania	335
Mozambique	318
Cape Verde	290
Chad	269
Rwanda	256
South Sudan	250
Gambia	236
Benin	160
Swaziland	124
Togo	111
Saharawi Republic	90
Djibouti	80
Guinea Bissau	75
Comoros	60
Sierra Léone	45
Malawi	43
Namibia	41
Liberia	40
São Tome & Príncipe	18
Congo DR	9
Burundi	4
Central Africa	1
<b>Africa</b>	<b>600 293</b>

## ELECTRICITY GENERATION BY REGION

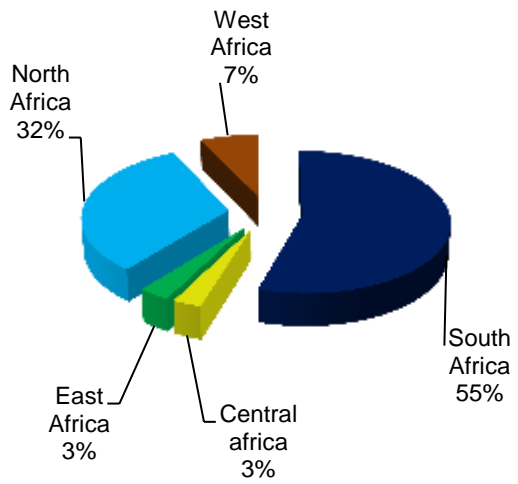
### AFRICA

Electricity Generation from 2 000 to 2 013  
by region (GWh)



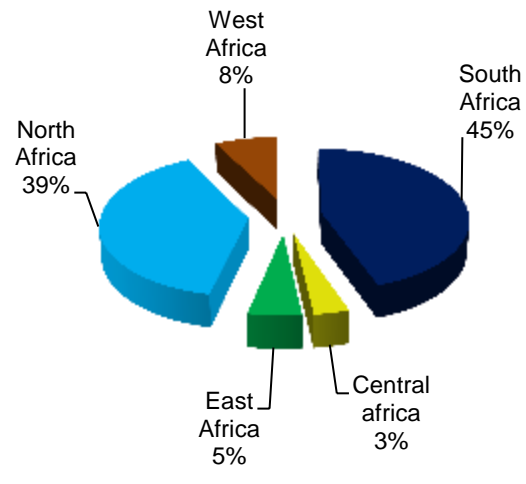
2 000 and 2 013 Regional Shares of Electricity Generation

### 2 000



241 026 GWh

### 2 013



308 870 GWh

## Producers, Net Exporters and Net Imports of Electricity from 2 013

Producers	GWh
South Africa	283 728
Egypt	157 930
Algeria	56 149
Libya	31 183
Morocco	26 689
Nigeria	25 200
Tunisia	18 369
Mozambique	15 026
Ghana	12 871
Zambia	11 917
Sudan	11 599
Côte d'Ivoire	9 102
Kenya	8 989
Zimbabwe	8 800
Ethiopia	8 461
Congo DR	8 391
Cameroon	6 523
Angola	6 370
Tanzania	6 051
Senegal	3 710
Uganda	3 203
Mauritius	2 886
Mali	2 635
Botswana	2 626
Malawi	2 442
Madagascar	2 422
Gabon	2 113
Namibia	1 496
Congo	1 407
Guinea	1 183
Rwanda	769
Burkina Faso	731
Mauritania	505
Niger	452
Equatorial Guinea	413
Seychelles	409
Swaziland	408
Eritrea	404
Lesotho	385
Somalia	362
Sierra Leone	332
Cape Verde	297
South Sudan	271
Chad	269
Gambia	238
Togo	208
Burundi	184
Benin	162
Central Africa	144
Saharawi Republic	90
Djibouti	82
Guinea Bissau	75
Comoros	66
Liberia	40
São Tome & Príncipe	28
<b>Africa</b>	<b>746 797</b>

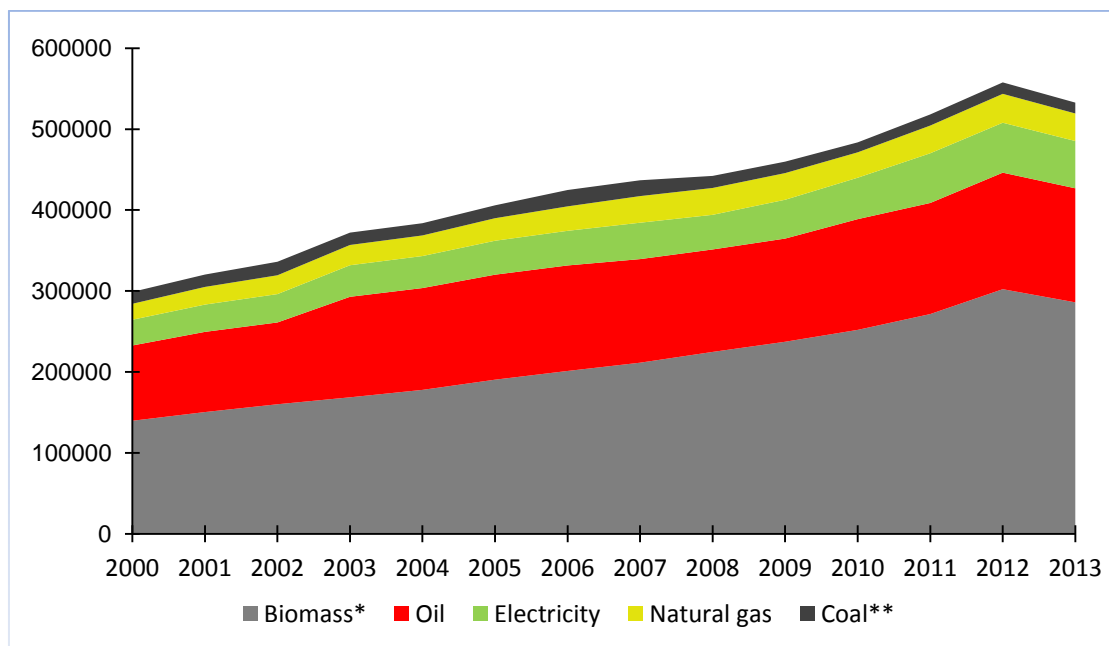
Net importers	GWh
Morocco	4 911
Botswana	3 545
Namibia	2 185
Benin	988
Swaziland	822
Togo	659
Niger	599
Zimbabwe	539
Burkina Faso	532
Mali	360
Senegal	283
Lesotho	225
Burundi	92
Rwanda	90
Tanzania	60
Libya	46
Congo	37
Kenya	11
<b>Africa</b>	<b>15 984</b>

