



Environment Survey Results

2013

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Foreword

The Statistics Centre – Abu Dhabi (SCAD) conducts annually a series of field surveys that help provide accurate and updated statistics on the Emirate of Abu Dhabi. The results of the Annual Environment Survey are of great importance to decision and policy makers, in addition to the business sector and researchers who require environment data for creating plans, analysis, studies and reports.

Results of the survey provides a broad database that covers environmental protection expenditure by sector, type of protection, health and safety, estimation of water and energy consumed, in addition to waste management statistics within each economic activity.

The report includes the summary of the final results of key environment indicators of yearly environment survey of five specialized economic surveys for the year 2013, namely: construction, transportation and storage, services, trade and industry. Thus, the results help measure the developments in these activities and the development that took place in the environmental sector.

SCAD is pleased to present this important report, which required significant field and office efforts over several months. We hope that it will meet the requirements of environmental data users at all levels.

Butti Ahmed Mohammed Bin Butti Al Qubaisi

Director General

Introduction

In the midst of the large economic development witnessed by the Emirate of Abu Dhabi and the growing interest in environment, it was necessary to broaden the environment database in the context of SCAD's efforts to meet the requirements of the Abu Dhabi Government. Environmental statistics enables the government to monitor environmental changes, and to make informed decisions on environmental policies.

The Annual Environmental Survey is a key source of the data necessary for the preparation of environmental statistics in SCAD. The survey collects environmental data on an annual basis from establishments operating in the Emirate of Abu Dhabi (Abu Dhabi, Al Ain and Al Gharbia). The information gathered by the survey is used to produce a wide range of statistics on environmental protection expenditure, occupational health and safety, energy consumption, water use and the amount of waste generated.

Key Points

1. Environmental Protection Expenditure Statistics

This chapter highlights the results of Annual Environmental Survey, which was carried out by SCAD. The survey aims to identify the expenditures on environmental protection activities in the Emirate of Abu Dhabi, in addition to identify forms of spending and provide data and information necessary to produce statistics consistent with the National Accounts.

Environmental protection expenditure is defined as the money spent on all activities and actions that are aimed at the prevention, reduction and elimination of pollution as well as any other degradation of the environment, resulting from human and economic activities.

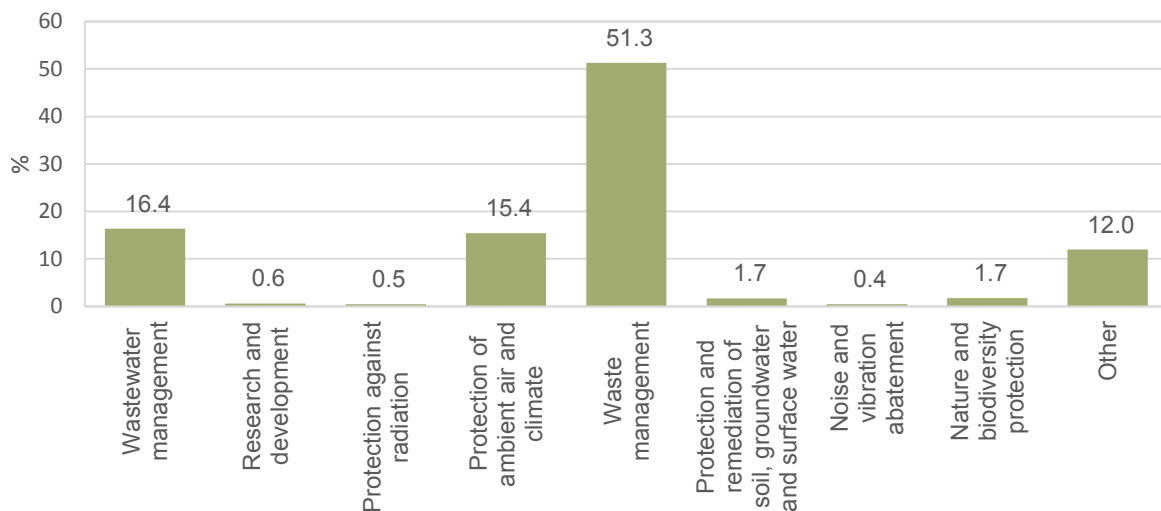
Statistics on environmental protection expenditure also shed light on environmental activities from financial aspects. These statistics are consistent with the National Accounts (NA) and part of the System of Environmental-Economic Accounting (SEEA), which has been adopted by UN statistical committee in February 2012.

