



# Environment Survey Results

# 2014

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## Introduction

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 results of key environment indicators of yearly environment survey of five specialized economic surveys for the year 2014, 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.

The study shows the reduction in expenses on environmental protection activities. However, economic activity tended to increase spending on surveillance and follow-up environmental procedures in order to reduce expenditure on the environmental impact. In addition, the industrial operations conducted several practices for optimal utilization of available resources such as waste selling and recycling of a 21 % of the total amount of waste with achieved income of about 900 million AED and has become a significant economic benefit, especially in industrial activity. The rose of awareness in the requirements of occupational health and safety increased the commitment to develop procedures, record incidents and control, which is evident in the growth of the number of registered ceases that goes parallel with economic development in various sectors, an increase of 25%. It has noted from the study of energy consumption that service sector dependency on natural gas has increased with more than 90% from entire energy consumption of this specific sector.

As we put between the hands of users this important issue, which includes the fruit of the efforts and field office strenuous made over several months, we can only hope that meets the environmental data users at all levels requirements.

## Key Points

### Environmental Protection Expenditure Statistics

This chapter highlights the results of Annual Environmental Survey, which 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.

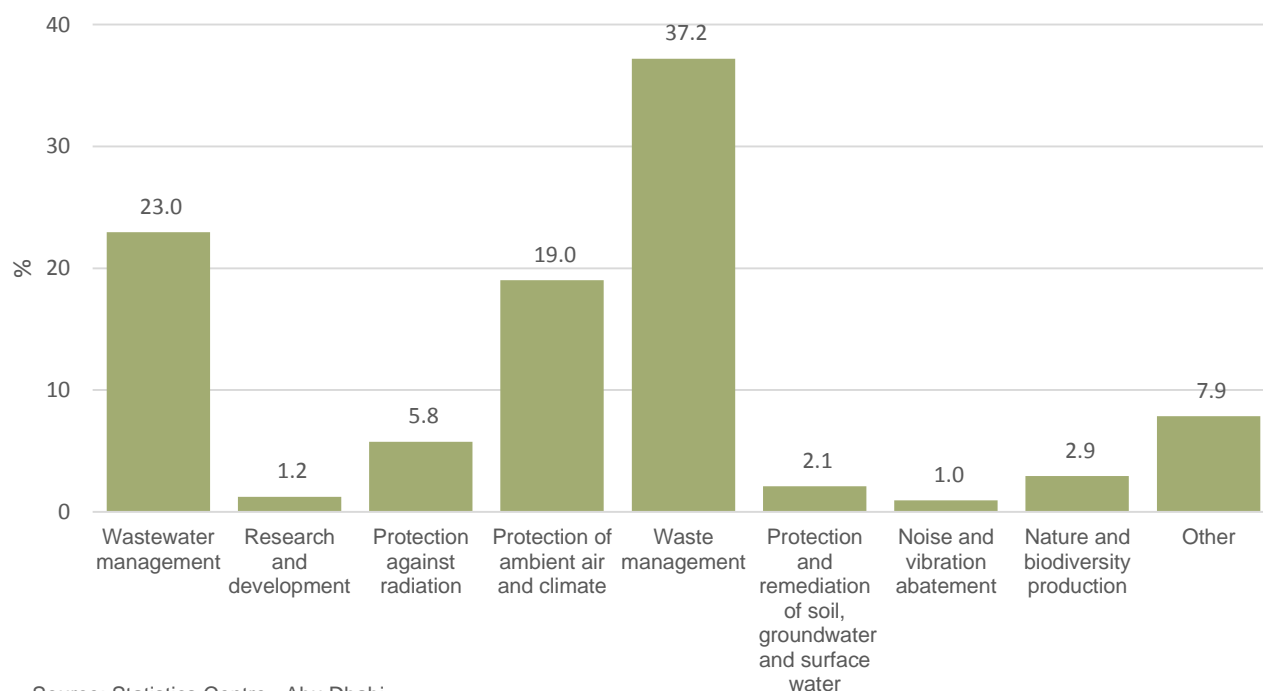
Environmental and economic accounting integrated system issued by the United Nations includes a full set of accounts showing within the components the expenditure on environmental protection in various fields. In 2014, expenditure of economic establishments in environmental protection activities in Abu Dhabi Emirate reached 1.36 billion AED compared with 1.55 billion AED in 2013 with a reduction rate of (-12.3) percentage.

