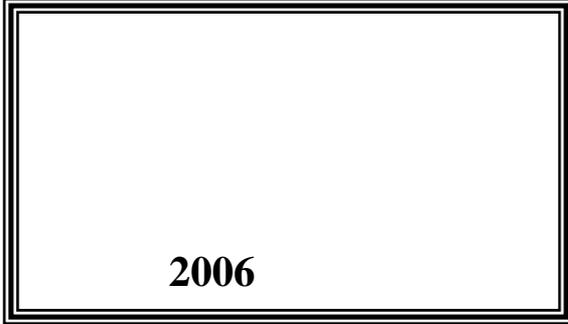


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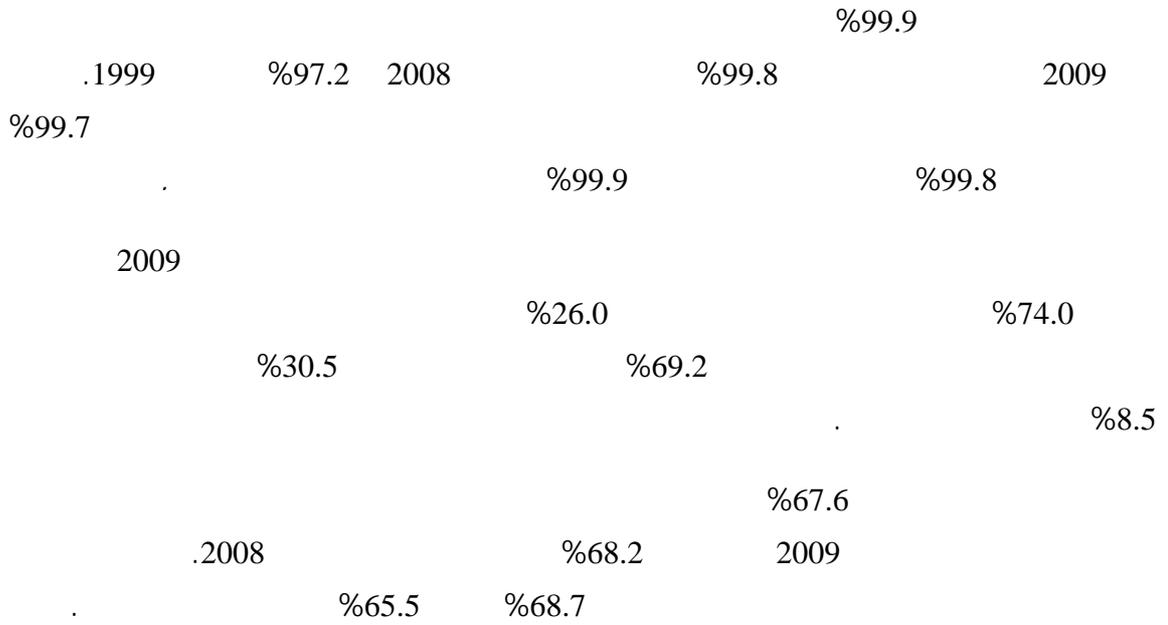
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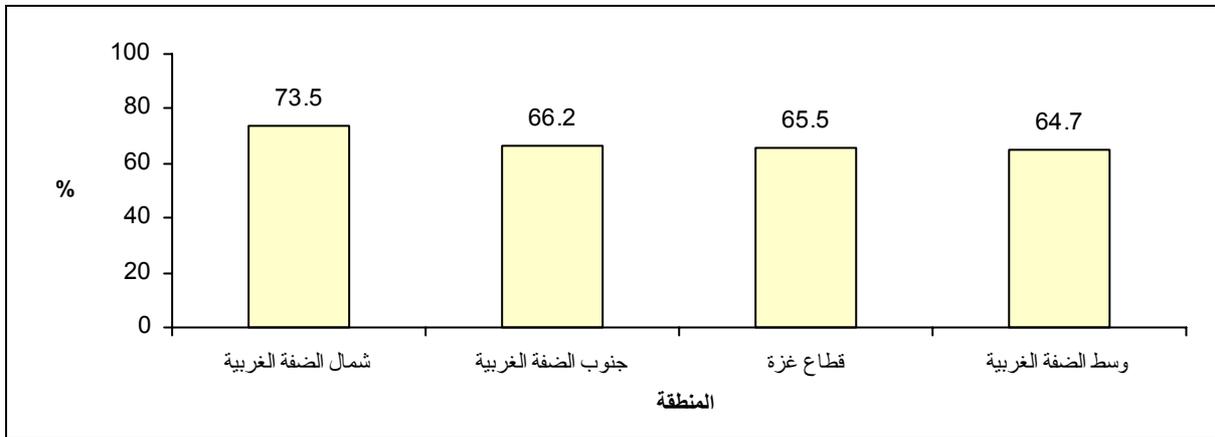
