



مركز الإحصاء - أبوظبي
STATISTICS CENTRE - ABU DHABI



Energy & Environment Statistics 2011

Issued in November 2012

Table of content

Introduction	2
Water and electricity statistics	3
Electricity generation	3
Fuel consumption of the water and electricity activity	4
Electricity generated by solar energy	5
Electricity consumption	6
Production of desalinated water	7
Consumption of desalinated water	7
Carbon dioxide emissions	10
Air pollutant total emissions	11
Occupational health and safety	12
Oil and gas statistics	13
Crude oil production and exports	13
Crude oil prices	14
Petroleum products	14
Natural gas	17
Petrochemical products	18
Carbon dioxide emissions	19
Air pollutant total emissions	20
Occupational health and safety	21
Explanatory Notes	22
Glossary	22
Data sources	22
Abbreviations used.....	23
Notes on tables.....	23
More information and next release.....	23
References.....	23

Introduction

This report presents statistics on energy and environment in the Emirate of Abu Dhabi for the year 2011, comprising statistics of water and electricity production sector and oil and gas sector. The main sources for these statistics are Abu Dhabi National Oil Company – ADNOC, Abu Dhabi Water and Electricity Authority – ADWEA, Abu Dhabi Future Energy Company – Masdar, Abu Dhabi Water and Electricity Company, Abu Dhabi Distribution Company, Al Ain Distribution Company and TAKREER.

The Explanatory Notes section at the end of this report provides an explanation of the key terms and technical concepts used in the compilation of energy and environment statistics. Readers are encouraged to refer to that section in conjunction with reading the statistics and information outlined in the report.

Water and electricity statistics

Water and electricity production sector has a great significance among the various economic sectors, given its big role in the provision of basic services that are necessary for Citizens, Non-Citizens and other economic activities, and therefore the Emirate of Abu Dhabi pays attention to the development of this sector.

“Water and Electricity” sector saw a remarkable growth after establishing the Abu Dhabi Water and Electricity Authority (ADWEA) in March 1998, a public supervisory body responsible for implementing government policy regarding water and electricity sector in the Emirate.

(ADWEA) is serving about 2.1 million people in the Emirate of Abu Dhabi, living over approximately 67,340 square kilometers, equivalent to 87 per cent of the total area of the United Arab Emirates. In 2011, the total electricity production for the Emirate of Abu Dhabi, except Fujairah stations, was equivalent to 10,875 MW, while the total capacity of water desalination was approximately 683 million gallons per day.

Electricity generation

In 2011, the total electricity production by companies was 46,367 GWH in 2011, an increase of 82 per cent during the whole period since 2005, of which about 3,116 GWH being transferred to Northern Emirates, as shown in table (1.1). Electricity consumption in Abu Dhabi Emirate also increased by 70 per cent during the aforesaid period reaching a total consumption of 43,250.9 GWH in 2011, including internal electrical consumption by power stations and technical losses through the network.

Table 1.1: Electrical power statistics

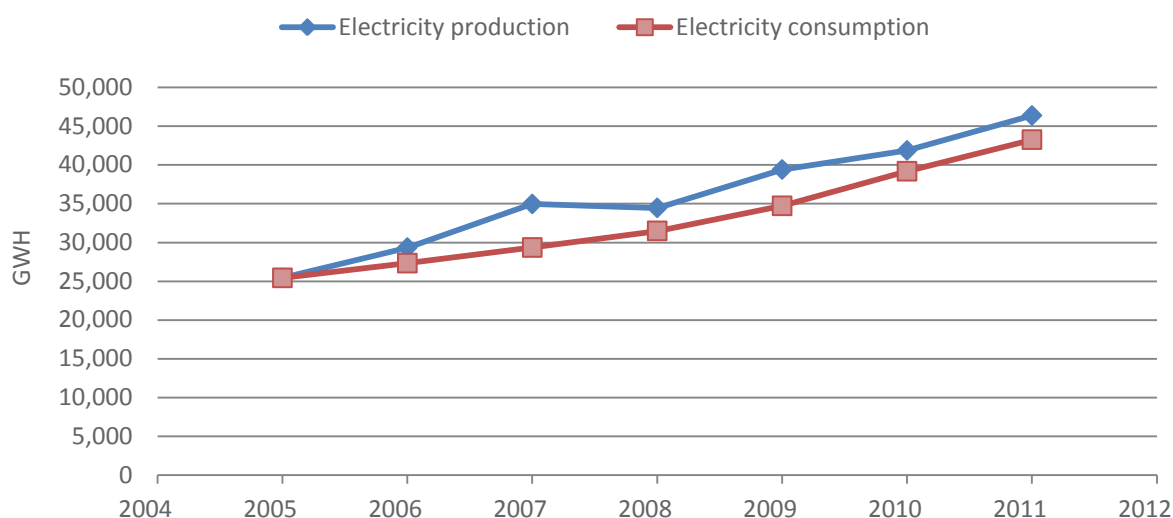
MWH

Item	2005	2006	2007	2008	2009	2010	2011
Total electricity production by companies	25,423,723	28,502,420	34,142,472	34,452,127	39,219,090	41,712,189	46,314,248
Net electricity transferred from EMAL & TAKREER	139	835,371	814,616	na	182,934	146,594	52,655
Total	25,423,862	29,337,791	34,957,088	34,452,127	39,402,024	41,858,783	46,366,903
Electricity exports to northern emirates	na	2,014,773	5,614,875	2,974,627	4,685,857	2,685,643	3,115,984
Electricity consumption in the emirate of AD *	25,423,862	27,323,017	29,342,214	31,480,854	34,716,166	39,173,140	43,250,919
Electrical consumption per capita	18.50	18.7	18.64	18.56	19.01	19.91	20.39
Electricity planned capacity (MW)	7,242	7,671	8,057	8,994	9,249	9,247	10,875

Source: Abu Dhabi Water and Electricity Company

*Consumption includes internal electrical consumption by power stations & technical losses through the network

Figure (1): Total Electricity power production



Source: Abu Dhabi Water and Electricity Company

*Consumption includes internal electrical consumption by power stations & technical losses through the network

Fuel consumption of the water and electricity activity

The demand for electricity and water production increases due to population and economic growth, leading to more fuel burn that is associated with the production of electricity. Power plants use different types of fuel to generate electricity, such as natural gas, crude oil, gas oil (diesel), and fuel oil. Due to economic and environmental considerations, natural gas is the main fuel used in power generation in the Emirate of Abu Dhabi, constituting 96 per cent on average of the total fuel types used in the period from 2005 to 2011. In 2011, total fuel consumption in power plants increased by 8.2 per cent, reaching a total of 543,643 Billion BTU, as shown in table (1.2).