Areas of environmental protection expenditure

Results of the survey show the environmental challenges facing the business sector in the; with the expenditure of economic establishments focused on waste management. In 2013, waste management constituted 51% of total environmental protection expenditure, followed by wastewater management and protection of ambient air and climate with 10% and 15% respectively.

Figure (1.1) shows that none of protection against radiation, research and development and noise and vibration abatement exceeded 1% of total of environment protection expenses.

Figure 1.1: Percentage distribution of environmental protection expenses by type - 2013

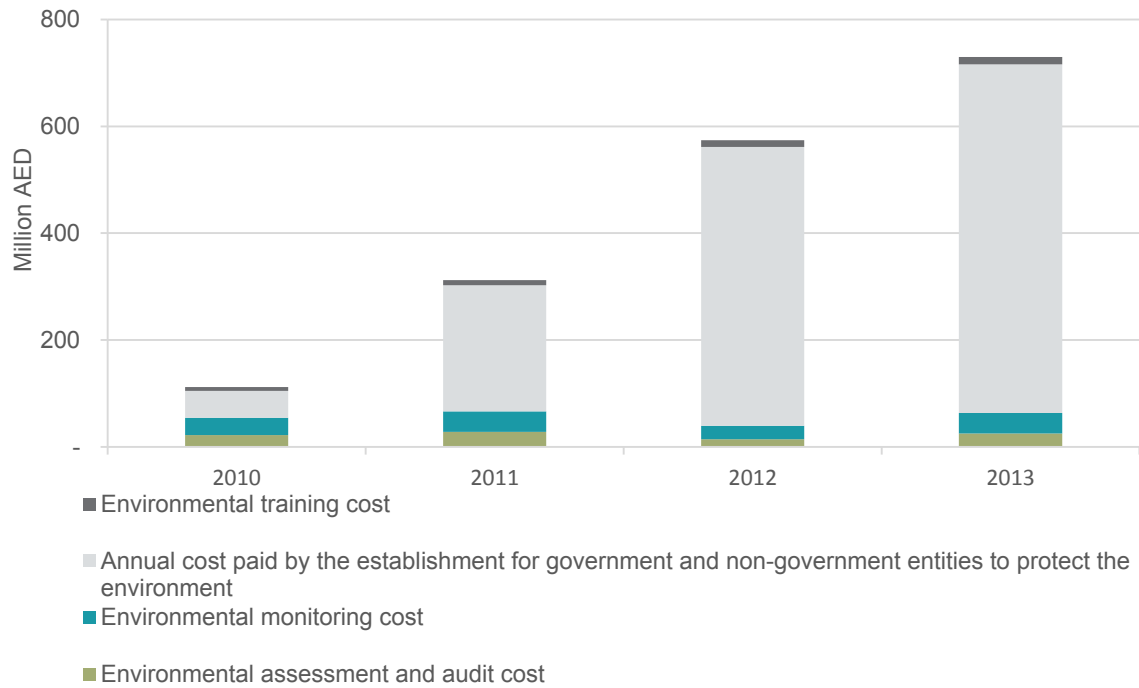


Source: Statistics Centre– Abu Dhabi

Cost of environmental protection in economic activities

The cost of environmental protection rose in five economic activities, namely, industry, construction, services, trade, transportation and storage from 573 million AED in 2012 to approximately 730 million AED in 2013, mainly due to the contracts between economic establishments and environment management companies, an increase of 25 per cent over the aforesaid period. In addition, in 2013 environmental monitoring increased to 54% from 2012. Regarding value of savings and revenues from environmental protection practices reached 494 million AED in 2013.