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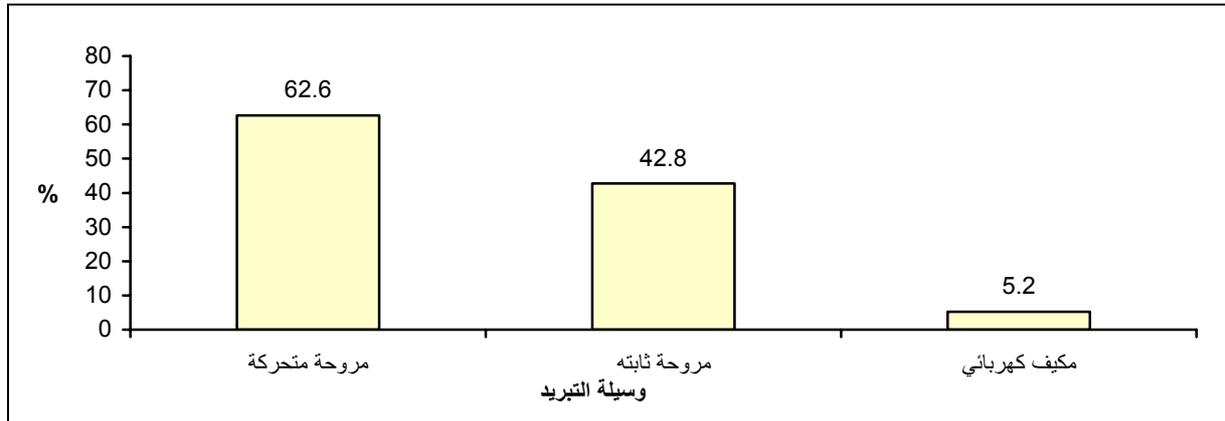
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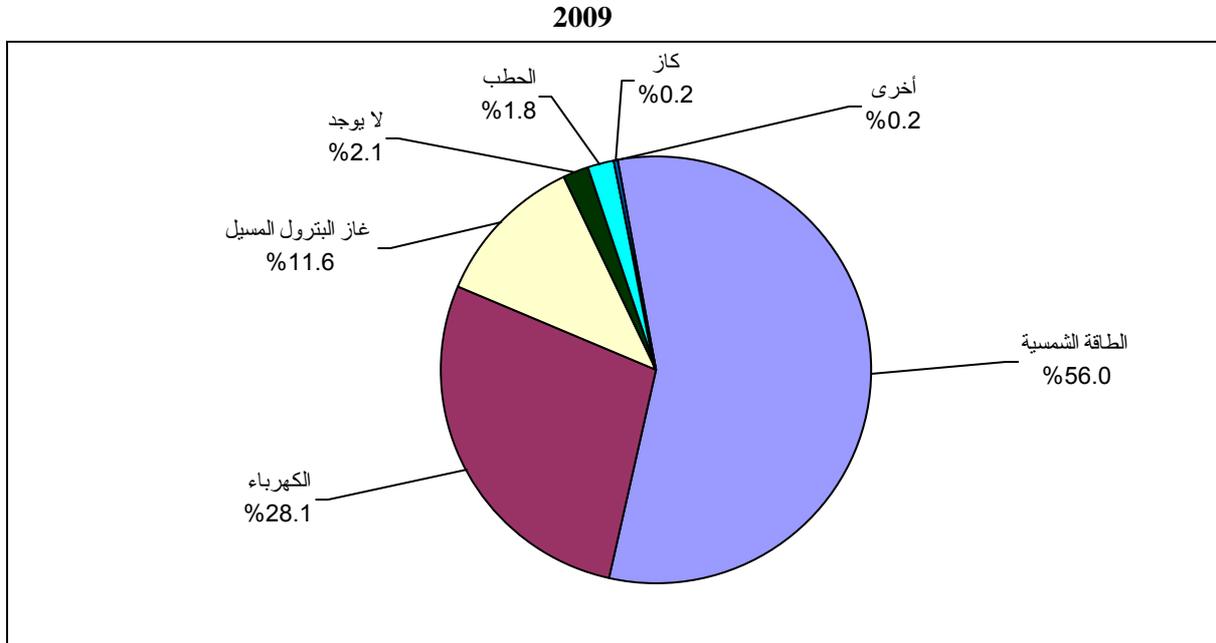
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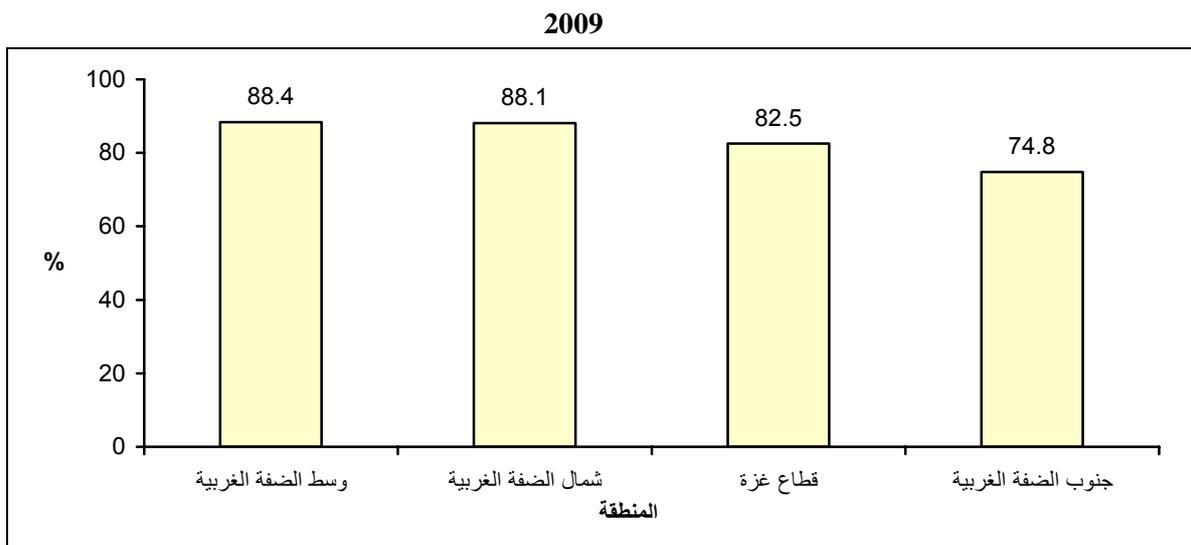