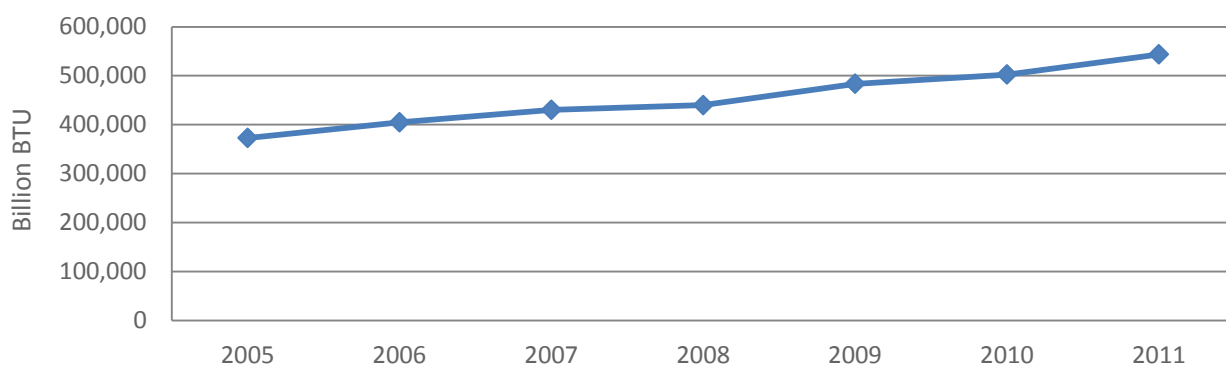
Table 1.2: Fuel Consumption of the water and electricity activity

Billion BTU

Item	2005	2006	2007	2008	2009	2010	2011
Total	372,818	404,742	430,237	439,811	483,597	502,487	543,643
Natural gas	370,973	360,039	414,062	438,757	469,726	467,126	528,114
Crude oil	1,287	26,722	10,737	78	7,783	21,918	6,062
Gas oil	557	11,841	3,003	894	5,239	13,438	9,467
Fuel oil	1	6140	2435	82	849	4	0

Source: Abu Dhabi Water and Electricity Company

Figure (2): Fuel Consumption of the water and electricity activity



Source: Abu Dhabi Water and Electricity Company

Electricity generated by solar energy

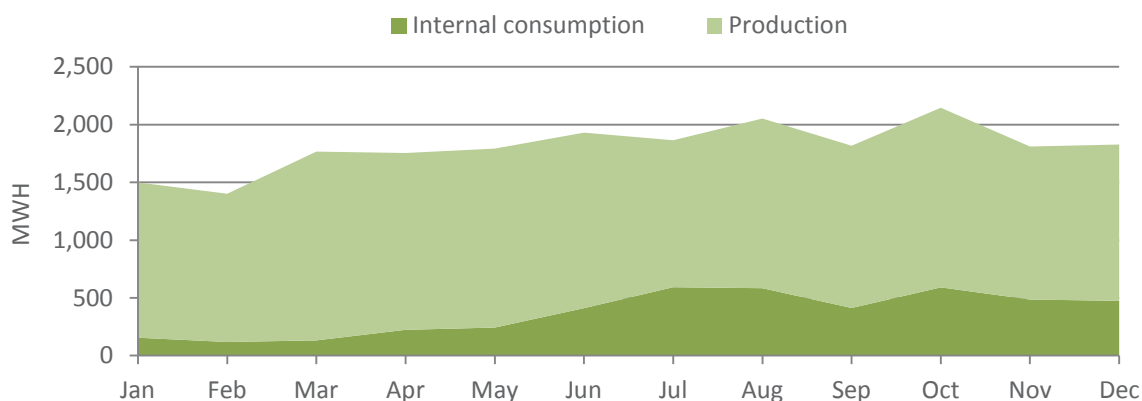
By the end of 2010, electricity production from solar energy reached about 17,239 MWH out of which 74 per cent was transmitted to the distribution network in Abu Dhabi Emirate and 26 per cent was consumed internally by Masdar city.

Table 1.3. Electricity Generation and Consumption from Solar Energy

MWH	
Item	2010
Electricity production	17,239
Electricity internal consumption	4,411
Electricity transferred to distribution network	12,828

Source: Abu Dhabi Future Energy Company - Masdar

Figure (3): Production and internal consumption of solar energy plants - 2010



Source: Abu Dhabi Future Energy Company - Masdar

Electricity consumption

The data presented in the table (1.4) shows that electricity consumption in Abu Dhabi Emirate reached 43,250 GHW in 2011. Abu Dhabi region consumed the largest share (62 per cent), followed by Al Ain (22 per cent) and Al Gharbia (16 per cent).

The household sector consumed 30 per cent of the total, as shown in table (1.5), followed by commercial sector and government sector. It is worth mentioning that some large industrial facilities have their own power plants. TAKREER, Emal and some oil production companies, for example, have their own power plants.

Table 1.4: Electricity consumption by region

MWH

Region	2005	2006	2007	2008	2009	2010	2011
Total consumption*	25,423,862	27,323,017	29,342,214	31,480,854	34,716,166	39,173,140	43,250,919
Abu Dhabi	6,158,411	17,376,073	18,577,267	19,803,499	22,062,262	24,850,010	26,897,768
Al Ain	6,849,131	7,091,412	7,528,700	7,881,926	8,474,342	9,081,380	7,011,402
Al Gharbia	2,416,320	2,855,532	3,236,247	3,795,429	4,179,562	5,241,750	9,341,749

Source: Abu Dhabi Distribution Company and Al Ain Distribution Company

*Consumption includes internal electrical consumption by power stations and technical losses through the network

Table 1.5: Percentage of electricity consumption by sector

%

Sector	2008	2009	2010	2011
Total	100	100	100	100
Domestic Sector	39.6	37.7	35.9	30.7
Commercial	30.8	31.7	32.1	28.8
Government	16.9	16.2	16.1	25.1*
Agriculture	9.1	9.2	8.2	7.0
Industry	2.4	3.7	7.2	8.0
Other Sectors	1.2	1.4	0.6	0.4

Source: Abu Dhabi Distribution Company, Al Ain Distribution Company

*Note: New meters were installed from 2008 and the cumulative reading of those meter were billed in 2011 for Al Garbia (Al Marfa)

Table 1.6: Percentage of electricity consumption by region and sector - 2011
%

Sector	Abu Dhabi	Al Ain	Al Gharbia
Domestic Sector	63.6	30.7	5.7
Commercial	83.0	13.7	3.2
Government	36.6	15.5	47.8*
Agriculture	6.0	69.4	24.6
Industry	76.4	4.9	18.7
Other Sectors	75.7	6.9	17.5

Source: Abu Dhabi Distribution Company, Al Ain Distribution Company

*Note: New meters were installed from 2008 and the cumulative reading of those meter were billed in 2011 for Al Garbia (Al Marfa)

Production of desalinated water

Table (1.7) shows the growth in the production of desalinated water in Abu Dhabi Emirate which reached 999.2 MCM in 2011, an increase of 34.6 per cent compared with 2005, and an increase of 3.8 per cent compared with 2010.