Figure 1.2: Percentages of cost of environmental protection activities



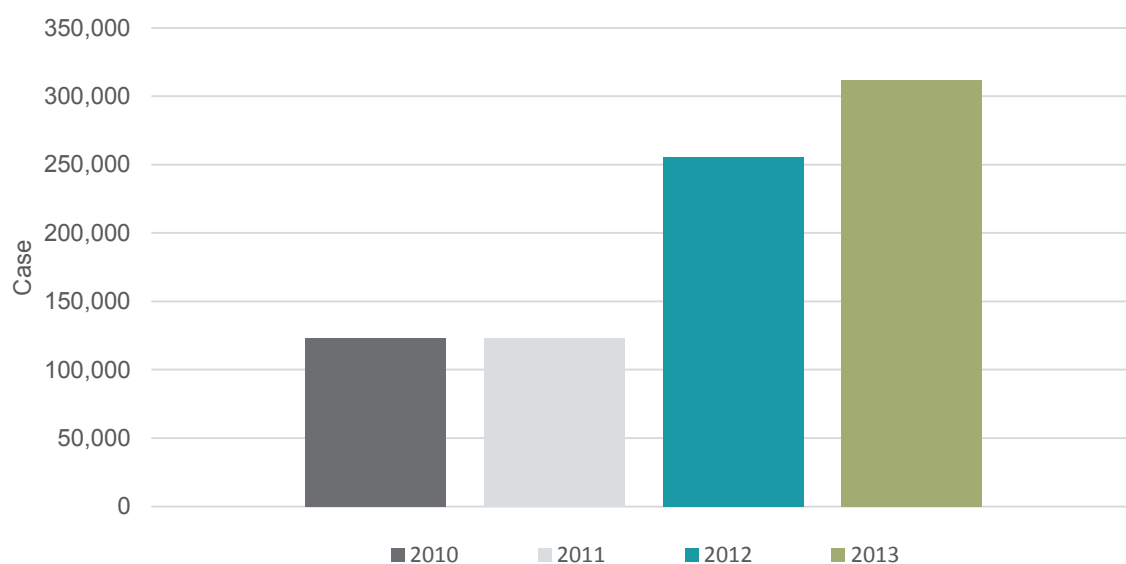
Source: Statistics Centre– Abu Dhabi

2. Occupational Health and Safety Statistics

Health and safety systems have been developed as result of the industrial, technological and social evolution; which affects businesses and labour. Occupational health and safety statistics provide policy and decision makers with a clear image that enables them to create occupational health and safety regulations in economic establishments depending on the type of activity and risks, which helps develop business sector and maintain labour health.

Figure (2.1) shows total number of reportable dangerous occurrences for the five economic activities. Reportable dangerous occurrences are an incident arising in the course of work that may or may not result in injuries and/or fatalities, in 2013 number of reportable dangerous occurrences reached 312,068 cases, up 22% compared with 2012.

Figure 2.1: Total Number of reportable dangerous occurrences



Source: Statistics Centre– Abu Dhabi

In 2013, fatal injuries in the industry, construction, services and transportation and storage sectors totalled 110 incidents, as shown in table (2.1); of which the construction activity accounted for 46%, mainly due to the number of work hours, which amounted to 2.4 billion hours, while in industry 42 fatal injuries were reported accounting for 38% of fatal incidents, sustained during the 1.5 billion hours worked by the sector in 2013.

Table 2.1 : Number of fatal Incidents by economic activity

Economic Activity	2010	2011	2012	2013
Industrial	10	34	51	42
Construction	43	25	59	51
Services	13	8	2	11
Transportation and Storage	0	4	10	6
Total	66	71	122	110

Source: Statistics Centre– Abu Dhabi

Table (2.2) shows that industry activity had the highest lost-time injury rate at 23.4 case per million hours worked, followed by services activity and transportation and storage activity with 22.9 and 12.2 injuries per million working hour respectively.