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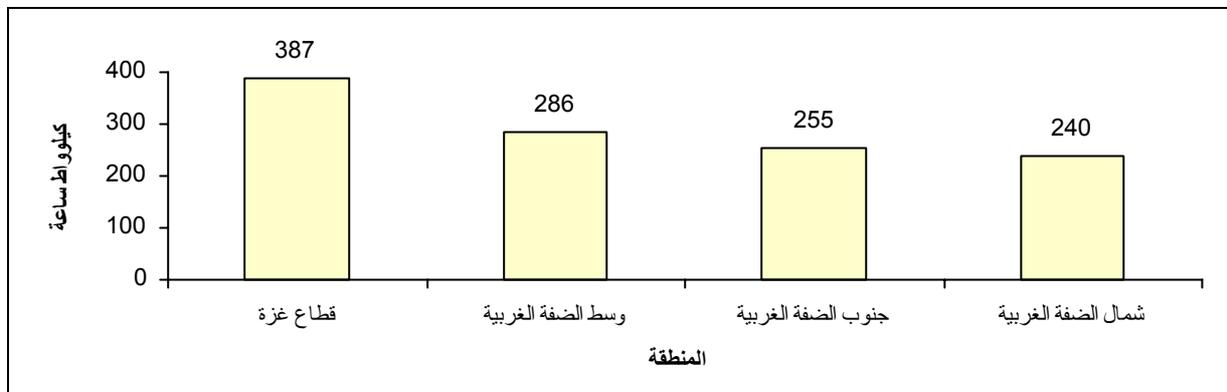
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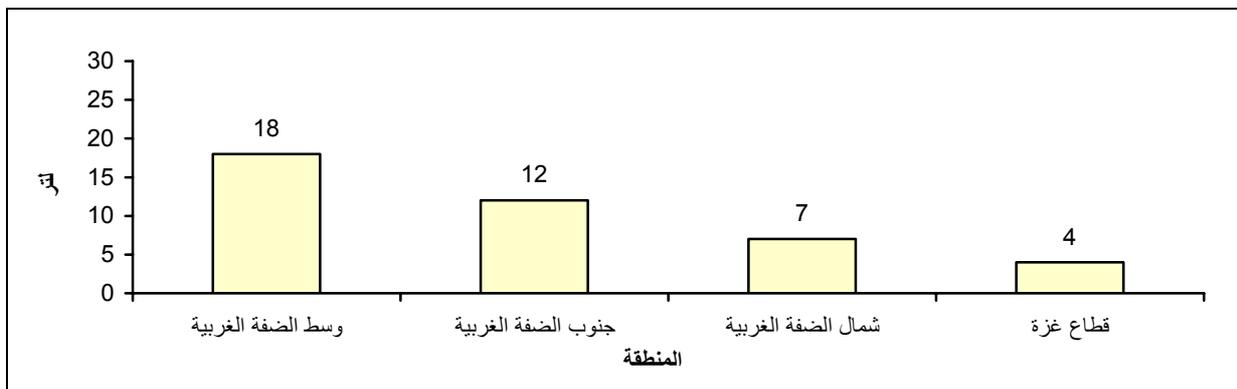
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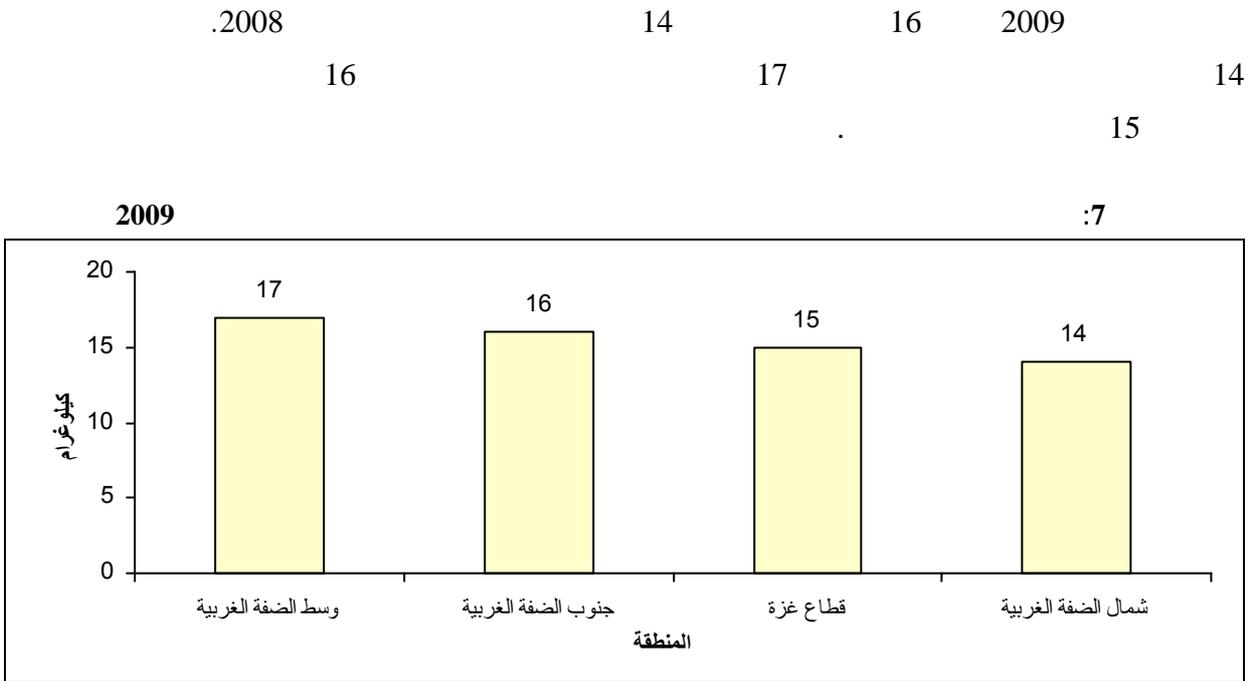