Table 1.7: Production of desalinated water

Million cubic meters

Item	2005	2006	2007	2008	2009	2010	2011
Total of available desalinated water	742.1	802.2	853.3	903.1	961.3	962.8	999.2
Production	636.9	670.5	719.4	784.5	845.4	834.5	854.6
Supply from Al - Fujairah station	105.2	131.7	133.9	118.6	115.9	128.3	144.6

Source: Abu Dhabi Water and Electricity Company

Consumption of desalinated water

Table (1.8) shows the annual consumption of desalinated water in Abu Dhabi Emirate reaching about 961.5 MCM in 2011, with a daily average consumption of 2.63 MCM and a daily per capita average consumption of 1.25 cubic metres. By region, Abu Dhabi region came first consuming about 61 per cent of the total water consumed followed by Al Ain and Al Gharbia regions with 28 and 11.2 per cent respectively.

Table 1.8: Consumption of desalinated water

Million cubic meters

Year	Annual consumption	Average daily consumption
2000	340.38	0.93
2001	414.09	1.13
2002	462.70	1.27
2003	510.79	1.40
2004	583.70	1.59
2005	667.03	1.83
2006	722.14	1.98
2007	756.65	2.07
2008	773.75	2.11
2009	790.02	2.16
2010	872.98	2.39
2011	961.54	2.63

Source: Abu Dhabi Water and Electricity Company, Statistics Centre - Abu Dhabi

Table 1.9: Percentage of desalinated water consumption by region sector - 2011

%

Sector	Abu Dhabi	Al Ain	Al Gharbia
Domestic Sector	60.8	28	11.2
Commercial	83.4	8.1	8.6
Government	49.4	28.9	21.8
Agriculture	36.3	60.7	3.0
Industry	87	2.8	10.2
Other Sectors	83.5	14.6	2.0

Source: Abu Dhabi Distribution Company, Al Ain Distribution Company

Table 1.10: Consumption of desalinated water by region

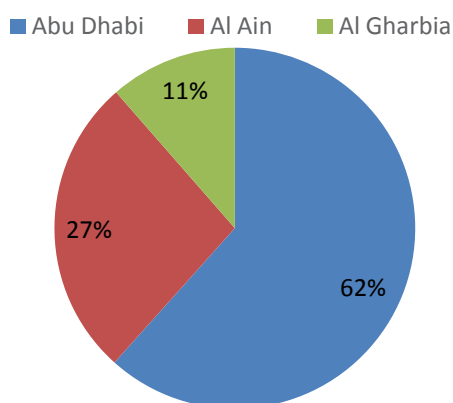
Million cubic meters

Region	2005	2006	2007	2008	2009	2010	2011*
Total consumption	667.0	722.1	756.7	773.8	790.0	873.0	961.5
Abu Dhabi	413.9	481.1	469.5	480.1	490.2	529.0	592.6
Al Ain	161.2	153.5	182.8	186.9	190.9	232.2	259.1
Al Gharbia	92.0	87.6	104.3	106.7	108.9	111.7	109.9

Source: Abu Dhabi Water and Electricity Company

* Preliminary estimates

Figure (4): Consumption of desalinated water by region - 2011



Source: Statistics Center – Abu Dhabi

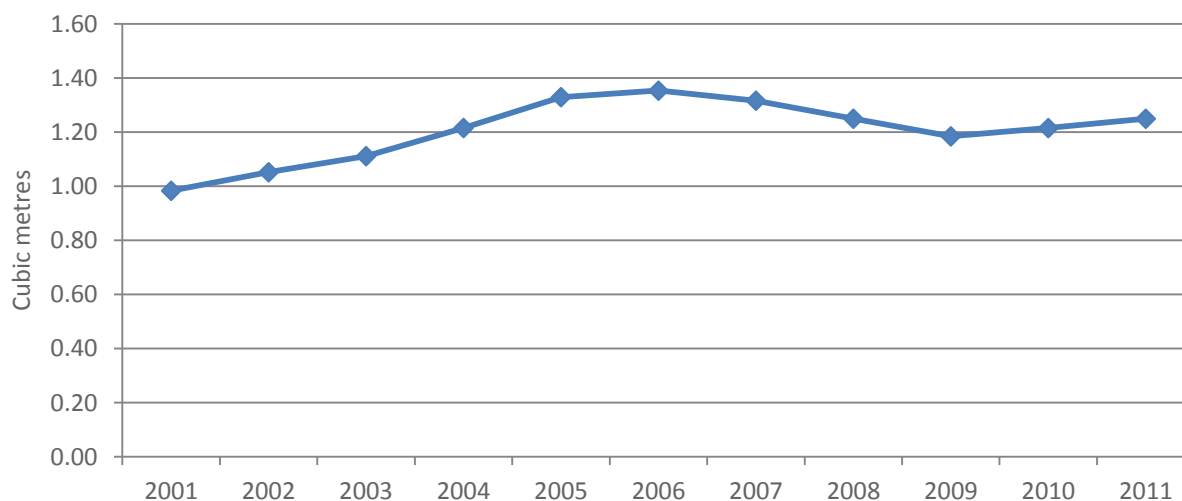
Table 1.11: Percentage of desalinated water consumption by sector

%

Sector	2008	2009	2010	2011
Domestic Sector	68.4	43.7	55.2	54.3
Commercial	9.6	15.3	15.5	15.7
Government	16.9	32.8	22.4	22.2
Agriculture	3.4	5.2	4.0	3.2
Industry	0.7	1.4	1.5	1.9
Other Sectors	1.1	1.6	1.4	2.7

Source: Abu Dhabi Distribution Company, Al Ain Distribution Company

Figure (5): Per capita average daily consumption of desalinated water



Source: Statistics Center – Abu Dhabi

Carbon dioxide emissions

Since 2006, the water and electricity production sector in the Emirate of Abu Dhabi is witnessing in general a decrease in per capita carbon dioxide emissions which reached in 2011 about 13.6 tons. For the same year, total emissions of carbon dioxide from the sector reached about 28.79 million tons.