Net exporters	GWh
South Africa	5 334
Côte d'Ivoire	820
Mozambique	719
Zambia	559
Ghana	503
Egypt	390
Ethiopia	384
Uganda	103
Algeria	89
Tunisia	57
Congo DR	8
<b>Africa</b>	<b>8 965</b>

## TOTAL FINAL CONSUMPTION BY FUEL

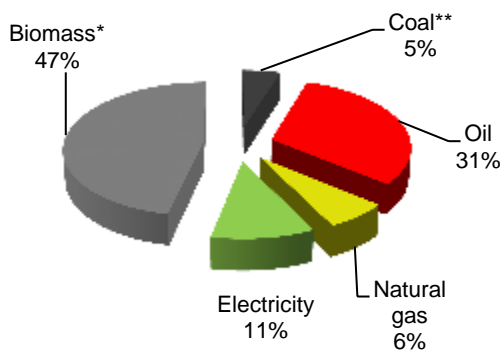
### AFRICA

Total final consumption from 2 000 to 2 013  
by fuel (ktoe)



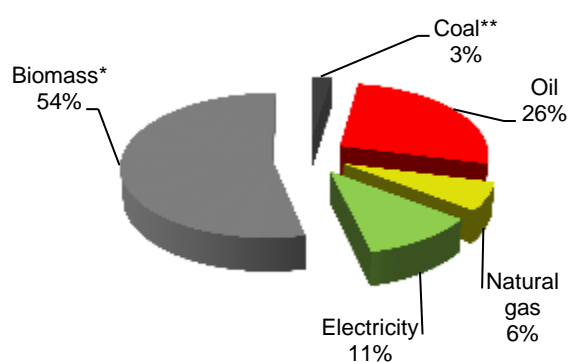
### 2 000 and 2 013 Fuel Shares of Total Final Consumption