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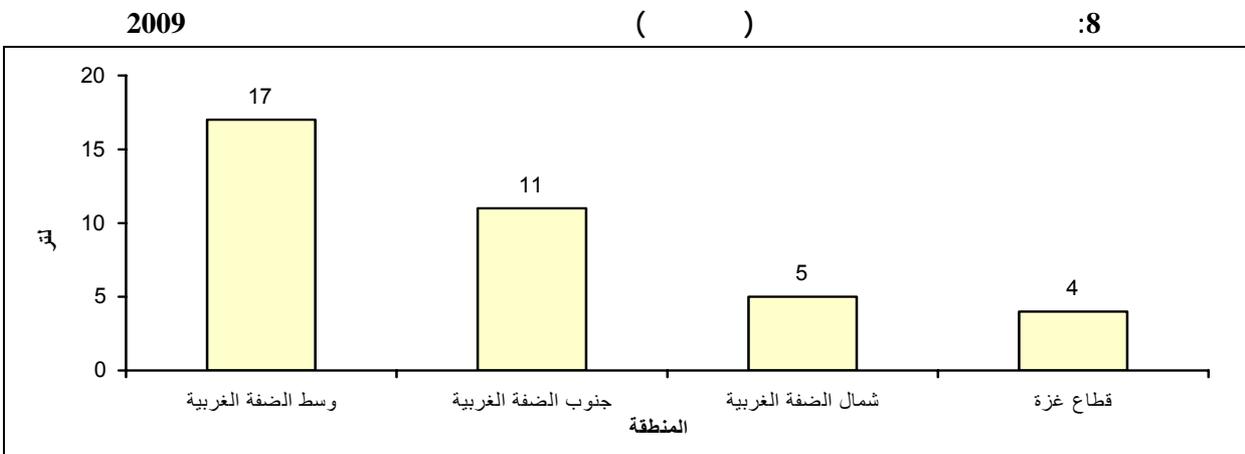
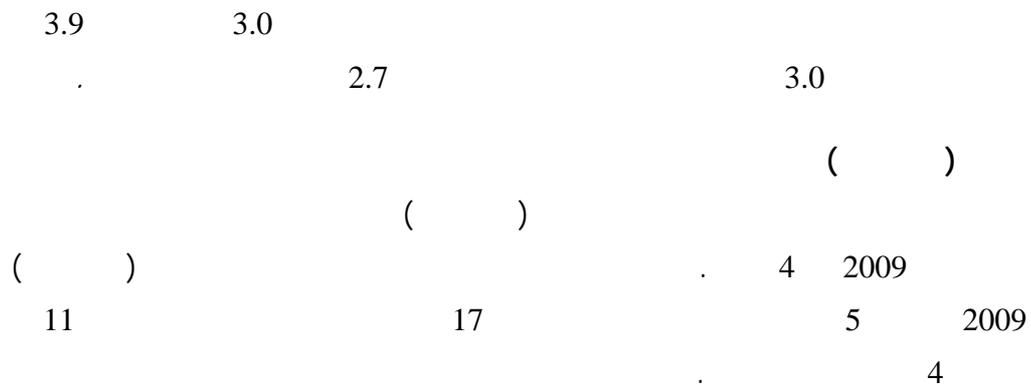
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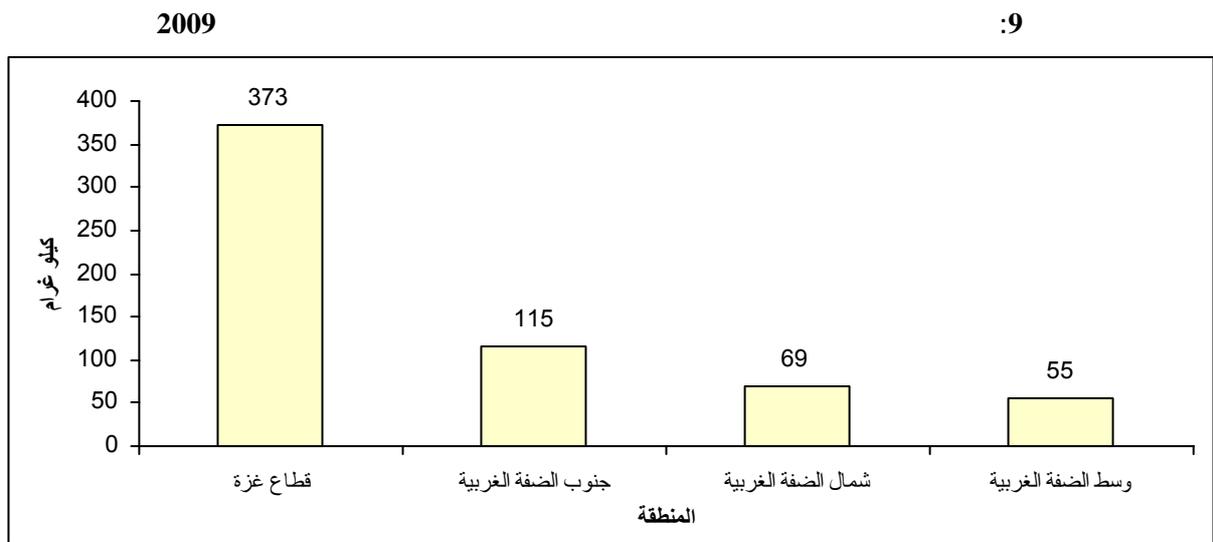