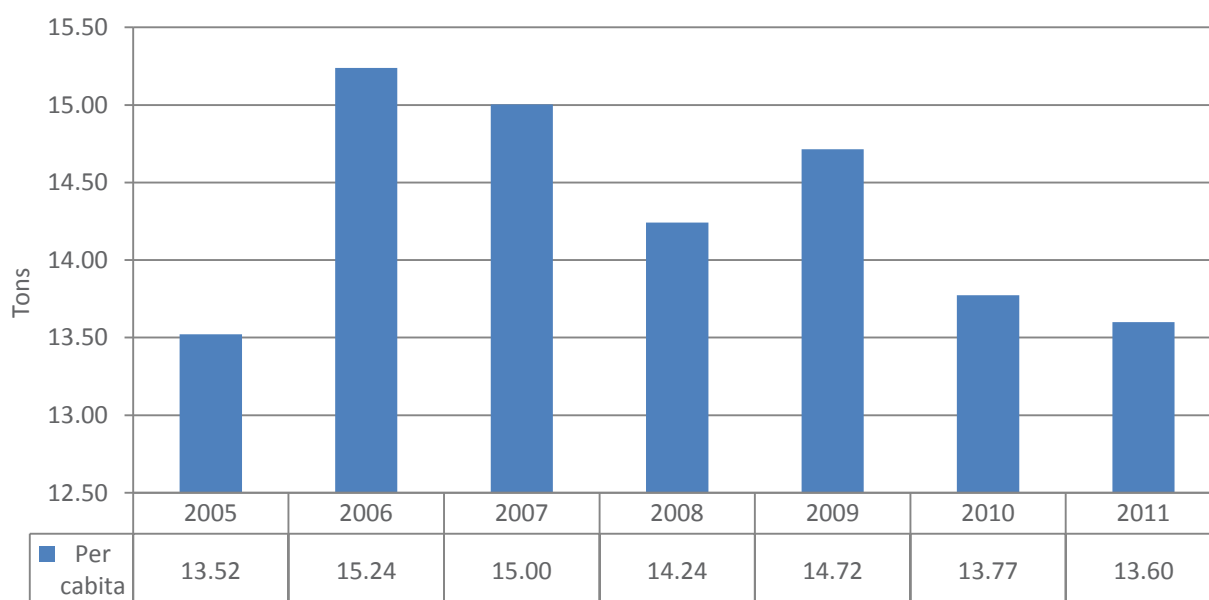
Table 1.12: Carbon dioxide emissions - water and electricity production sector

Million tons

Source	2005	2006	2007	2008	2009	2010	2011
Total	19.76	22.27	23.62	24.15	26.88	27.10	28.79
Arabian Power Company	7.25	8.15	7.66	6.49	7.23	8.04	7.23
Shuweihat CMS International Power Company	2.31	4.36	4.50	4.58	5.25	5.31	4.92
Emirate s CMS Power Company	2.66	2.75	2.63	2.57	2.39	2.49	2.38
Gulf Total Tractebel Power Company	3.05	2.86	3.90	3.87	3.87	4.08	4.24
Taweelah Asia Power Company	3.97	3.55	4.22	5.65	7.00	7.17	8.20
Al Mirfa Power and Distillation Plant	0.45	0.53	0.68	0.98	1.14	0.01	0.78
Zayed City Energy Plant	0.07	0.07	0.03	0.01	0.00	na	na
Ruwais Power Company	na	na	na	na	na	na	1.03

Source: Abu Dhabi Water and Electricity Authority - ADWEA

Figure (6): Per capita carbon dioxide emissions - water and electricity production sector



Source: Statistics Center – Abu Dhabi

Air pollutant total emissions

Table (1.13) reflects the total air pollutant emissions, which add up together the total emissions of sulphur dioxide, nitrogen oxides, and volatile organic compounds. Total air pollutant emissions from water and electricity production sector fluctuated over the years since 2004 between increasing and decreasing, however the general trend of these emissions is gradually decreasing. In 2011, the total emissions decreased by 11.4 per cent from 17,910.12 tons in 2010 to 15,863.00 tons in 2011.

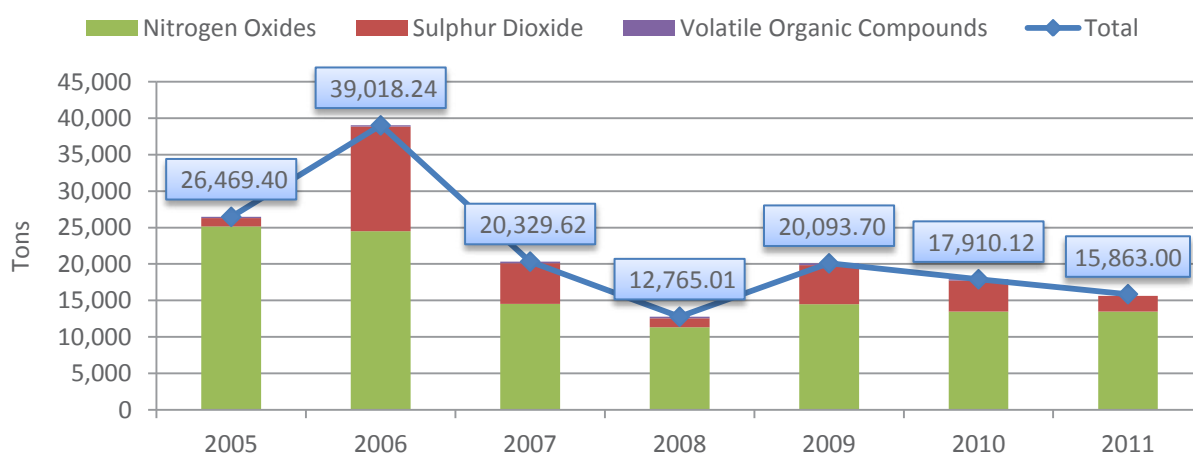
Table 1.13: Air pollutant total emissions - water and electricity production sector

Tons

Year	Total	Sulphur Dioxide	Nitrogen Oxides	Volatile Organic Compounds
2004	6,516.78	270.89	6045.23	200.66
2005	26,469.40	1,141.07	25161.27	167.06
2006	39,018.24	14,369.72	24490.50	158.02
2007	20,329.62	5,606.26	14512.77	210.59
2008	12,765.01	1,233.47	11307.25	224.29
2009	20,093.70	5,383.04	14479.63	231.03
2010	17,910.12	4,240.03	13481.09	189.00
2011	15,863.00	2,134.00	13,497.00	232.00

Source: Abu Dhabi Water and Electricity Authority - ADWEA

Figure (7): Air pollutant total emissions - water and electricity production sector



Source: Abu Dhabi Water and Electricity Authority – ADWEA, Statistics Center – Abu Dhabi

Occupational health and safety

In 2011, the number of Lost Time Injury Incidents in the companies working in water and electricity activity under ADWEA totaled 12 incidents, and there were no fatality incidents. 2011 witnessed one Road Traffic Incident and 10 Dangerous Occurrence. Lost Time Injury Frequency Rate (LTIFR) was 0.33 injuries for each one million working hours.