2 000



139 660 ktoe

2 013



285 978 ktoe

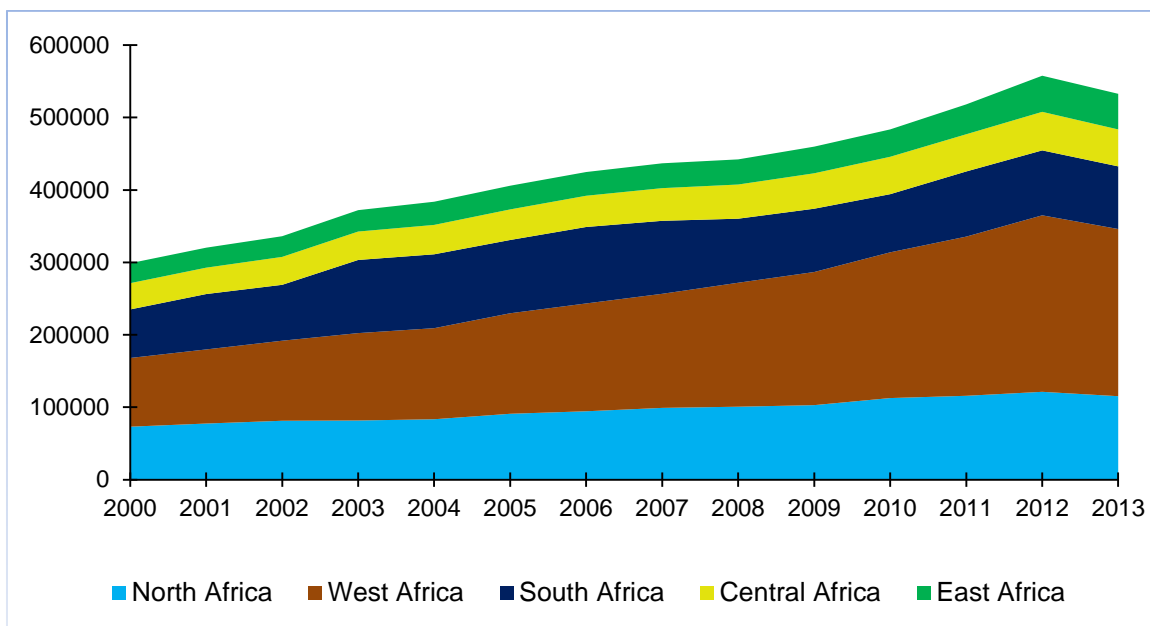
\* includes firewood and charcoal

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

### TOTAL FINAL CONSUMPTION BY REGION

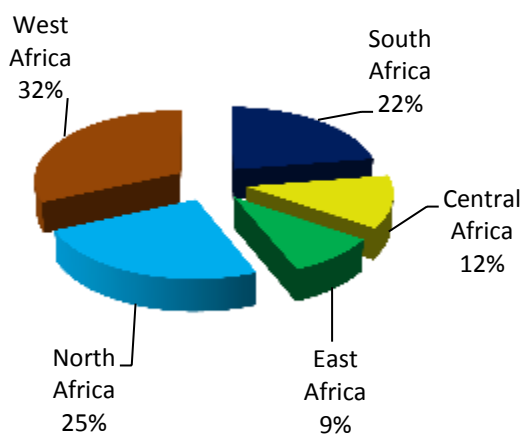
#### AFRICA

Total final consumption from 2 000 to 2 013  
by region (ktoe)



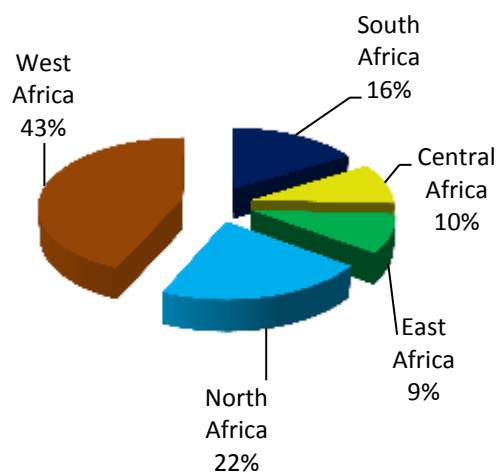
#### 2 000 and 2 013 Regional Shares of Total Final Consumption

2 000



94 881 ktoe

2 013

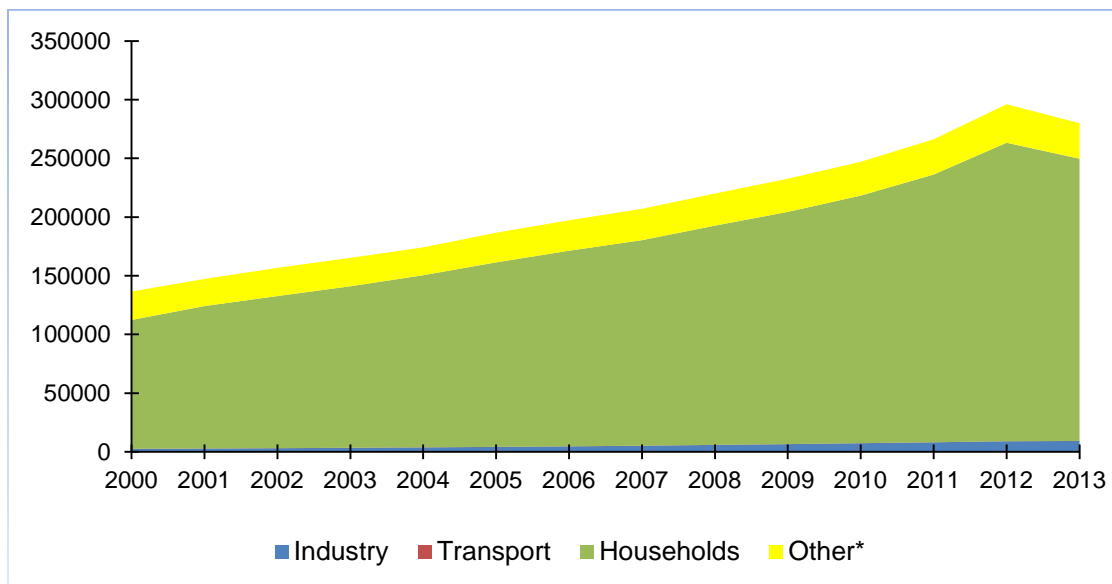


230 834 ktoe

## TOTAL FINAL CONSUMPTION BY SECTOR

### Firewood

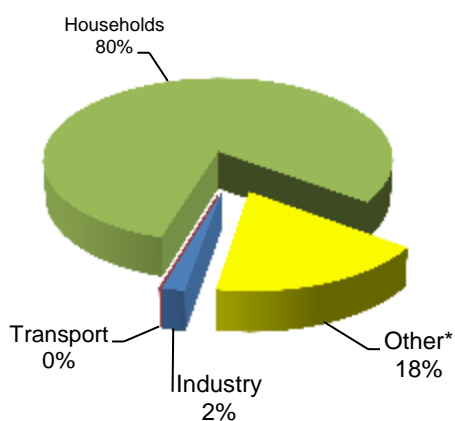
Total Final Consumption from 2 000 to 2 013  
by sector (ktoe)