#### 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 2014, waste management constituted 37% of total environmental protection expenditure, followed by wastewater management and protection of ambient air and climate with 23% and 19% respectively.

Figure 1.1 shows that none of research and development and noise and vibration abatement exceeded 1.5% of total of environment protection expenses.

**Figure 1.1: Percentage distribution of environmental protection expenses by type – 2014**

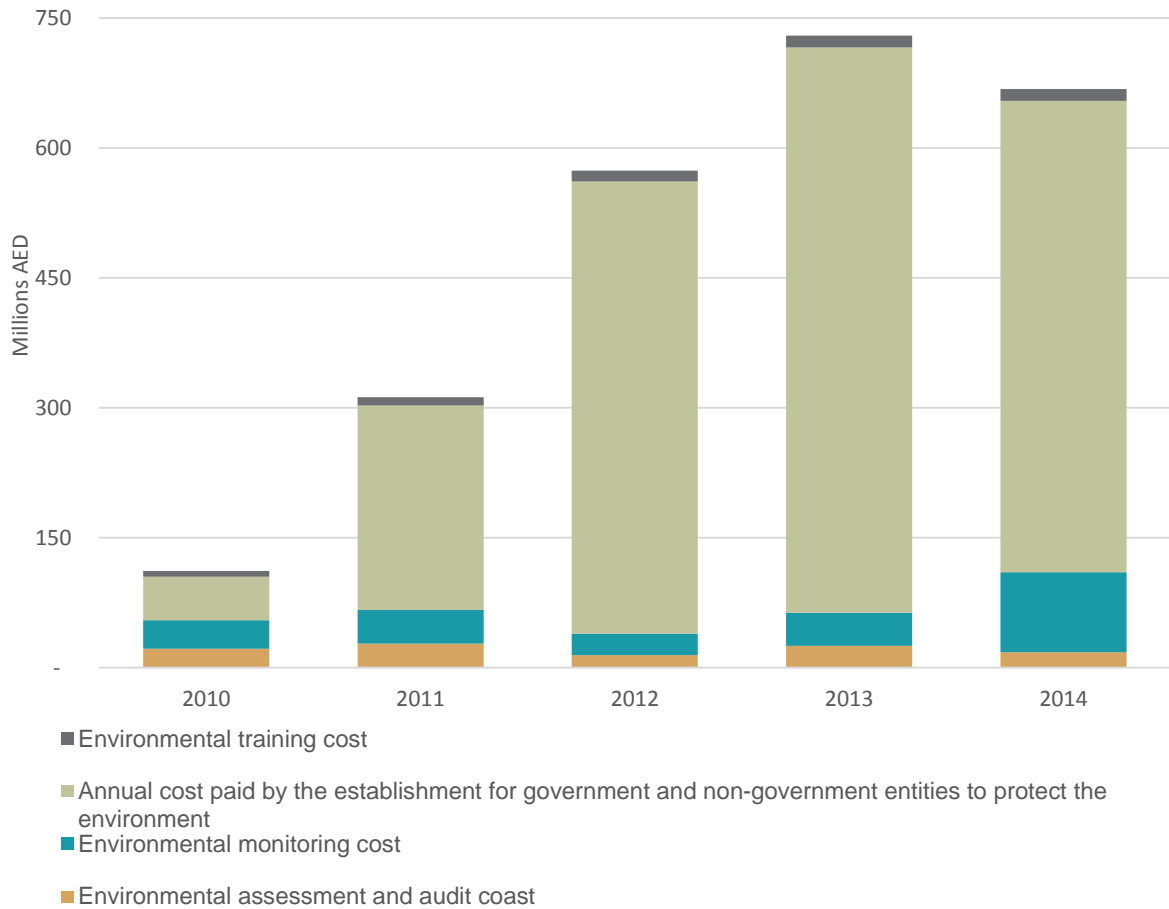


Source: Statistics Centre– Abu Dhabi

## Cost of environmental protection in economic activities

The cost of environmental protection decreased in the five economic activities, namely, industry, construction, services, trade, transportation and storage from 730 million AED in 2013 to approximately 668 million AED in 2014. Where the decrease rate was of 8.5% per cent between 2013 and 2014. In addition, environmental monitoring decreased to 30% from 2013. Regarding value of savings and revenues from environmental protection practices reached 909 million AED in 2014.