Table 1.14: Number of occupational health and safety incidents - water and electricity production sector

Item	2005	2006	2007	2008	2009	2010	2011
Fatality Incidents	1	2	0	3	3	6	0
Fatality Non Recordable	0	0	0	0	0	0	0
Disability Incident	0	0	0	0	0	1	0
Lost Time Injury Incidents	9	15	18	27	19	22	12
Medical Treatment Case	5	18	43	290	531	472	8
Restricted Workday Case	0	2	2	3	4	1	0
Journey Incident	0	0	0	0	3	0	na
Reporting Dangerous Occurrence	0	5	6	6	9	4	10
Occurrence of Occupational Disease	0	0	0	0	0	0	0
Road Traffic Incidents	44	14	15	15	8	3	1
Near miss	47	96	281	1014	1,495	596	1355

Source: Abu Dhabi Water and Electricity Authority - ADWEA

Table 1.15: Rate of injuries and incidents registered per million man-hours worked - water and electricity production sector

Item	2005	2006	2007	2008	2009	2010	2011
Number of Working Hours (<i>Million Hours</i>)	9.85	20.99	25.08	36.85	50.57	42.13	36.08
Lost Time Injury Frequency Rate (LTIFR)	0.91	0.71	0.72	0.73	0.38	0.52	0.33
Lost Time Injury Severity Rate (LTISR)	2.10	4.20	14.40	6.10	4.70	17.10	7.51
Total Reportable Case Frequency (TRCF)*	0.10	1.00	1.70	8.00	10.60	11.30	0.50

Source: Abu Dhabi Water and Electricity Authority - ADWEA

*Includes Fatal Accident Rate (FAR)

Oil and gas statistics

Oil and gas sector is deemed to be an important pillar in the economy of Abu Dhabi as it forms a huge share of its GDP. In 2011, Abu Dhabi produced 913,919 thousand barrels of crude oil, of which 835,931 thousand barrels were exported. The average prices of crude oil increased by 39 per cent compared with 2010 reaching an average of 109.5 \$/Barrel as shown in tables (2.1) and (2.2).

Crude oil production and exports

Exports of crude oil constituted about 91.5 per cent of 2011 total production as shown in table (2.1). In 2011, the total production increased by 87,900 thousand barrels, an increase of 10.7 per cent compared with 2010.

Table 2.1: Crude oil production and exports

Thousand barrels

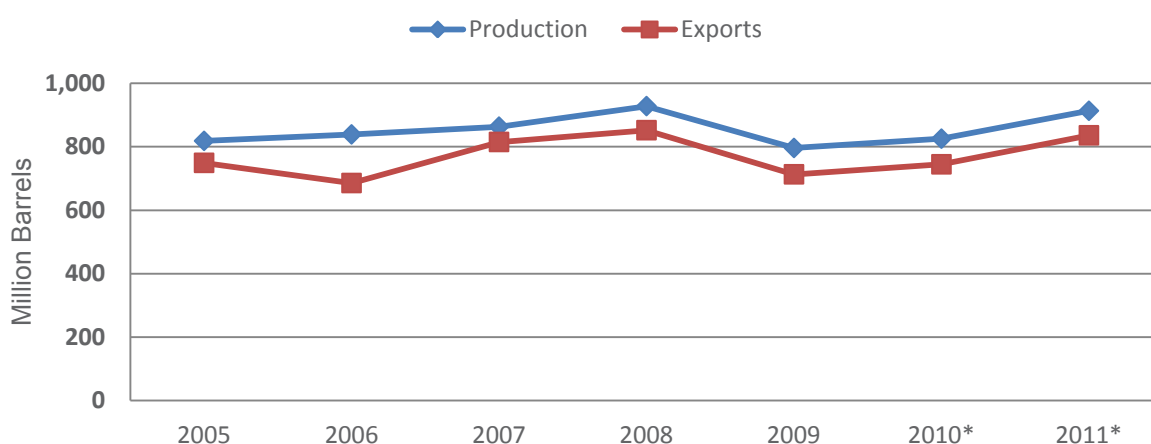
Year	Production		Exports	
	Daily average	Annual production	Daily average	Annual exports
2005	2,242	818,330	2,052	749,080
2006	2,298	838,770	1,878	685,470
2007	2,365	863,225	2,233	814,939
2008	2,536	928,000	2,329	852,072
2009	2,181	795,991	1,953	712,994
2010	2,261	825,291	2,040	744,525
2011	2502	913,919	2,290*	835,931*

Source: Abu Dhabi National Oil Company - ADNOC

Note: Production excludes condensates.

* Preliminary estimates

Figure (8): Production and exports of crude oil



Source: Abu Dhabi National Oil Company - ADNOC

* Preliminary estimates

Crude oil prices

Figure (2.2) shows the average crude oil prices increasing from 78.6 US\$ in 2010 to 109.5 US\$ in 2011. Table (2.2) shows that the prices of all types of crude oil increased by 38.4 and 39.7 per cent. The crude oil produced from Murban recorded the highest increase at USD 110.6.