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Tables

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Table 1: Household Energy Indicators in the Palestinian Territory, July 1999, 2001, 2003 - 2006, 2008, 2009

Indicator	Year							
	2009	2008	2006	2005	2004	2003	2001	1999
Percent of Households Connected to the Electricity Public Network	99.9	99.8	99.5	99.6	99.5	99.4	99.1	97.2
Percent of Households Using Solar Heater	67.6	68.2	69.2	69.2	71.2	71.2	72.5	68.0
Percent of Households Using Space Conditioning Facilities	83.1	79.7	78.7	80.0	80.7	79.6	78.0	..
Percent of Households Using Gas Burner for Cooking	99.3	..	98.8	99.1	99.7	99.6	99.4	99.1
Average Household Consumption of Electricity (KW.h)	247	271	227	264	264	274	272	380
Average Household Consumption of LPG (Kg)	16	14	17	18	20	20	21	21
Average Household Consumption of Kerosene (Liter)	4	10	4	3	3	4	1	1

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Table 2: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Electricity Source in Housing Unit, July 2009

Region	Main Electricity Source in the Housing Unit		
	Total	No Electricity	Public Network
Palestinian Territory	100	0.1	99.9
West Bank	100	0.1	99.9
North of West Bank	100	0.2	99.8
Middle of West Bank	100	0.1	99.9
South of West Bank	100	0.3	99.7
Gaza Strip	100	0.1	99.9

2009

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Table 3: Percentage Distribution of Households in the Palestinian Territory by Region and Type of Electricity Meter Used, July 2009

Region	Type of Electricity Meter Used		
	Total	Prepayment Meter	Normal Meter
Palestinian Territory	100	26.0	74.0
West Bank	100	39.4	60.6
North of West Bank	100	69.2	30.8
Middle of West Bank	100	8.5	91.5
South of West Bank	100	30.5	69.5
Gaza Strip	100	0.0	100.0

2009

:4

Table 4: Percentage Distribution of Households in the Palestinian Territory by Region and Number of Hours of Electricity Service, July 2009

Region	Number of Hours of Electricity Service			
	Total	24 ساعة 24 Hours	17-23 ساعة 17-23 Hours	أقل من 16 ساعة Less Than 16 Hours
Palestinian Territory	100	65.7	10.1	24.2
West Bank	100	99.6	0.0	0.4
North of West Bank	100	99.1	0.0	0.9
Middle of West Bank	100	99.7	0.1	0.2
South of West Bank	100	100.0	0.0	0.0
Gaza Strip	100	0.0	29.6	70.4

2009

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Table 5: Percentage Distribution of Households in the Palestinian Territory by Region and Using Solar Heater, July 2009

Region	Using Solar Heater in the Housing Unit		
	Total	Not Using	Using
Palestinian Territory	100	32.4	67.6
West Bank	100	31.3	68.7
North of West Bank	100	26.5	73.5
Middle of West Bank	100	35.3	64.7
South of West Bank	100	33.8	66.2
Gaza Strip	100	34.5	65.5

2009

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Table 6: Percentage of Households in the Palestinian Territory by Region and Conditioning Facility Used, July 2009

Region	Conditioning Facility ()		
	Mobile Fan	Fixed Fan	Electrical Conditioner
Palestinian Territory	62.6	42.8	5.2
West Bank	72.7	34.5	6.6
North of West Bank	77.8	53.5	5.1
Middle of West Bank	72.9	27.2	11.8
South of West Bank	65.5	15.6	3.0
Gaza Strip	42.8	58.9	2.4

2009

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Table 7: Percentage Distribution of Households in the Palestinian Territory by Region and Cooking Facility Used, July 2009

Region	Cooking Facility				
	Total	Kerosene Burner	Wood Burner	Gas Burner	Electrical Oven
Palestinian Territory	100	0.1	0.4	99.3	0.2
West Bank	100	0.0	0.5	99.4	0.1
North of West Bank	100	0.0	0.1	99.9	0.0
Middle of West Bank	100	0.0	0.3	99.7	0.0
South of West Bank	100	0.0	1.3	98.3	0.4
Gaza Strip	100	0.1	0.3	99.3	0.3

2009

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Table 8: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Fuel Used for Cooking, July 2009

Region	Main Fuel Used for Cooking					
	Total	Not Available	Kerosene	Electricity	Wood	LPG
Palestinian Territory	100	0.3	0.0	0.2	0.4	99.1
West Bank	100	0.4	0.0	0.1	0.5	99.0
North of West Bank	100	0.0	0.0	0.0	0.1	99.9
Middle of West Bank	100	0.1	0.0	0.0	0.3	99.6
South of West Bank	100	1.4	0.0	0.4	1.3	96.9
Gaza Strip	100	0.0	0.1	0.3	0.3	99.3

2009

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Table 9: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Fuel Used for Baking, July 2009

Region	Main Fuel Used for Baking					
	Total	Not Available	Others	Wood	LPG	Electricity
Palestinian Territory	100	41.2	1.7	14.9	13.3	28.9
West Bank	100	56.6	2.6	12.0	18.4	10.4
North of West Bank	100	59.9	1.2	17.3	18.0	3.6
Middle of West Bank	100	70.8	0.1	9.9	10.7	8.5
South of West Bank	100	36.7	7.4	6.7	27.1	22.1
Gaza Strip	100	11.4	0.0	20.6	3.4	64.6

2009

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Table 10: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Fuel Used for Water Heating, July 2009

Region	Main Fuel Used for Water heating							
	Total	Not available	Others	Kerosene	Wood	LPG	Solar Energy	Electricity
Palestinian Territory	100	2.1	0.2	0.2	1.8	11.6	56.0	28.1
West Bank	100	3.1	0.2	0.0	1.4	11.2	51.2	32.9
North of West Bank	100	5.2	0.0	0.0	1.4	7.6	33.2	52.6
Middle of West Bank	100	1.9	0.1	0.0	0.7	8.8	62.5	26.0
South of West Bank	100	1.4	0.7	0.1	2.3	18.7	64.3	12.5
Gaza Strip	100	0.2	0.1	0.6	2.6	12.4	65.4	18.7

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Table 11: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Fuel Used for Conditioning, July 2009

Region	Main Fuel Used for Conditioning ()		
	Total	Not Available	Electricity
Palestinian Territory	100	16.3	83.7
West Bank	100	15.6	84.4
North of West Bank	100	11.9	88.1
Middle of West Bank	100	11.6	88.4
South of West Bank	100	25.2	74.8
Gaza Strip	100	17.5	82.5

2009

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Table 12: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Fuel Used for Lighting, July 2009

Region	Main Fuel Used for Lighting		
	Total	Others	Electricity
Palestinian Territory	100	0.2	99.8
West Bank	100	0.2	99.8
North of West Bank	100	0.2	99.8
Middle of West Bank	100	0.1	99.9
South of West Bank	100	0.6	99.4
Gaza Strip	100	0.1	99.9