**Figure 1.2: Percentages of cost of environmental protection activities**



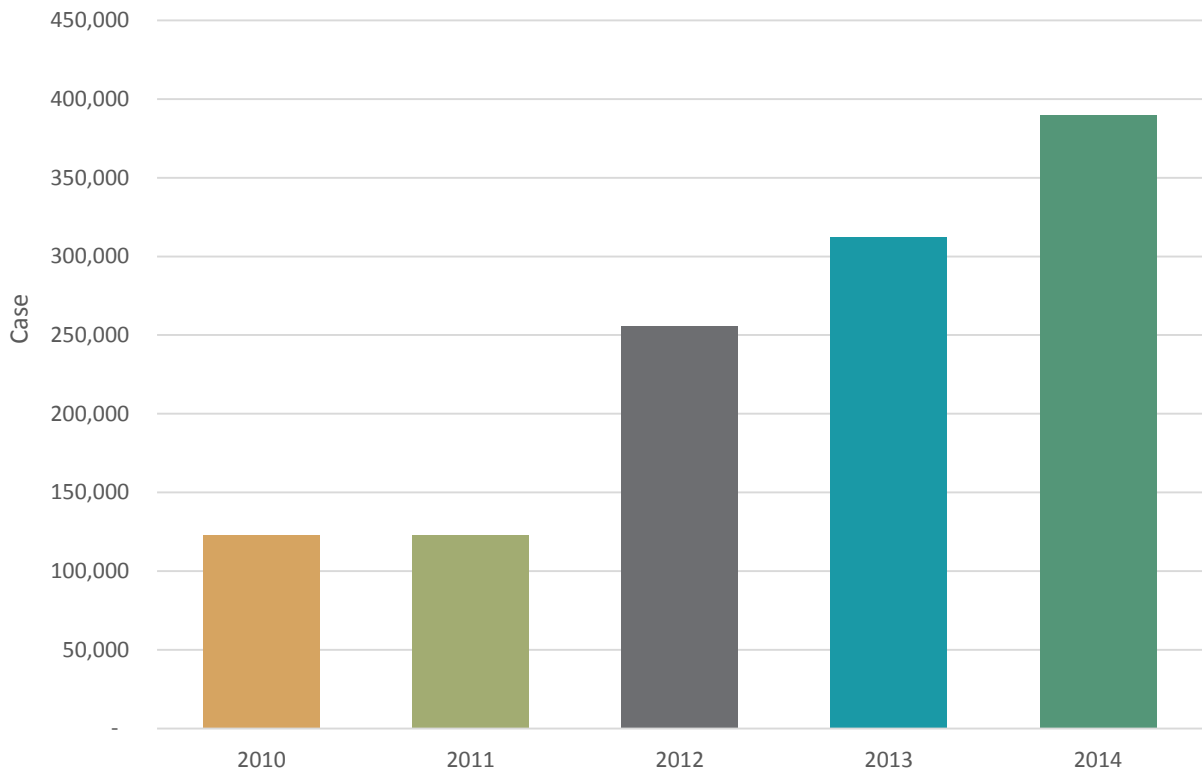
Source: Statistics Centre– Abu Dhabi

## Occupational Health and Safety Statistics

Health and safety systems have 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 (industry, construction, services, trade, transportation and storage). Reportable dangerous occurrences are incidents arising in the course of work that may or may not result in injuries and/or fatalities, in 2014 number of reportable dangerous occurrences reached 390,040 cases, up 25% compared with 2013.

**Figure 2.1: Total Number of reportable dangerous occurrences**



Source: Statistics Centre– Abu Dhabi

In 2014, fatal injuries in the industry, construction, services and transportation and storage totalled 114 incidents, as shown in table 2.1; of which the industry activity accounted for 57%, followed by construction with 32 fatal injuries were reported accounting for 28% in the same year.

**Table 2.1: Number of fatal Incidents by economic activity**

| Economic Activity          | 2010      | 2011      | 2012       | 2013       | 2014       |
|----------------------------|-----------|-----------|------------|------------|------------|
| Industrial                 | 10        | 34        | 51         | 42         | 65         |
| Construction               | 43        | 25        | 59         | 51         | 32         |
| Services                   | 13        | 8         | 2          | 11         | 9          |
| Transportation and Storage | 0         | 4         | 10         | 6          | 8          |
| <b>Total</b>               | <b>66</b> | <b>71</b> | <b>122</b> | <b>110</b> | <b>114</b> |

Source: Statistics Centre– Abu Dhabi

Table 2.2 shows that industry activity had the highest lost-time injury rate at 36.1 case per million hours worked, followed by construction activity and transportation and storage activity with 33.1 and 31.4 injuries per million working hour respectively.