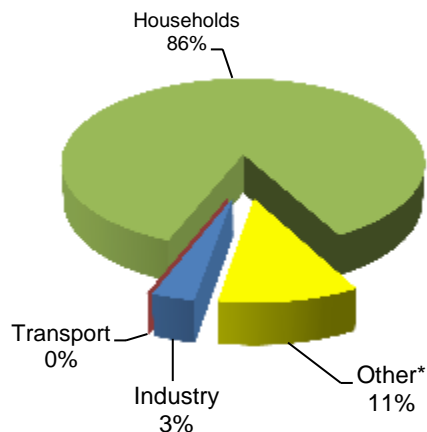
### 2 000 and 2 013 shares of Africa firewood consumption

**2 000**

**2 013**



**109 812 ktoe**

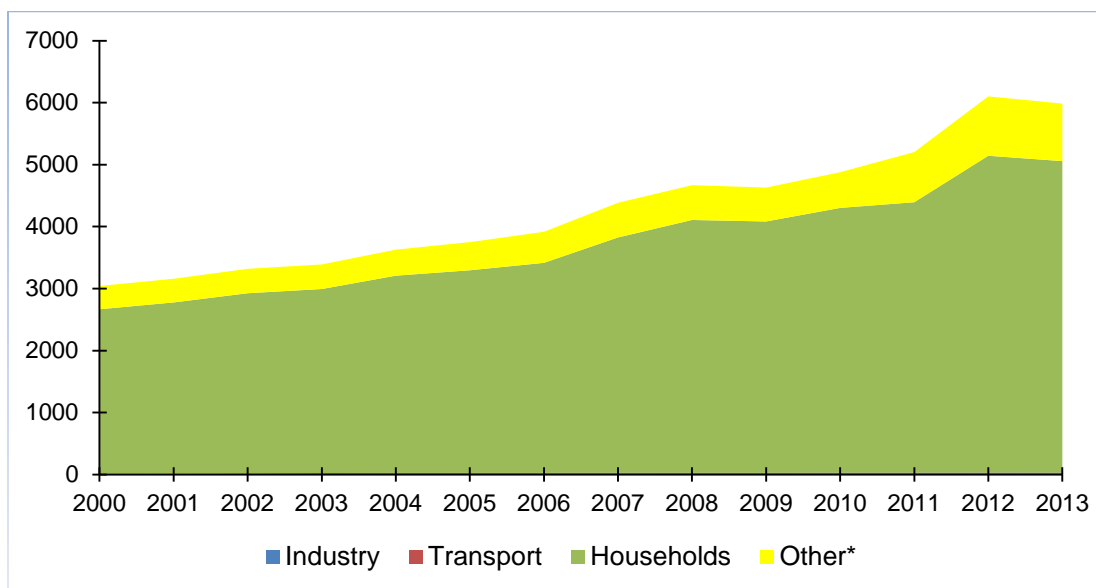


**240 465 ktoe**

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

# Charcoal

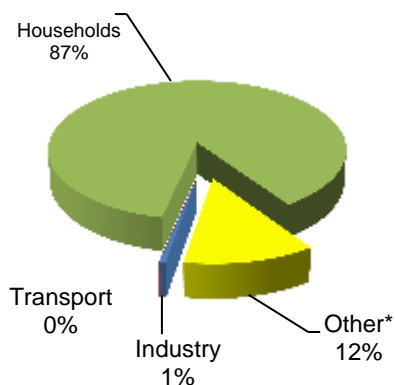
### Total Final Consumption from 2 000 to 2 013 by sector (ktoe)



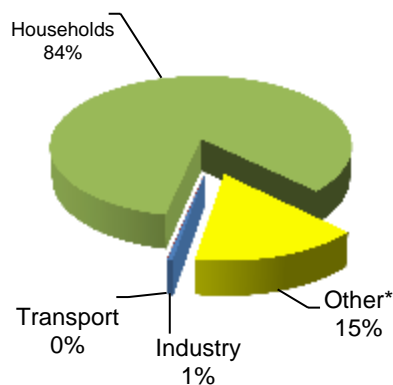
### 2 000 and 2 013 shares of Africa charcoal consumption