Table 2.2 : Rate of Injuries and Incidents Registered per Million Man-Hours Worked by economic activity - 2013

Item	Industrial	Construction	Services	Transport and storage
Number of working hours (million hours)	1,464	2,418	1,592	336
Fatal accident rate per million working hour (FAR)	0.029	0.021	0.007	0.018
Lost time injuries rate per million working hour (LTIR)	23.4	11.3	22.9	12.2

Source: Statistics Centre– Abu Dhabi

3. Water and wastewater usage in the industrial sector statistics

The industrial sector consumes and uses a significant amount of water in the Emirate of Abu Dhabi: in 2013, the industrial sector consumed 10,086 million cubic metres from different sources. Table (3.1) shows that general water network consumption rose by 11% in 2013 compared with 2012. Seawater consumption also rose by 6% during the same period. Seawater is mainly used for cooling purposes in process industries and power plants, 89% of the seawater used is discharged back into the sea.

Table 3.1 : Amount of water wastewater usage in industrial sector by type

Million cubic metre

Item	2010	2011	2012	2013
General Water Network	11.7	35.8	25.2	27.9
Sea Water	11,116	10,988	9,525	10,058
Ground Water	5.22	7.46	0.18	0.27
Total	11,133	11,032	9,550	10,086

Source: Statistics Centre– Abu Dhabi

Wastewater treatment from general water network

Table (3.2) shows the amount of treated wastewater at 755 thousand cubic metres in 2013, an increase of 10% over 2012 as shown in table (3.2), while the amount of reused treated wastewater totaled 84% in 2013, an increase of 27% compared with 2012. Figure (3.1) illustrates the progress achieved in the reuse of treated wastewater by economic establishments.

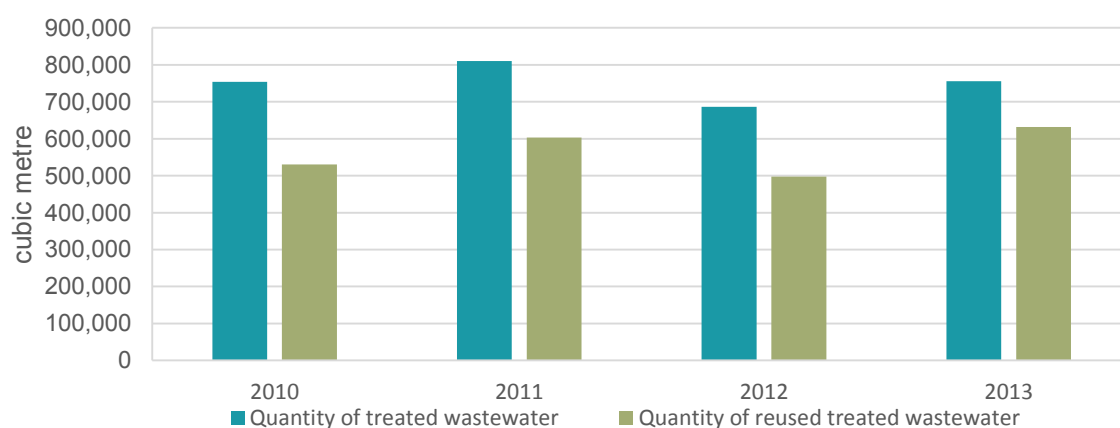
Table 3.2 : Quantities of treated wastewater and reused treated wastewater in industrial sector

Cubic metre

Item	2010	2011	2012	2013
Quantity of treated wastewater	753,700	809,952	686,413	755,418
Quantity of reused treated wastewater	530,138	603,470	497,650	631,437

Source: Statistics Centre– Abu Dhabi

Figure 3.1 : Amount of wastewater treated and wastewater treated reuse in industrial sector



Source: Statistics Centre– Abu Dhabi

4. Energy Consumption statistics

Energy is for the driving force of all economic activities. Fossil fuels, which are measured in Billion British Thermal Units (BBTU), are used in the industry to produce final products.