**Table 2.2: Rate of Injuries and Incidents Registered per Million Man-Hours Worked by economic activity - 2014**

| Item                                                    | Industrial | Construction | Services | Transport and storage |
|---------------------------------------------------------|------------|--------------|----------|-----------------------|
| Number of working hours (million hours)                 | 829        | 967          | 1,399    | 117                   |
| Fatal accident rate per million working hour (FAR)      | 0.078      | 0.033        | 0.006    | 0.068                 |
| Lost time injuries rate per million working hour (LTIR) | 36.1       | 33.1         | 25.2     | 31.4                  |

Source: Statistics Centre– Abu Dhabi

## 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 2014, the industrial sector consumed 10,896 Million cubic metres from different sources. Table 3.1 shows that general water network consumption rose by 57% in 2014 compared with 2013. Seawater consumption also rose by 7.9% 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          | 2014          |
|-----------------------|---------------|---------------|--------------|---------------|---------------|
| General Water Network | 12            | 38            | 25           | 28            | 44            |
| Sea Water             | 11,116        | 10,988        | 9,525        | 10,058        | 10,848        |
| Ground Water          | 5             | 7             | 0.2          | 0.3           | 4             |
| <b>Total</b>          | <b>11,133</b> | <b>11,032</b> | <b>9,550</b> | <b>10,086</b> | <b>10,896</b> |

Source: Statistics Centre– Abu Dhabi

## Wastewater treatment from general water network

Table 3.2 shows the amount of treated wastewater at 1.1 million cubic metres in 2014, an increase of 47% over 2013 as shown in table 3.2, while the amount of reused treated wastewater totaled 78% in 2014. Figure 3.1 illustrates the progress achieved in the reuse of treated wastewater by industrial establishments.

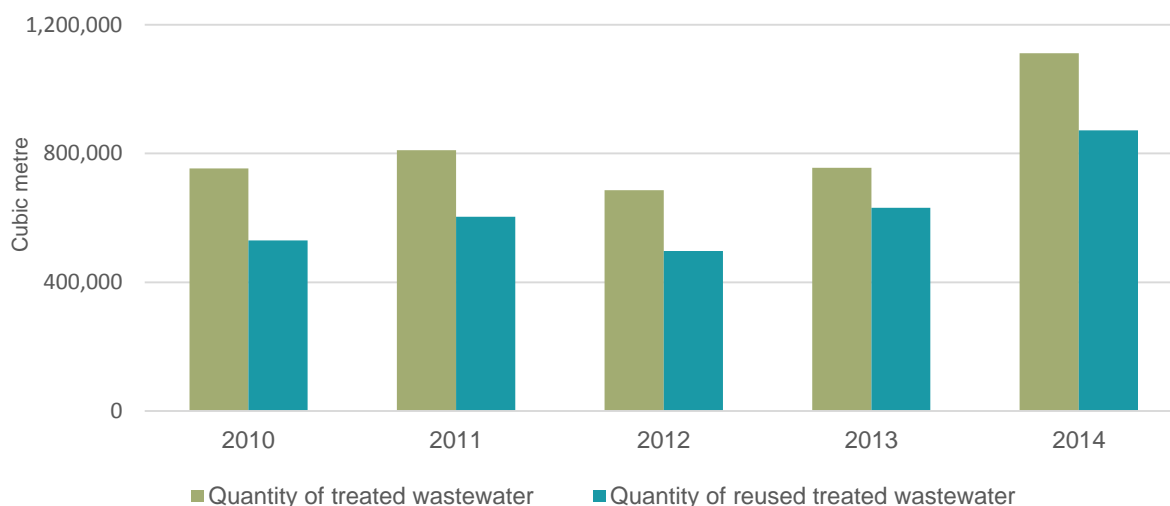
**Table 3.2: Quantities of treated wastewater and reused treated wastewater in industrial sector**

Cubic metre

| Item                                  | 2010    | 2011    | 2012    | 2013    | 2014      |
|---------------------------------------|---------|---------|---------|---------|-----------|
| Quantity of treated wastewater        | 753,700 | 809,952 | 686,413 | 755,418 | 1,111,902 |
| Quantity of reused treated wastewater | 530,138 | 603,470 | 497,650 | 631,437 | 872,236   |

Source: Statistics Centre– Abu Dhabi

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



Source: Statistics Centre– Abu Dhabi



## Energy Consumption statistics

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

In 2014, the total amount of energy consumed in the Emirate of Abu Dhabi in the five economic activities shown in table 4.1 totaled around 1.5 Million Billion British Thermal Units, as well as total amount of electrical power consumed around 92 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 57%, followed by the services activity with a 19%, and the least electricity consumption goes to the transportation and storage activity with a 2% from the total amount of produced electricity consumption from all five economic activities.