## 2 000

## 2 013



**2 650 ktoe**



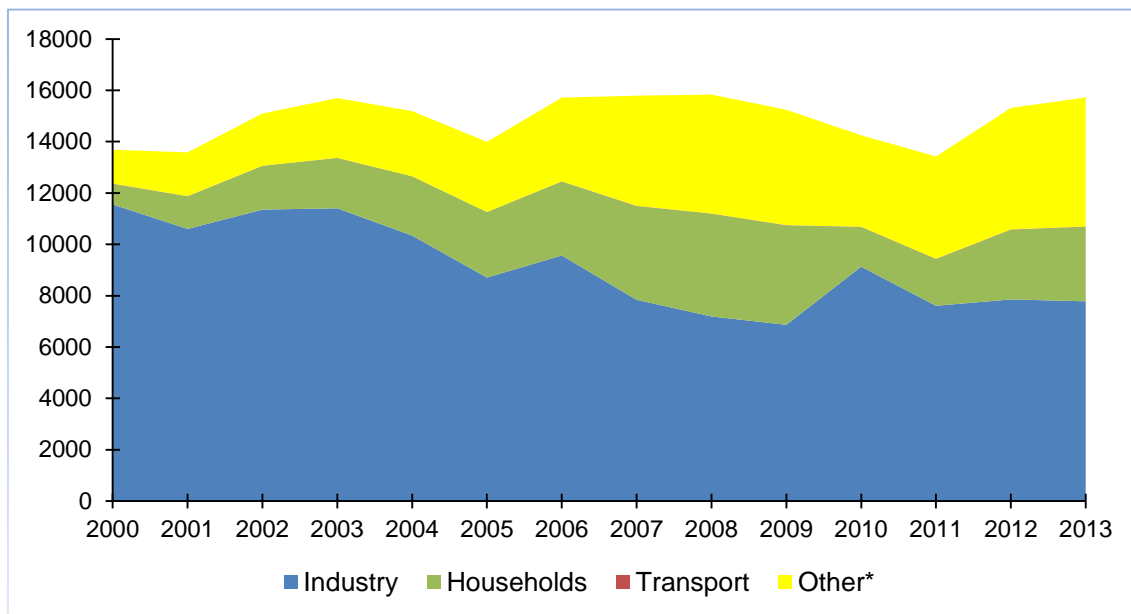
**5 027 ktoe**

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



## Coal\*\*

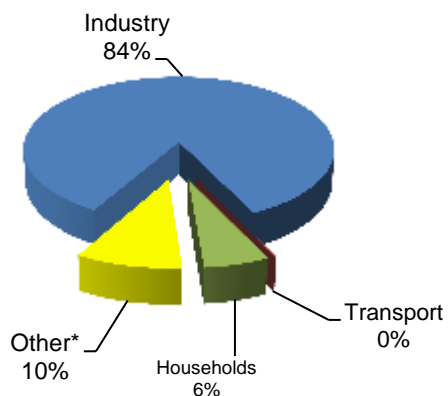
**Total Final Consumption from 2 000 to 2 013  
by sector (ktoe)**



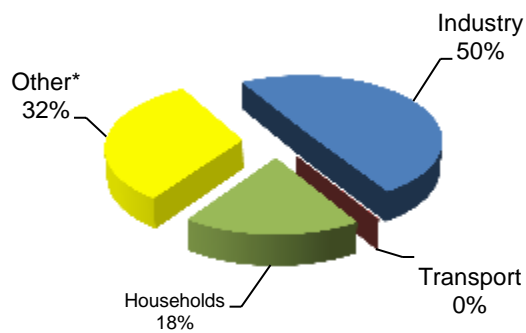
**2 000 and 2 013 shares of Africa coal\*\* consumption**