2009

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Table 13: Percentage of Households that Use Energy in the Palestinian Territory by Region, Type of Locality and Energy Type, July 2009

Region and Type of Locality	Energy Type				
	Kerosene	LPG	Solar Energy	Wood	Electricity
Palestinian Territory	9.0	99.1	67.6	17.9	99.9
Urban	10.2	99.0	67.3	17.7	99.9
Rural	0.7	99.7	71.3	24.1	99.9
Camps	14.6	98.8	63.0	7.3	99.9
West Bank	0.7	99.0	68.7	13.9	99.9
North of West Bank	0.4	99.8	73.5	17.6	99.8
Middle of West Bank	1.4	99.7	64.7	10.4	99.9
South of West Bank	0.5	97.0	66.2	12.4	99.7
Gaza Strip	25.0	99.4	65.5	25.6	99.9

2009

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Table 14: Average Household Consumption of Electricity, Petroleum Products and Wood in the Palestinian Territory by Region, July 2009

Region	Average Household Consumption of Electricity, Petroleum Products and Wood					
	() Diesel (Liter)	() Gasoline (Liter)	() Kerosene (Liter)	() LPG (Kg)	() Wood (kg)	() Electricity (KWh)
Palestinian Territory	3	9	4*	16	222	247
West Bank	5	12	14	16	78	243
North of West Bank	2	7	5	14	69	240
Middle of West Bank	11	18	17	17	55	286
South of West Bank	3	12	11	16	115	255
Gaza Strip	1	4	4	15	373	387

*The percent of households that use Kerosene in the West Bank is 5% from the total number of households that use Kerosene in the Palestinian Territories, and this average does not affect the average consumption in the Palestinian Territories.

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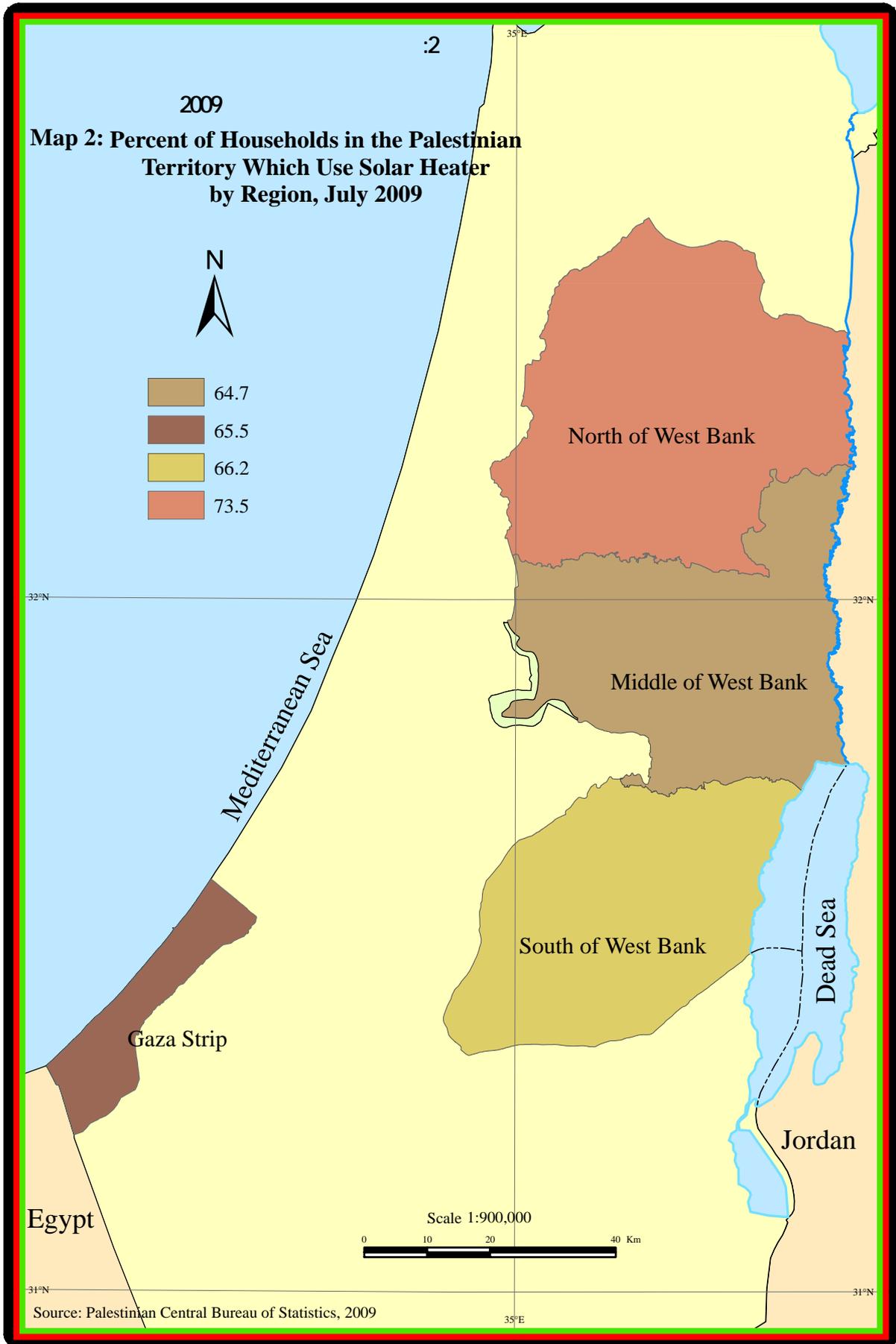
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Table 15: Average Consumption Per Capita of Electricity, Petroleum Products and Wood in the Palestinian Territory by Region, July 2009