Total amount of natural gas produced got 1,186 Thousand Billion British Thermal Units; Total amount Energy consumption in the industrial activity reached 63% from total consumption of energy from all economic activities, where industrial activity is depends mainly on natural gas by 90%; however, this consumption includes electric power production. Figure 4.2 displays percentages of fossil fuels consumption by economic activity.

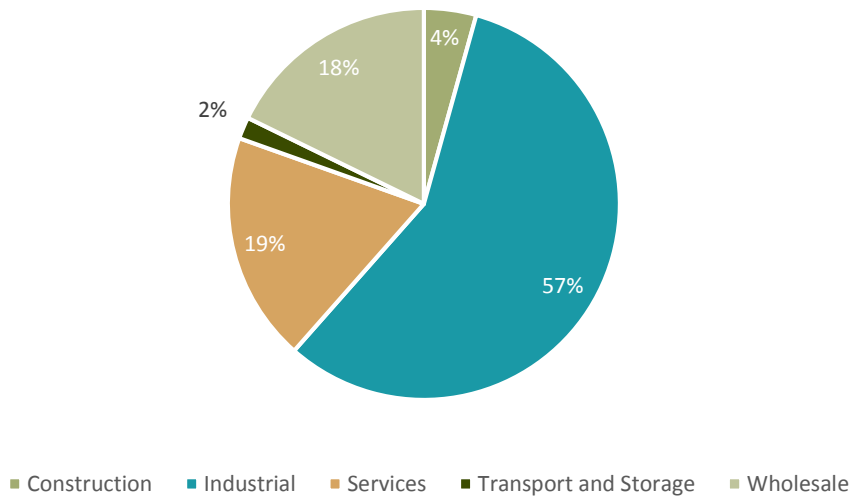
**Table 4.1: Amount of Fuel consumed by type and economic activity - 2014**

BBTU

| Type               | Total            | Construction  | Industrial     | Services       | Transport and storage | Trade         |
|--------------------|------------------|---------------|----------------|----------------|-----------------------|---------------|
| Electricity        | 91,760           | 3,960         | 52,479         | 17,365         | 1,655                 | 16,301        |
| Gasoline           | 51,202           | 4,335         | 6,256          | 11,199         | 22,210                | 7,202         |
| Diesel             | 58,258           | 22,859        | 20,462         | 3,435          | 7,519                 | 3,983         |
| Kerosene           | 138,439          | -             | 14             | -              | 138,425               | -             |
| Natural Gas        | 1,186,146        | 1,356         | 752,823        | 431,796        | 171                   | 0             |
| <b>Grand Total</b> | <b>1,525,805</b> | <b>32,510</b> | <b>832,034</b> | <b>463,795</b> | <b>169,980</b>        | <b>27,486</b> |