In 2013, the total amount of energy consumed in the Emirate of Abu Dhabi in the five economic activities shown in table (4.1) totalled around 935 Thousand Billion British Thermal Units, as well as total amount of electrical power consumed around 90 Thousand Billion British Thermal Units. Figure (4.1) shows the percentage distribution of electrical power consumption in the main five economic activity. The industry activity accounted for the largest proportion of total energy consumption (39%), followed by the services activity with a 24%, and the least electricity consumption goes to the transportation and storage activity with a 5% from the total amount of produced electricity consumption from all five economic activities.

Total amount of natural gas produced got 740 Thousand Billion British Thermal Units; Total amount Energy consumption in the industrial sector reached 85% from total consumption of energy from all economic activities, where industrial activity is depends mainly on natural gas by 93%; however this consumption includes electric power production. Figure (4.2) displays percentages of fossil fuels consumption by economic activity.

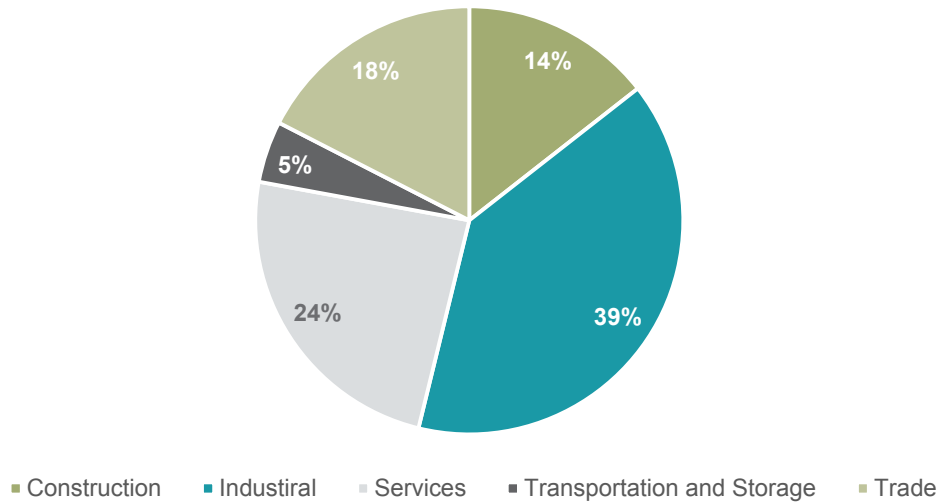
Table 4.1 : Amount of Fuel consumed by type and economic activity - 2013

BBTU

Type	Industrial	Construction	Transport and storage	Services	Trade	Total
Electricity	35,285	12,932	4,170	21,564	15,640	89,591
Gasoline	2,916	2,830	7,933	4,204	12,298	30,181
Diesel	16,955	34,492	10,075	1,198	6,325	69,044
Kerosene	2.28	0	1.08	6,159	4.73	6,167
Natural Gas	738,361	0.82	192	1,326	7.25	739,887
Grand Total	793,519	50,254	22,371	34,452	34,275	934,871