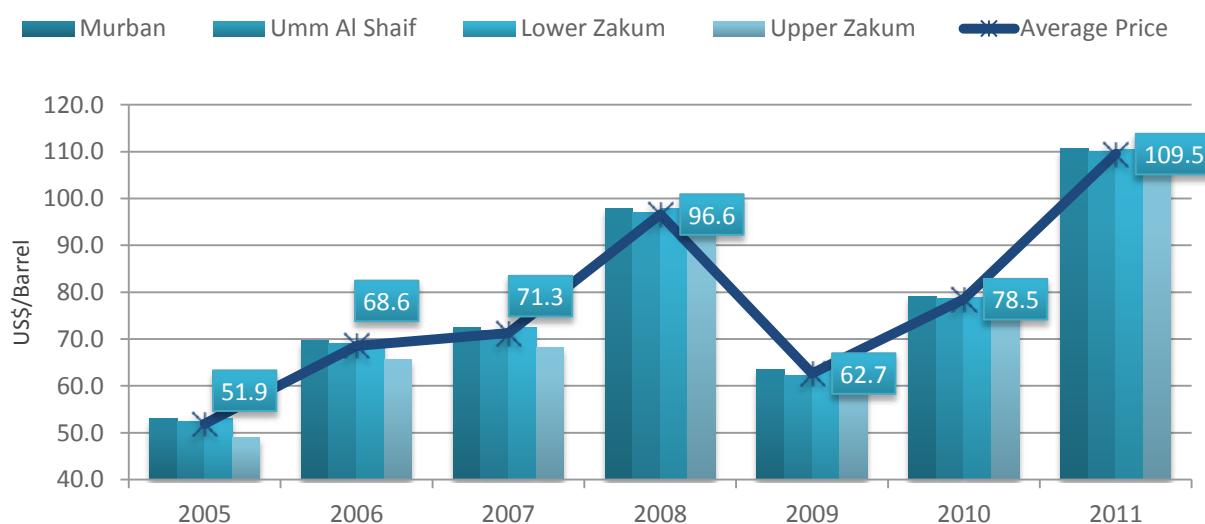
Table 2.2: Crude oil prices by type

US\$/Barrel

Type of crude	2005	2006	2007	2008	2009	2010	2011
Murban	53.1	69.8	72.5	97.8	63.5	79.2	110.6
Umm Al Shaif	52.5	69.0	71.8	96.9	62.3	78.7	110.0
Lower Zakum	53.1	69.8	72.5	97.8	63.5	79.0	110.4
Upper Zakum	49.0	65.6	68.3	93.9	61.4	77.3	107.0

Source: Abu Dhabi National Oil Company - ADNOC

Figure (9): Average prices of crude oil



Source: Abu Dhabi National Oil Company – ADNOC, Statistics Center – Abu Dhabi

Petroleum products

Abu Dhabi's Production of petroleum products increased by 7.7 per cent compared with 2010. Table (2.3) shows the production of by type of product.

Exports of refined petroleum products in 2011 formed 48.3 per cent of the total production, whereas Sales to other Emirates accounted for about 49.4 per cent of total domestic sales as shown in table (2.5).

2.3Table :Production of refined petroleum products

Thousand Metric Tons

Product Type	2005	2006	2007	2008	2009	2010	2011
Total	18,034.0	20,998.0	17,961.0	16,380.2	17,461.0	19,223	20,702
LPG	488.0	566.0	604.0	509.3	521.4	579.2	540.2
Unleaded gasoline	1,429.0	2,621.0	2,373.0	2,163.5	2,439.1	2,284.3	2,537.2
Naphtha	4,669.0	4,621.0	3,749.0	3,684.7	3,803.6	4,813.4	5,070.7
Jet Fuel / Kerosene	5,494.0	5,519.0	5,070.0	4,895.2	5,266.6	5,684.0	6,422.1
Gas Oil /diesel	4,217.0	4,427.0	4,210.0	4,138.8	4,367.2	4,775.1	5,024.4
Heavy fuel oil	1,689.0	3,204.0	1,870.0	904.9	1,022.2	1,047.8	1,066.8
Lubricants	48.0	40.0	43.0	46.0	na	na	na
Sulphur	na	na	42.0	37.8	41.1	38.9	40.9

Source: Abu Dhabi National Oil Company – ADNOC, TAKREER

Table 2.4: Domestic sales of refined petroleum products

Million imperial gallons

Product type	Abu Dhabi Emirate			Other Emirates		
	2008	2009	2010*	2008	2009	2010*
Total	1,528.4	1,593.0	1786	465.3	402	541.0
LPG	49.9	57.5	64.5	12.1	4.8	5.3
Unleaded gasoline	447.1	500.1	560.7	154.2	173.5	194.5
Jet fuel / Kerosene	430.3	468.5	525.3	83.9	69.8	78.2
Gas oil / diesel	575.2	557.5	625.0	213.3	153.2	171.7
Heavy fuel oil	17.3	2.1	2.3	0.8	na	na
Lubricants	8.6	7.3	8.2	1.0	1.1	1.2

Source: Abu Dhabi National Oil Company – ADNOC, TAKREER

*Preliminary estimates.

Table 2.5: Production and domestic sales of refined petroleum products

Thousand metric tons

Item	2005	2009	2010	2011
Production				
Quantity	18,034	17,461	19,223	20,702
Daily average	49.4	47.8	52.7	56.7
Domestic sales				
Quantity	3,473	9,360	10,496*	10,228*
Daily average	9.5	25.6	28.75*	28.02*
Exports				
Quantity	11,049	7,391	8,288	10,002
Daily average	30.3	20.2	22.7	27.4
Refining capacity (Thousand barrels/daily)	480	500	505	505

Source: Abu Dhabi National Oil Company – ADNOC

* Preliminary estimates.

Table 2.6: Export of refined petroleum products

Thousand metric tons

Type of Product	2005	2009	2010	2011
Total	11,035	7,390	8,288	10,002
Naphtha	4,628	3,608	4,269	5,209
Jet Fuel / Kerosene	3,968	2,815	3,219	3,806
Gad oil / Diesel	1,783	725	679	987
Fuel oil	656	242	121	na

Source: Abu Dhabi National Oil Company – ADNOC

Natural Gas

GASCO and ADGAS, two subsidiary companies of ADNOC, are engaged in the extraction of natural gas which has several uses in the Emirate. From natural gas, liquefied fuels and products such as propane, butane and pentane are produced, with most of them being exported. Such fuels are also used in the industry of steel, aluminum and cement. Some of the natural gas is injected back into oil wells in order to increase their production and stabilize their oil reserves.

Table 2.7: Natural gas production and usage

Million cubic feet

Year	2005	2006	2007	2008	2009*	2010*
Production						
Annual	2,069,550	2,118,825	2,157,550	2,076,642	1,966,580	2,068,695
Daily	5,670	5,805	5,911	5,674	5,388	5,668
Usage						
Annual	1,903,986	1,983,370	2,049,673	1,972,810	1,927,248	2,027,321
Daily	5,216	5,434	5,616	5,390	5,280	5,554

Source: Abu Dhabi National Oil Company - ADNOC

* Preliminary estimates.

Table 2.8: Production and exports of liquefied natural gas products by product type

Thousand metric tons

Product type	2008		2009		2010		2011	
	Production	Exports	Production	Exports	Production	Exports	Production	Exports
Total	15,690	13,771	14,778	14,193	15,222	14,604	15,679	15,028
LNG	5,918	5,483	5,467	5,410	5,631	5,567	5,800	5,759
Propane	3,227	3,190	2,920	2,871	3,007	2,954	3,097	3,030
Butane	2,957	2,903	2,832	2,689	2,917	2,767	3,004	2,838
Pentane (plus)	1,847	1,829	1,822	1,843	1,877	1,896	1,933	1,945
Others (sulphur)	1,741	366	1,738	1,380	1,790	1,420	1,844	1,456

Source: Abu Dhabi National Oil Company - ADNOC

Note: Excluding condensates.