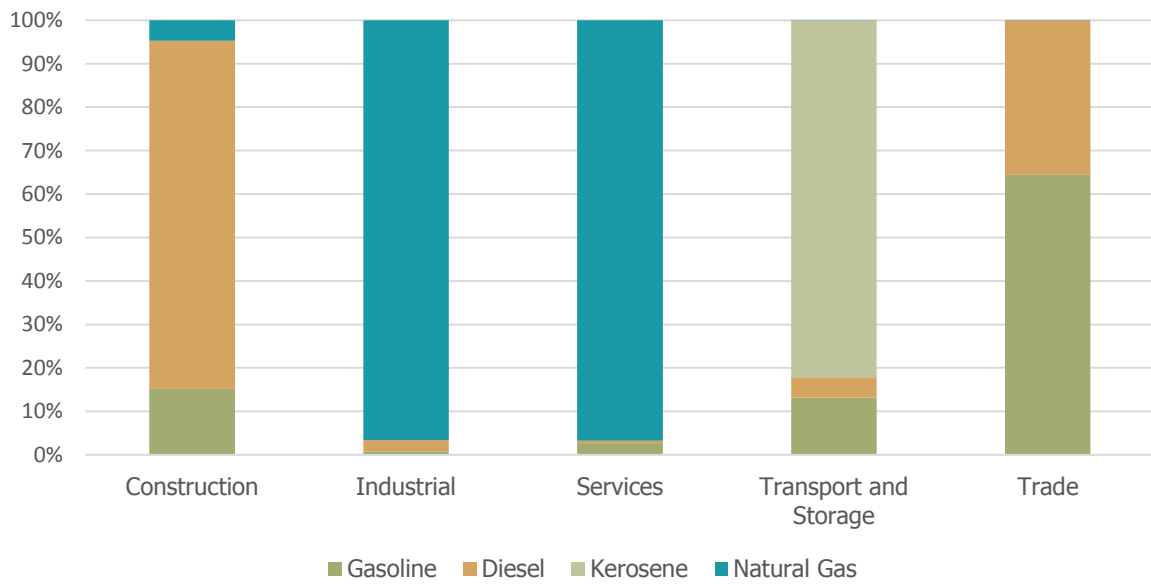
Source: Statistics Centre– Abu Dhabi

**Figure 4.1: Percentage of electricity consumption by economic activity - 2014**



Source: Statistics Centre– Abu Dhabi

**Figure 4.2: Percentage of fuel consumed by economic activity – 2014**

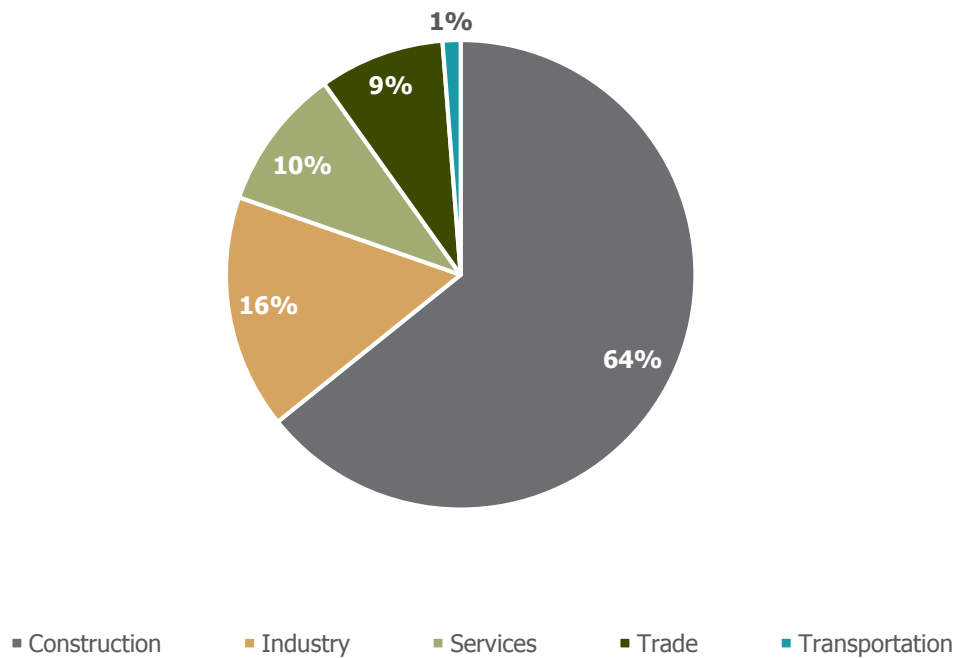


Source: Statistics Centre– Abu Dhabi

## 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 2014, total amount of non-hazardous solid waste generated weighed 2,093 thousand tons. Figure 5.1 shows the percentage distribution of total non-hazardous waste produced that the industrial and construction activities produced 64% and 16% respectively, with transportation and storage showing the lowest waste production percentage 1%.