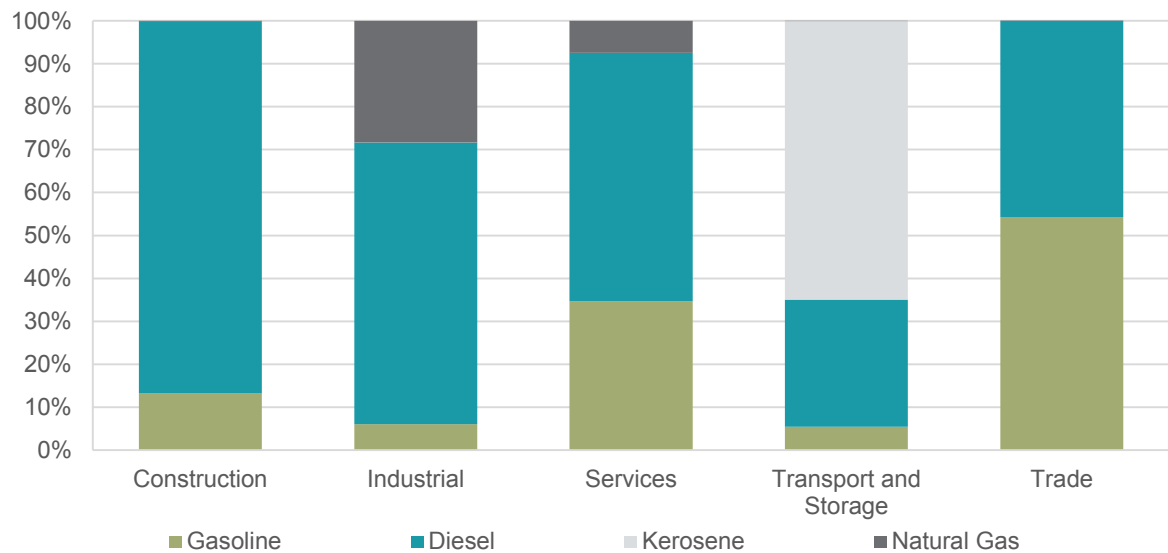
Source: Statistics Centre– Abu Dhabi

Figure 4.1: Percentage of electricity consumption by economic activity - 2013



Source: Statistics Centre– Abu Dhabi

Figure 4.2: Percentage of fuel consumed by economic activity – 2013

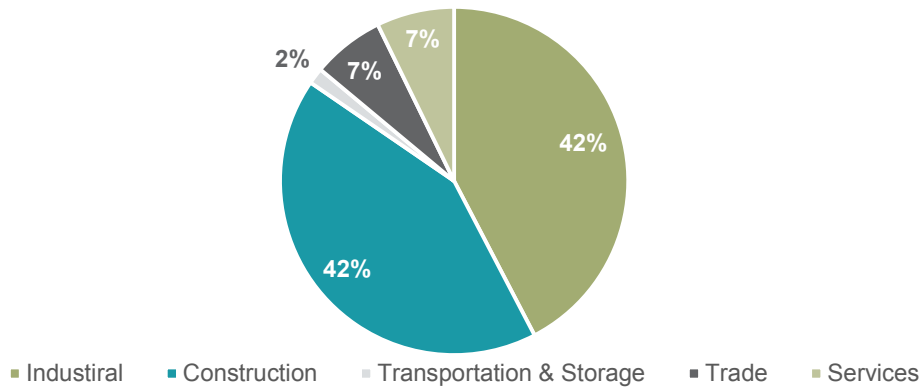


Source: Statistics Centre– Abu Dhabi

5. Non-hazardous solid waste statistics

Waste is considered one of the challenges facing the environment in the Emirate of Abu Dhabi; therefore SCAD conducted a study on waste management in economic activities. In 2013, total amount of non-hazardous solid waste generated weighed 2,249 thousand tons. Figure (5.1) shows the percentage distribution of total non-hazardous waste produced that the industrial and construction activities produced 42% each, with transportation and storage showing the lowest waste production percentage (2%).