Petrochemical products

Table (2.9) shows Abu Dhabi basic petrochemical products including polyethylene and fertilizers such as urea and ammonia. In 2011, polyethylene shared about 37.3 per cent of total volume of petrochemical production whereas urea and ammonia constituted about 25.3 and 20.7 per cent respectively.

Table 2.9: Production and Exports of petrochemical products

Metric tons

Product type	2010		2011	
	Production	Exports	Production	Exports
Total	2,014,568	1,324,453	2,789,528	2,147,658
Ammonia	472,011	75,034	465,159	49,134
Urea fertilizer	688,045	557,600	704,590	662,804
Polyethylene	716,700	648,411	1,041,747	893,618
Polypropylene	137,812	43,408	578,032	542,101

Source: Abu Dhabi National Oil Company - ADNOC

Table 2.10: Domestic sales of petrochemical Products

Metric tons

Product type	2007	2009	2010	2011
Total	113,879	81,851	99,848	145,645
Urea fertilizer	62,355	29,299	48,394	45,836
Polyethylene	51,524	52,552	47,617	69,524
Polypropylene	na	na	3,837	30,285

Source: Abu Dhabi National Oil Company - ADNOC

Carbon dioxide emissions

The amount of carbon dioxide emissions generated from oil and gas sector totaled 27.9 million tons, where emissions caused by the exploration and production sector increased by 2.1 million tons, meanwhile the per capita carbon dioxide emissions in 2011 was 13.2 tons.

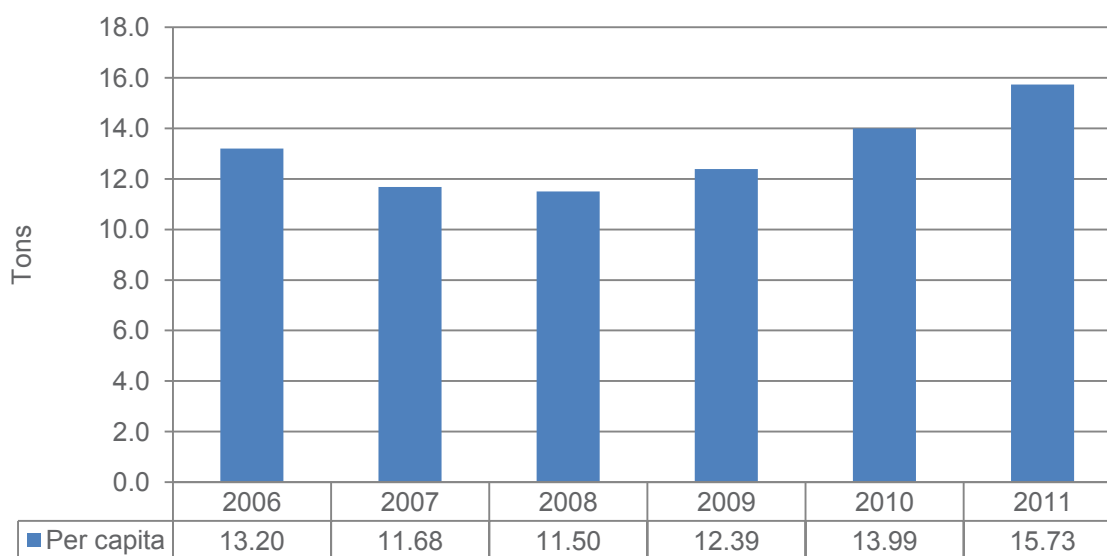
Table 2.11: Carbon dioxide emissions - oil and gas sector

Million tons

Business sector	2006	2007	2008	2009	2010	2011
Total	23.0	22.0	21.0	21.0	23.0	27.9
Exploration and production	16.0	15.0	15.0	14.0	15.0	17.1
Independent operators	1.0	1.0	1.0	1.0	1.0	1.0
Marketing & refining	5.0	5.0	4.0	5.0	4.0	6.3
Petrochemicals	1.0	1.0	1.0	1.0	3.0	3.4

Source: Abu Dhabi National Oil Company - ADNOC

Figure 10: Per capita carbon dioxide emissions - oil and gas sector



Source: Statistics Centre – Abu Dhabi.

Air pollutant total emissions

The period (2004-2011) experienced a decline in the total amount of emissions, which include sulfur dioxide emissions, nitrogen oxides and volatile organic compounds resulting from the economic activities related to oil and gas sector. In 2011, the total amount of gas emitted was about 359,550 tons.

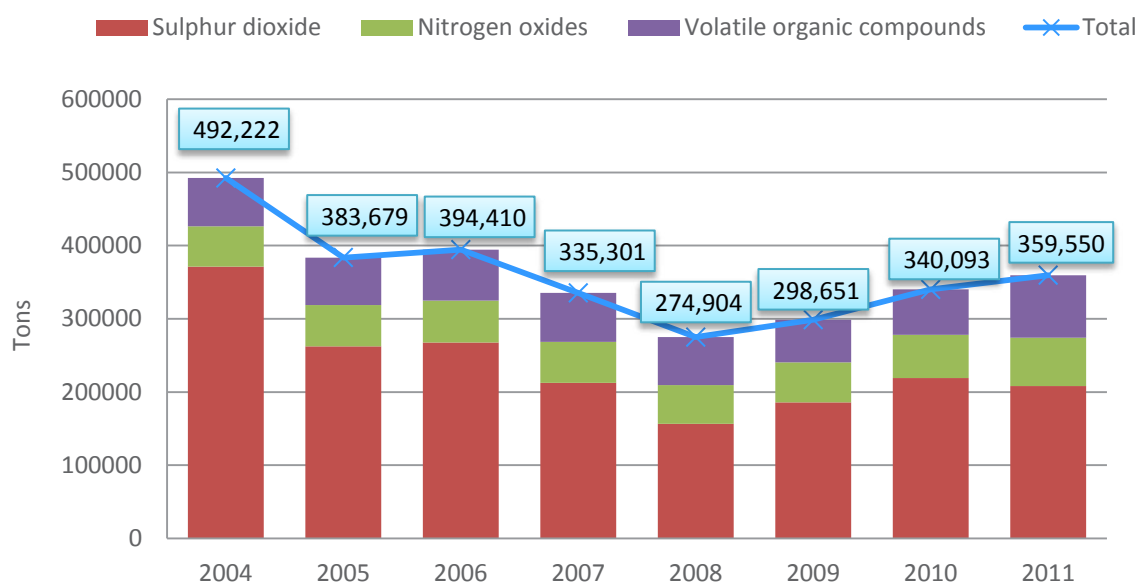
Table 2.12: Total air pollutant emissions - oil and gas sector

Tons

Year	Total	Sulphur dioxide	Nitrogen oxides	Volatile organic compounds
2004	492,222	371,328	55,176	65,718
2005	383,679	262,539	56,225	64,915
2006	394,410	267,739	57,332	69,339
2007	335,301	212,722	55,881	66,698
2008	274,904	156,674	52,755	65,475
2009	298,651	185,870	54,782	57,999
2010	340,093	219,022	58,901	62,170
2011	359,550	208,025	66,105	85,420

Source: Abu Dhabi National Oil Company - ADNOC

Figure (11): Total air pollutant emissions - oil and gas sector



Source: Abu Dhabi National Oil Company – ADNOC.