**2 000**

**2 013**



**11 555 ktoe**



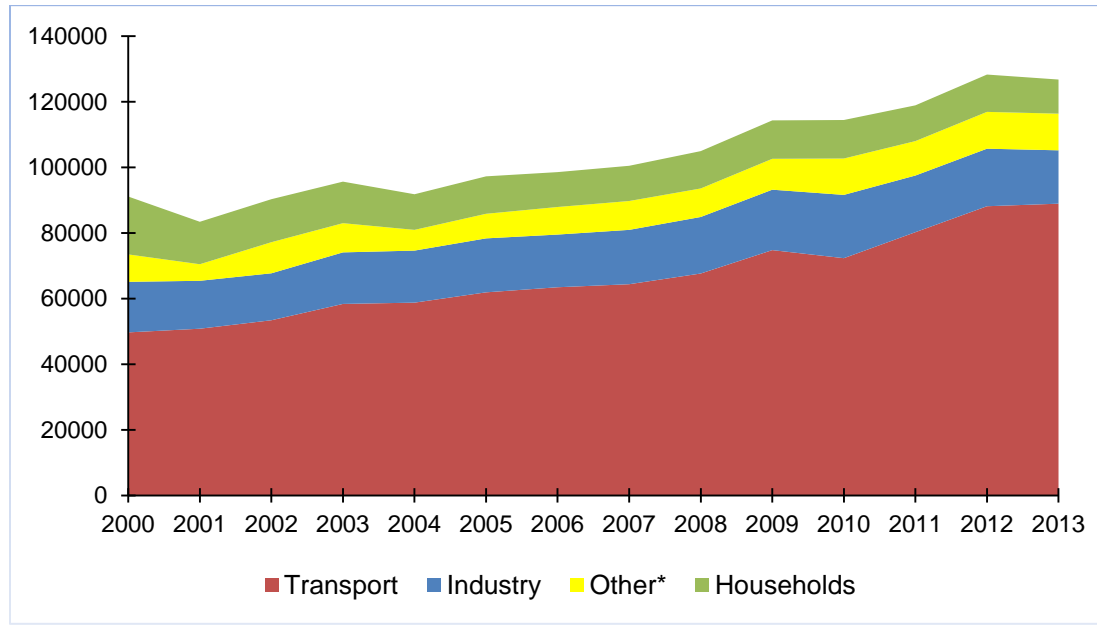
**7 782 ktoe**

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

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

# Oil

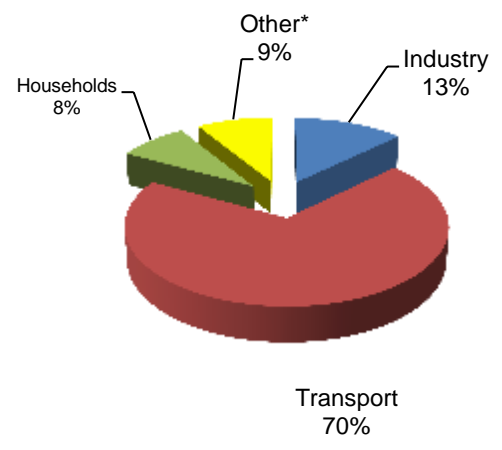
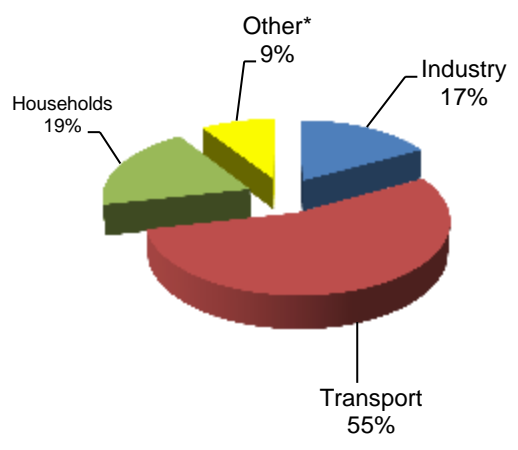
**Total Final Consumption from 2 000 to 2 013  
by sector (ktoe)**



**2 000 and 2 013 Shares of Africa Oil Consumption**

**2 000**

**2 013**



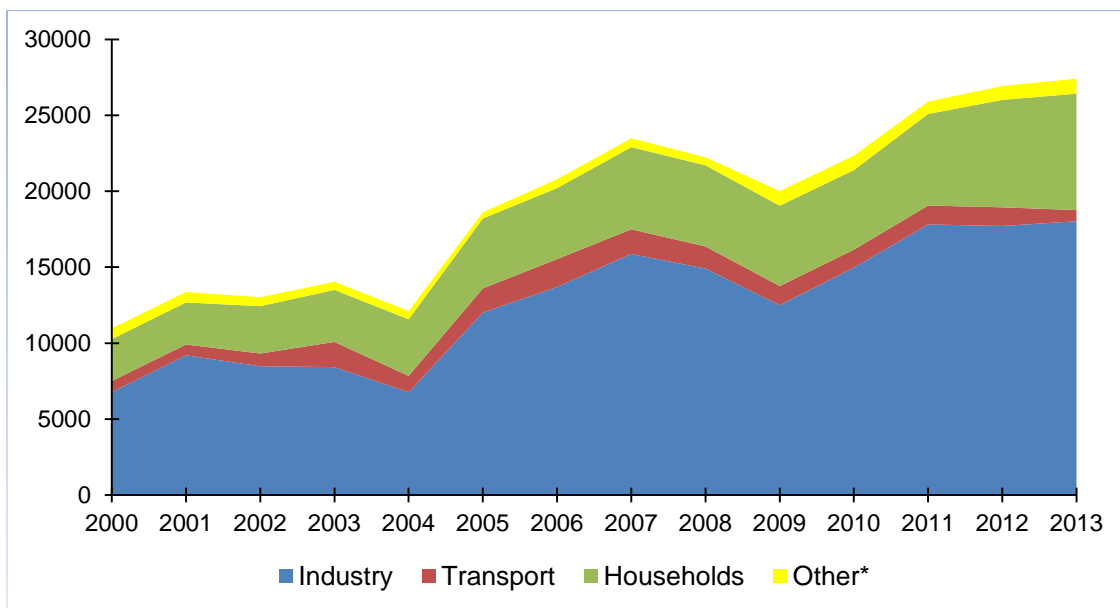
**49 699 ktoe**

**88 942 ktoe**

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

## Natural gas

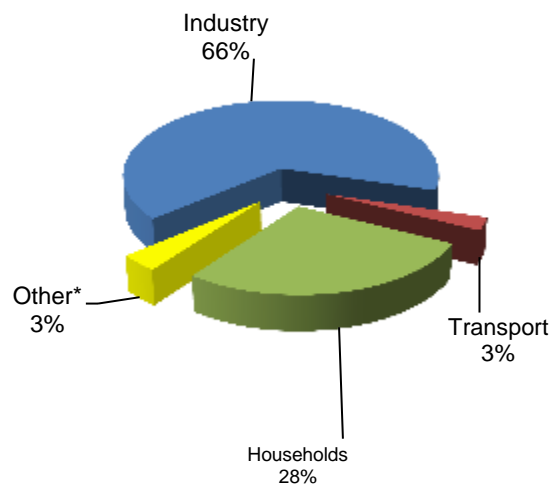
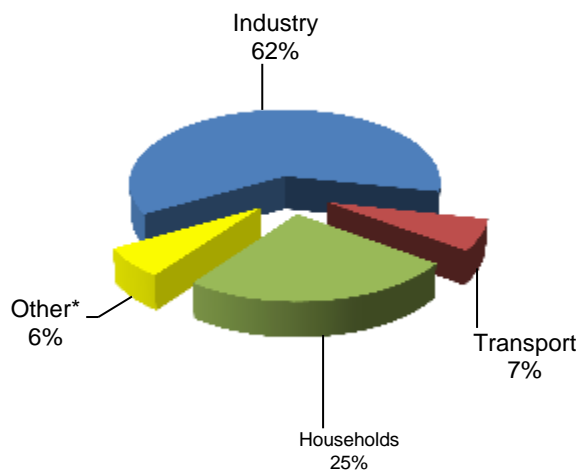
**Total Final Consumption from 2 000 to 2 013  
by sector (ktoe)**