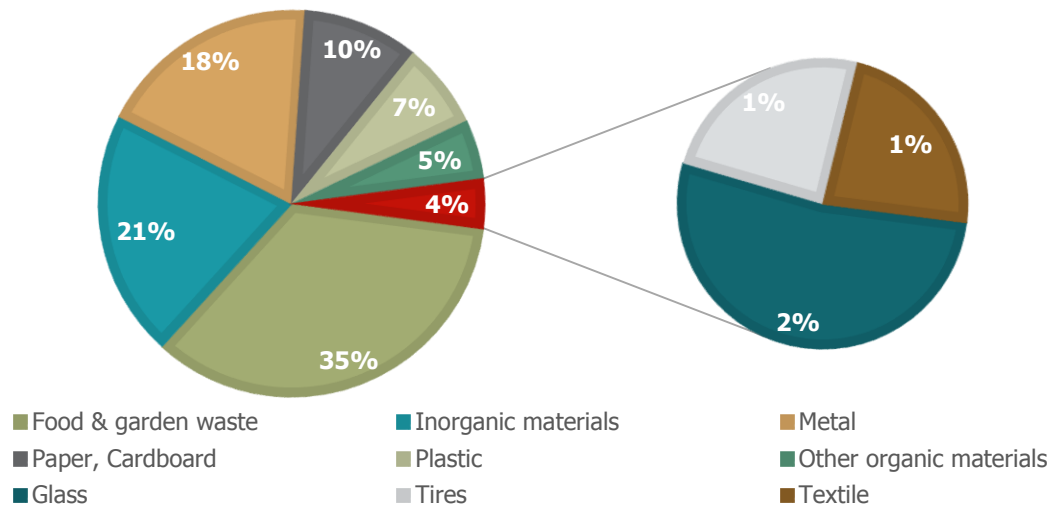
**Figure 5.1: Percentage distribution of non-hazardous solid waste by economic activity - 2014**



Source: Statistics Centre– Abu Dhabi

The results of the study revealed that the largest component of non-hazardous solid waste in 2014 is organic materials of food and garden waste with 35%, and 5% of other organic materials waste from entire non-hazardous waste generation from five economic activities. Tires, textiles and glass waste constituted the lowest proportion of solid waste as illustrated in figure 5.2.

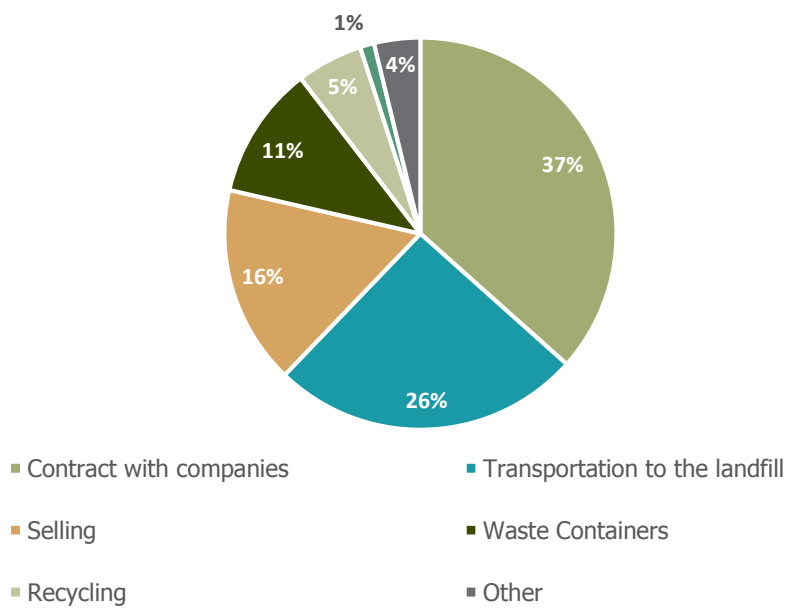
**Figure 5.2: Percentage distribution of non-hazardous solid waste (organic-inorganic) solid waste by composition – 2014**



Source: Statistics Centre– Abu Dhabi

Figure 5.3 shows the percentage distribution of waste by disposal method; data reveals that 26% of the total solid waste generated was in waste containers. Percentage of waste disposed through the contract concluded with other companies was 37%, while waste incineration noted 1%, which was the lowest compared with the other waste disposal methods.

**Figure 5.3: Percentage distribution of solid waste by disposal method – 2014**



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 not provided by the available administrative data sets.

### 2. Statistical Units and Classifications

Data 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. **Industrial activity. Includes:**
  - Mining and quarrying.
  - Manufacturing.
  - Electricity, gas, steam and air conditioning supply.
  - Water supply; sewage, waste management and remediation activities.
2. **Construction activity.**
3. **Trade activity. It includes:**
  - Wholesale and retail trade; repair of motor vehicles and motorcycles.
4. **Transportation and storage activity.**
5. **Services activity. 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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