Region	Average Consumption Per Capita of Electricity, Petroleum Products and Wood			
	() Kerosene (Liter)	() LPG (Kg)	() Wood (kg)	() Electricity (KWh)
Palestinian Territory	0.8	3.1	33.4	49.6
West Bank	3.5	3.3	12.9	49.7
North of West Bank	0.9	3.0	12.4	49.4
Middle of West Bank	4.7	3.9	10.0	69.5
South of West Bank	2.4	3.0	16.6	48.9
Gaza Strip	0.7	2.7	54.9	49.1

Maps







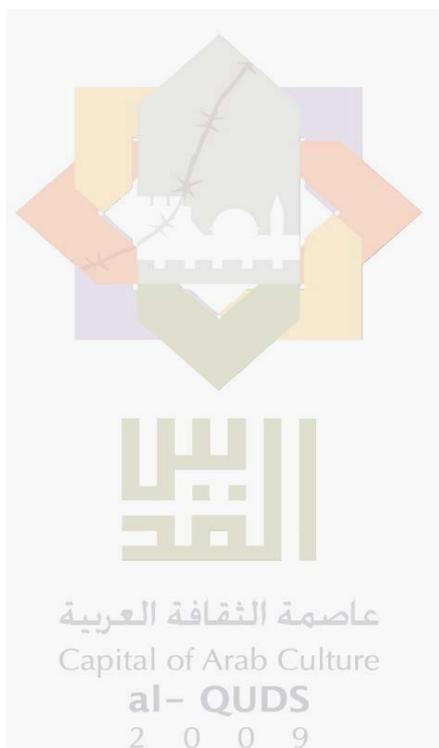
**Palestinian National Authority
Palestinian Central Bureau of Statistics**

**Household Energy Survey: Main Results
(July, 2009)**

December, 2009

“Cover Price 5 US\$”

PAGE NUMBERS OF ENGLISH TEXT ARE PRINTED IN SQUARE BRACKETS.
TABLES ARE PRINTED IN THE ARABIC ORDER (FROM RIGHT TO LEFT)



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The funding for this survey was provided by the Palestinian National Authority (PNA) and the Core Funding Group (CFG) for 2009. CFG members include the Representative Office of Norway to the PNA; the Representative Office of Netherlands to PNA; and the Swiss Agency for Development and Cooperation (SDC).

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Acting President

Preface

Most countries give special attention to providing statistics on energy due to its important role in reflecting the situation of infrastructure, the economy and the level of living standards of a society. In Palestine, additional special attention is given to energy statistics due to the shortage of natural resources, the high cost of energy and the high population density. All of these factors create a need for comprehensive and high quality statistics in this field of study.

In view of the attention on providing statistical data on household activities, which were found to be the highest energy-consuming sector, PCBS decided to conduct a special Household Energy Survey to provide high quality data about energy consumption by type, different energy consuming facilities used at the household level, and the behavior of this important sector.

PCBS conducts the Household Energy Survey twice a year. This survey was conducted during the period 23/08/2009 to 01/10/2009 to cover July in order to know the energy consumption behavior in the summer season.

PCBS hopes that the results of this report will contribute towards providing the necessary data needed for developing the energy situation in households. In addition, PCBS hopes that this report will contribute to bridging the data gap in energy statistics and provide useful data for the main data users and decision makers.

December, 2009

**Ola Awad
Acting President**

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Executive Summary

PCBS implemented the household energy survey (July 2009). This survey collected data on household energy indicators (electricity, petroleum fuel, and other types of energy) in the household activities (cooking, baking, water heating, lighting, and conditioning). Data collection took place during the period 23/08/2009 - 01/10/2009.

The results of the survey indicated that 99.9% of housing units in the Palestinian Territory were connected to the public electricity network in July 2009. From the results, it is noted that the South of West Bank has the lowest percentage of households connected to electricity network 99.7%.

From the results, it is noted that 74.0% of households in the Palestinian Territory used a normal Electricity Meter, while 26.0% of households used a Prepayment Electricity Meter in July 2009.

The results of the survey indicate that 67.6% of households in the Palestinian Territory were utilizing solar energy by using solar energy heaters in July 2009; this percentage was 68.2% in July 2008.

The results of the survey indicated that the average household electricity consumption (from the households that used electricity) in the Palestinian Territory during July 2009 was 247 KWh, while it was 271 KWh in July 2008. It reached 387 KWh in Gaza Strip and did not exceed 240 KWh in the North of the West Bank.

The main findings of the survey indicate that the average household gasoline consumption in the Palestinian Territory during July 2009 was 9 liters. It was 18 liters in the Middle of West Bank and did not exceed 7 liters in the North of West Bank, and 4 liters in Gaza Strip.

The survey indicated that the average household liquefied petroleum gas consumption in the Palestinian Territory (from the households that used liquefied petroleum gas) during July 2009 was 16 kg; this average was 14 kg in July 2008. This average ranges by region: it reached 17 kg in the Middle of West Bank, and did not exceed 14 kg in the North of West Bank.

The main results of the survey indicate that 5.2% of households in the Palestinian Territory used an electrical conditioner for the purpose of air conditioning, 42.8% of the households used a fixed fan, and 62.6% of the households used a mobile fan in July 2009.

Chapter One

Introduction

Energy has great importance due to its role in reflecting the country's economy, the people's welfare and their living standards. In addition, energy data reflects the status of infrastructure.

In 1996, PCBS established an energy statistics program in order to develop a national plan for energy statistics and to provide data about energy in the Palestinian Territory. Taking into consideration the international recommendations of the United Nations in the field of energy and the special situation of the Palestinian Territory, energy indicators were formulated through a user-producer dialogue workshop held in March 1998. The energy statistics program implemented fifteen rounds of the household energy survey during 1999-2009.

Because of the importance of the household sector and due to its large contribution to energy consumption in the Palestinian Territory, PCBS decided to conduct a special Household Energy Survey to cover energy indicators in the household sector. To achieve this, a questionnaire was attached to the Labor Force Survey.