**2 000 and 2 013 Shares of Africa Natural Gas Consumption**

**2 000**

**2 013**



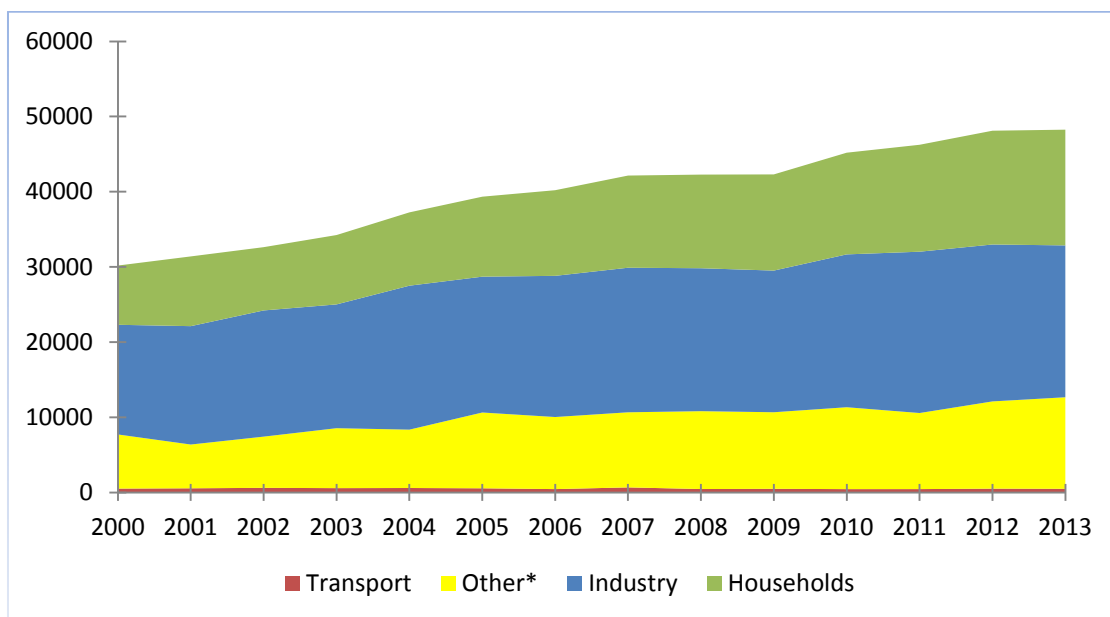
**6 373 ktoe**

**18 026 ktoe**

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

# Electricity

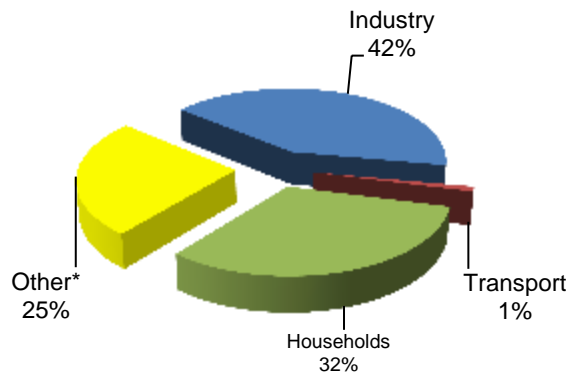
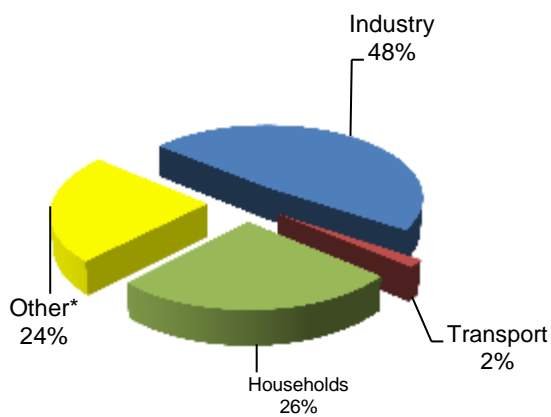
Total Final Consumption from 2 000 to 2 013  
by sector (ktoe)