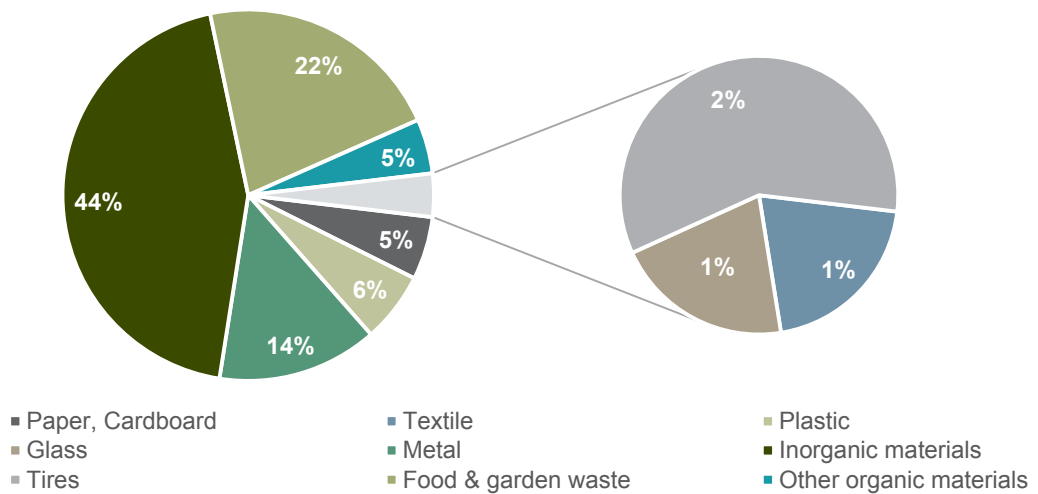
Figure 5.1: Percentage distribution of non-hazardous solid waste by economic activity - 2013



Source: Statistics Centre– Abu Dhabi

The results of the study revealed that the largest component of non-hazardous solid waste is inorganic materials with 44%, followed by food and garden waste at 22%. Tires, textiles and glass waste constituted the lowest proportion of solid waste as illustrated in figure (5.2).

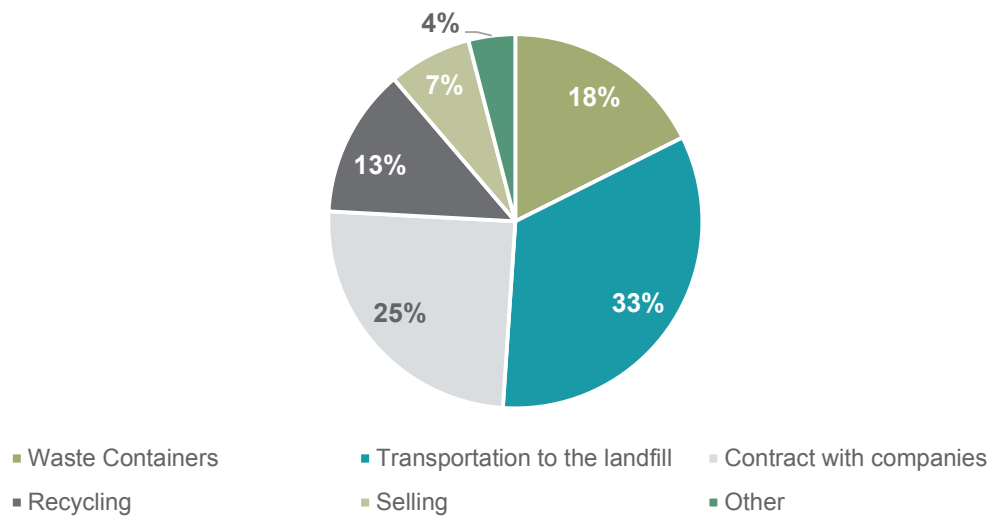
Figure 5.2: Percentage distribution of non-hazardous solid waste (organic-inorganic) solid waste by composition – 2013



Source: Statistics Centre– Abu Dhabi

Figure (5.3) shows the percentage distribution of waste by disposal method; data reveals that 33% of the total solid waste generated was transported to landfills, the largest share compared with other disposal methods, followed by the proportion disposed through the contract concluded with other companies (25%), while other disposal methods , which include dumping, incineration, special treatment, storage, etc., accounted for a combined share of 4%, the lowest compared with the other disposal methods.