Occupational health and safety

In 2011, the number of working hours in the Abu Dhabi National Oil Company totaled 588.54 million hours, an increase of 65.8 per cent compared with 2010. This leads to an increase in the number of injuries and incidents in general. However, when analyzing incidents, it is clear that total reportable case frequency (TRCF) decreased to 0.58 and fatality incidents to 3.06 incidents for each one million working hours.

Table 2.13: Number of occupational health and safety incidents - oil and gas sector

Item	2005	2006	2007	2008	2009	2010	2011
Fatality incidents	6	5	4	4	7	4	18
Fatality non recordable	na	8	5	9	7	11	19
Disability incident	0	0	2	2	1	0	17
Lost time injury incidents	53	57	58	68	75	66	110
Medical treatment case	123	107	141	114	93	144	279
Restricted workday case	41	42	53	48	44	58	1
Journey incident	na	na	na	na	na	na	na
Reporting dangerous occurrence	na	na	na	na	na	na	na
Occurrence of occupational disease	na	na	na	na	na	na	na
Road traffic incidents	171	93	116	169	135	177	284
near miss	na	na	na	na	24,419	30,186	50,624

Source: Abu Dhabi National Oil Company - ADNOC

Table 2.14: Rate of injuries and incidents registered per million man-hours worked - oil and gas sector

Item	2005	2006	2007	2008	2009	2010	2011
Number of working hours (<i>million hours</i>)	171	191	230	298	313	355	588.54
Lost time injury frequency rate (LTIFR)	0.31	0.30	0.25	0.23	0.24	0.19	0.19
Lost time injury severity rate (LTISR)	na	na	na	na	na	na	na
Total reportable case frequency (TRCF)	1.27	1.08	1.09	0.79	0.68	0.76	0.58
Fatal accident rate (FAR)	3.50	2.62	1.74	1.34	2.23	1.13	3.06

Source: Abu Dhabi National Oil Company - ADNOC

Explanatory Notes

Glossary

This report contains certain terms specific to environment and necessary when analyzing the environment statistics of Abu Dhabi Emirate. They include the following terms:

Carbon dioxide (CO₂)

Colorless, odorless and non-poisonous gas that results from fossil fuel combustion, and is normally a part of ambient air. It is also produced in the respiration of living organisms (plants and animals), and considered to be the main greenhouse gas, contributing to climate change ⁽²⁾.

Carbon dioxide emissions (per capita)

Carbon dioxide emissions per capita is the total amount of carbon dioxide emitted by a country as a consequence of human (production and consumption) activities, divided by the population of the country. This include emissions of carbon dioxide include emissions from consumption of solid, liquid and gas fuels; cement production; and gas flaring. National reporting to the United Nations Framework Convention on Climate Change, which follows the Intergovernmental Panel on Climate Change guidelines, is based on national emission inventories and covers all sources of anthropogenic carbon dioxide emissions as well as carbon sinks (such as forests). Carbon dioxide emissions per capita are calculated by dividing carbon dioxide emissions by the number of people in the national population ⁽¹⁾.

Nitrogen Oxides (NO_x)

Product of combustion from transportation and stationary sources. It is a major contributor to acid dispositions and the formation of ground level ozone in the troposphere ⁽²⁾.

Sulphur Dioxide

Heavy, pungent colorless gas formed by the combustion of fossil fuels. It is harmful to human beings and vegetation, and contributes to the acidity in precipitation ⁽²⁾.

Desalinated water

Total volume of water obtained from desalination of (i.e., removal of salt from) seawater and brackish water ⁽³⁾.

Occupational health and safety

A discipline concerned with protecting the health and safety of people engaged with work by fostering a safe illness and accident-free environment. In other words, it is a set of procedure and rules within legislative framework aiming at protecting man from injures and possessions from being damaged or lost.

Data sources

Data are obtained from Abu Dhabi National Oil Company – ADNOC, Abu Dhabi Water and Electricity Authority – ADWEA, Abu Dhabi Future Energy Company – Masdar, Abu Dhabi Water and Electricity Company, Abu Dhabi Distribution Company, Al Ain Distribution Company and TAKREER. The data are processed and passed to Statistic Centre – Abu Dhabi for further editing and compilation.

Abbreviations used

\$	United States Dollars
AD	Abu Dhabi Emirate
ADNOC	Abu Dhabi National Oil Company
ADWEA	Abu Dhabi Water and Electricity Authority
BTU	British Thermal Unit
EMAL	Emirates Aluminum
GWH	Gigawatt per Hour
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MWH	Megawatt per Hour
na	Not Available
TAKREER	Abu Dhabi Oil Refining Company

Notes on tables

Value of (per cent) in all tables is based on unrounded numbers.

Due to rounding, totals may not equal the sum of component parts.

Unless otherwise indicated, all tables in this publication relate to the Emirate of Abu Dhabi. However, when mentioned in table titles or within table cells " Abu Dhabi " refers only to the Region of Abu Dhabi and not the whole Emirate.

More information and next release

For more information about environment & waste and other official statistics, please visit the statistics link on the SCAD website at <http://www.scad.ae>

The next release is expected in November 2013 for 2012 data.

References

1. United Nations Economic and Social Commission for Western Asia (ESCWA). (2007). Compendium of environment statistics in the ESCWA region. New York
2. United Nation Statistics Division (UNSD). (1997). Glossary of environment statistics (F, No 67). New York
3. United Nation Statistics Division (UNSD). (2010). Questionnaire 2010 on environment statistics (section: water). Retrieved from <http://unstats.un.org/unsd/environment/questionnaire2010.htm>

w w w . s c a d . a e

Tel: +971 2 8100000 - Fax: +971 2 8100800

P.O. Box: 6036, Abu Dhabi, U.A.E.