2 000 and 2 013 shares of Africa electricity consumption

2 000

2 013



14 585 ktoe

20 195 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	356 367	0	116 021	114 822	3 390	6 607	394	274 756	0	872 357
	Imports	31 549	27 002	3 926	6912	0	0	0	0	1 162	70 550
	Exports	-270 377	-40 488	-38 798	-78 983	0	0	0	0	-1 124	-429 769
	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	-1 457	728	931	0	0	0	0	0	0	202
	<b>TPES</b>	<b>116 081</b>	<b>-12 758</b>	<b>82 081</b>	<b>42 752</b>	<b>3 390</b>	<b>6 607</b>	<b>394</b>	<b>274 756</b>	<b>38</b>	<b>513 340</b>
	Transfers	0	0	0	0	0	0	0	0	0	0
	Statistical diff.	71	-193	-84	-748	0	0	0	29 639	676	29 360
TRANSFORMATION	<b>Transformation</b>	<b>-114 906</b>	<b>115 366</b>	<b>-67 268</b>	<b>-21 983</b>	<b>-3 390</b>	<b>-6 607</b>	<b>-394</b>	<b>-161 083</b>	<b>37 840</b>	<b>-222 425</b>
	Electricity Producers	-233	-12 429	-67 268	-21 983	-3 390	-6 607	-394	-1 391	37 840	-75 856
	Petroleum Refineries	-114 672	127 795	0	0	0	0	0	0	0	13 123
	Charcoal Plants	0	0	0	0	0	0	0	-159 693	0	-159 693
	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
	Blast Furnaces	0	0	0	0	0	0	0	0	0	0
	Other Transf.	0	0	0	0	0	0	0	0	0	0
	<b>Energy Ind. Own Use</b>	<b>-434</b>	<b>-1 976</b>	<b>-28</b>	<b>-9 994</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-3 726</b>	<b>-16 158</b>
	<b>Losses</b>	<b>-756</b>	<b>0</b>	<b>0</b>	<b>-143</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-4 643</b>	<b>-5 542</b>
FINAL CONSUMPTION	<b>TFC</b>	<b>56</b>	<b>100 439</b>	<b>14 701</b>	<b>9 884</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>143 311</b>	<b>30 186</b>	<b>298 576</b>
	Industry	56	16 989	11 555	6 095	0	0	0	2 584	14 585	51 864
	Transport	0	54 778	10	663	0	0	0	0	522	55 972
	Households	0	19 454	805	2 484	0	0	0	115 641	7 883	146 267
	Com. & Public	0	1 039	568	41	0	0	0	0	3 810	5 458
	Agriculture/Forestry	0	3 337	0	0	0	0	0	0	0	3 337
	Others (Non Specified)	0	4 835	750	600	0	0	0	25 086	3 386	34 658
	Non-Energy Use	0	6	1014	0	0	0	0	0	0	1 019

## SIMPLIFIED ENERGY BALANCE TABLE

## AFRICA

2013

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	392 688	0	137 919	156 113	3 700	10 430	2 880	318 935	0	1 022 667
	Imports	32 923	69 005	4 078	6 365	0	0	0	0	1 374	113 745
	Exports	-294 924	-15 788	-38 768	-68 835	0	0	0	0	-771	-419 086
	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	-327	-293	-901	-364	0	0	0	0	0	-1 884
	<b>TPES</b>	<b>130 361</b>	<b>52 924</b>	<b>102 327</b>	<b>93 279</b>	<b>3 700</b>	<b>10 430</b>	<b>2 880</b>	<b>318 935</b>	<b>604</b>	<b>715 441</b>
	Transfers	0	0	0	0	0	0	0	0	0	0
	Statistical diff.	978	2 308	-1 246	-495	0	0	0	64 590	-872	65 264
TRANSFORMATION	<b>Transformation</b>	<b>-128 876</b>	<b>94 735</b>	<b>-82 795</b>	<b>-60 824</b>	<b>-3 700</b>	<b>-10 430</b>	<b>-2 880</b>	<b>-134 644</b>	<b>64 203</b>	<b>-265 212</b>
	Electricity Producers	-934	-21 174	-64 883	-50 552	-3 700	-10 430	-2 880	0	64 203	-90 350
	Petroleum Refineries	-127 943	115 909	0	0	0	0	0	0	0	-12 034
	Charcoal Plants	0	0	0	0	0	0	0	-134 644	0	-134 644
	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
	Blast Furnaces	0	0	0	0	0	0	0	0	0	0
	Other Transf.	0	0	-17 912	-10 272	0	0	0	0	0	0
<b>Energy Ind. Own Use</b>	<b>-1 688</b>	<b>-9 013</b>	<b>-4 598</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-7 749</b>	<b>-23 048</b>
<b>Losses</b>	<b>-654</b>	<b>-59</b>	<b>-5</b>	<b>-555</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-7 603</b>	<b>-8 875</b>
FINAL CONSUMPTION	<b>TFC</b>	<b>121</b>	<b>140 895</b>	<b>13 684</b>	<b>31 405</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>248 882</b>	<b>48 582</b>	<b>483 570</b>
	Industry	121	17 999	7 787	16 223	0	0	0	9 339	20 158	71 628
	Transport	0	98 099	13	661	0	0	0	0	493	99 266
	Households	0	11 500	2 900	6 895	0	0	0	189 546	15 472	226 314
	Com. & Public	0	2 259	1 642	168	0	0	0	0	10 049	14 118
	Agriculture/Forestry	0	3 954	1 021	46	0	0	0	0	2 167	7 189
	Others (Non Specified)	0	4 525	321	16	0	0	0	49 997	243	55 102
	Non-Energy Use	0	2 559	0	7 394	0	0	0	0	0	9 953

## CONVERSION FACTORS

(Source: IEA)

### General Conversion Factors for Energy

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

### Conversion Factors for Mass

To:	kg	t	lt	st	lb
From:	Multiply by :				
kilogramme (kg)	1	0.001	$9.84 \times 10^{-4}$	$1.102 \times 10^{-3}$	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	$4.54 \times 10^{-4}$	$4.46 \times 10^{-4}$	$5.0 \times 10^{-4}$	1

### Conversion Factors for Volume

To:	gal U.S.	gal U.K.	bbl	Ft <sup>3</sup>	l	m <sup>3</sup>
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 <sup>3</sup> )	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 <sup>3</sup> )	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 plan basis. However, if data are not available on a unit basis, the convention for defining a CHP plan 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.