Figure 5.3: Percentage distribution of solid waste by disposal method - 2013



Source: Statistics Centre– Abu Dhabi

Appendix

1. Survey objectives

Economic surveys are of great importance; they provide a wide range of data covering various economic activities operating in the emirate of Abu Dhabi. The Statistics Centre – Abu Dhabi carried out environment surveys to collect 2013 data. The survey objectives include:

1. Provide data to support environmental policies and decision making in Abu Dhabi Emirate and measure the performance of these policies.
2. Support the projects of Abu Dhabi Government related to environment statistics such as the GHG inventory, occupational health and industrial security.
3. Provide the data required by entrepreneurs, business men and investors to take appropriate decision and evaluate their investment decisions.
4. Contribute to providing a strong base of environmental statistical data in the Emirate with regard to economic activities.
5. Provide baseline data for measuring progress in achieving the agenda of Abu Dhabi Government and Abu Dhabi's Vision 2030.
6. Contribute to building the UAE's national statistical system through the provision of the Emirate's detailed data.
7. The project will also produce some new indicators, required by a number of Government entities that are not provided by the available administrative data sets.

2. Statistical Units and Classifications

Data was collected from «Establishments» engaged in specified economic activities. Industry Classification was based on the “Two Digit Level” of the International Standard Industrial Classification of All Economic Activities (ISIC Rev.4).

The sectors covered by the survey are:

1. Industry. Includes:
 - Mining and quarrying.
 - Manufacturing.
 - Electricity, gas, steam and air conditioning supply.
 - Water supply; sewage, waste management and remediation activities.

2. The construction.
3. Trade sector. It includes:
 - Wholesale and retail trade; repair of motor vehicles and motorcycles.
4. Transportation and storage.
5. Services. It includes:
 - Accommodation and food services activities.
 - Real estate activities.
 - Professional, scientific and technical activities.
 - Public administrative and support services activities.
 - Education.
 - Human health and social work activities
 - Arts, entertainment and recreation.
 - Other service activities.

3. Methodology

The latest international methodologies and recommendations of conducting economic statistics surveys have been followed in terms of definitions, concepts and methodology of collecting basic data. Data and indicators have been extracted from the actual results of the survey.

3.1 Sample Design

The frame for the survey is based on the 2013 “Frame Update Project” for the Emirate of Abu Dhabi. The frame has been divided into three strata: large, medium and small based on the number of employees. A comprehensive count was applied on the large stratum, while stratified systematic random sample was used for medium and small categories.

3.2 Reference Year

Data was primarily collected from establishments for the calendar year of 2013. In case of data provided by some establishments for different accounting years, data was collected from an accounting period that falls mostly in the survey year.

3.3 Survey Documents

Documents of the survey include the questionnaire, training manual for field researchers and audit rules manual.

The questionnaire was designed to collect all survey objectives. Survey objectives are:

1. Introductory and general data about the establishment.
2. Value of environmental protection expenditure.
3. Health and safety statistics.
4. Water consumption statistics.
5. Energy consumption statistics.
6. Waste management statistics.

3.3.1 Training Manual

The training manual contains terms used in the questionnaire in order to clarify them for those, who are working in the field and office audit. It also includes a detailed explanation of all questions and how to fill the data in a way that guarantee the highest degree of accuracy of the questionnaire. Likewise, the manual includes duties of personnel conducting the survey such as, supervisors, enumerators and auditors.

3.3.2 Auditing Rules Manual

The manual includes basic rules that should be followed by researchers as well as auditors while conducting their work. It also contains the basic rules of technical revision and tables' revision.

4. Work Stages

4.1 Preparatory Stage

This stage included identifying objectives of the survey and designing the questionnaire. Training and auditing manuals, and office and field reviewing were also prepared during this stage.

4.2 Fieldwork Stage

Fieldwork was carried out by trained researchers, who have been selected previously according to specific criteria. They were divided into teams and supervised by field supervisor.

4.3 Office Processing

Completed questionnaires were delivered to the auditing section to be fully audited. Poor quality responses were identified and fixed by subject matter experts or referred back to the establishment for correction. Finally, questionnaires were coded and sent to the Data Entry section.

4.4 Electronic Processing

Once the questionnaire is audited and encoded, data entry staff use a specially designed application to enter questionnaires. Preliminary results were extracted and audited to ensure data accuracy. Then lift coefficients are used to extract final results.

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