This survey aimed to provide data on energy consumption in the household sector and to provide data on energy consumption behavior in the society by type of energy.

This survey presents data on various energy household indicators in the Palestinian Territory, and presents statistical data on electricity and other fuel consumption for the household sector, by type of fuel for different activities (cooking, baking, conditioning, lighting, and water heating).

The household energy survey (July 2009) report consists of five chapters: the first chapter presents the survey objectives and the report structure; the second chapter describes the concepts and definitions; the third chapter briefly describes the main findings; the fourth chapter presents the methodology used in the survey, consisting of the questionnaire design, sampling design, fieldwork operations and data processing; and the last chapter includes an assessment of data quality and technical notes.

Chapter Two

Concepts and Definitions

This section presents the main concepts and definitions used to derive the main indicators of energy consumption from different sources. These concepts and definitions are based on international recommendations in the field of energy statistics, and they are the same in all subjects in Palestinian Central Bureau of Statistics. The main concepts and expressions mentioned in this report were as follows:

Household

One person or a group of persons with or without a household relationship, who live in the same housing unit, share meals and make joint provision of food and other essentials of living.

Fuel

It refers to any matter used for producing energy via thermal, chemical or nuclear interaction.

Gasoline

Gasoline is a hydrocarbon fuel used mainly in internal- combustion engines. This fuel is obtained via filtration of crude oil. The quality of this type of fuel is measured by the octane number (from 0 to 100), which points to its resistance of early burning. This number is obtained by comparing the performance of its resistance of early burning with a mixture of C^7H^{16} and C^8H^{18} . For instance, the performance of "Gasoline 95" equals the performance of a mixture of 95% C^8H^{18} and 5% C^7H^{16} .

Diesel

It is a liquid hydrocarbon fuel obtained by the distillation of crude petroleum. It is heavy oil distilled between 200°C and 380°C. Its point is always above 50°C, and its specific gravity is higher than 0.82.

Liquefied Petroleum Gas (LPG)

It is mainly used in conditioning as well as a fuel in some types of engines and as a raw material for chemical industries. Usually it is marketed in cylinder metallic packages. This gas is comprised of a mixture of gases, e.g. C^3H^8 and C^4H^{10} . It is obtained from natural gas or by fracture of crude petroleum.

Kerosene

It is medium oil distilling between 150°C and 300°C. Its specific gravity is around 0.80 and the flash point above 38°C. It is used in sectors other than aircraft transport.

Charcoal

It is a solid residue, consisting mainly of carbon, obtained by the destructive distillation of wood in the absence of air.

Olive Cake

The olive cake (jeft) is the olive solid remainder after the olive pressing. It is considered as a byproduct.

Wood

Refers to all wood used for fuel purposes.

Household Consumption

It refers to consumption by households in the different activities within households (Conditioning, Cooking, Lighting, Water heating and other activities).

Electric Energy

Work done to move an electric charge in a conductor. It is measured in kilowatt-hour.

Electric Energy = Power (KW) * Time (Hours).

Kilo Watt-Hour

Energy unit, a 1 KWh = 1000 W * 3600 Second = $3.6 * 10^6$ Watt-second

Other prefixes are used for referring to this unit, e.g. Mega which equals 10^6 , and Giga, which equals 10^9 .

Main Findings

This chapter presents the main findings of the Household Energy Survey. These results were divided into four sections: the first section introduces the results related to energy sources in the domestic sector during July 2009; the second introduces the results related to the facilities used in conditioning and cooking; the third section presents the use purposes of energy types in the different activities in the households; and the fourth presents the household and per capita consumption of the different energy types.

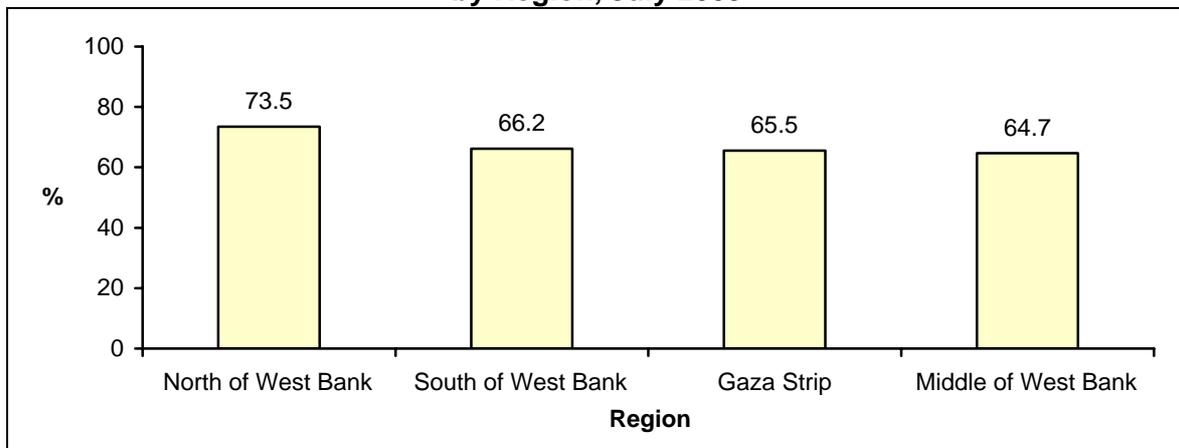
3.1 Energy Sources

The results of the survey indicate that 99.9% of housing units in the Palestinian Territory were connected to the public electricity network in July 2009.

From the results, it is noted that 74.0% of households in the Palestinian Territory used a normal Electricity Meter, while 26.0% of households used a Prepayment Electricity Meter in July 2009.

The results of the survey indicate that 67.6% of households in the Palestinian Territory were utilizing solar energy by using solar energy heaters in July 2009; this percentage was 68.2% in July 2008.

Figure 1: Percentage of Households in the Palestinian Territory Using Solar Heater by Region, July 2009

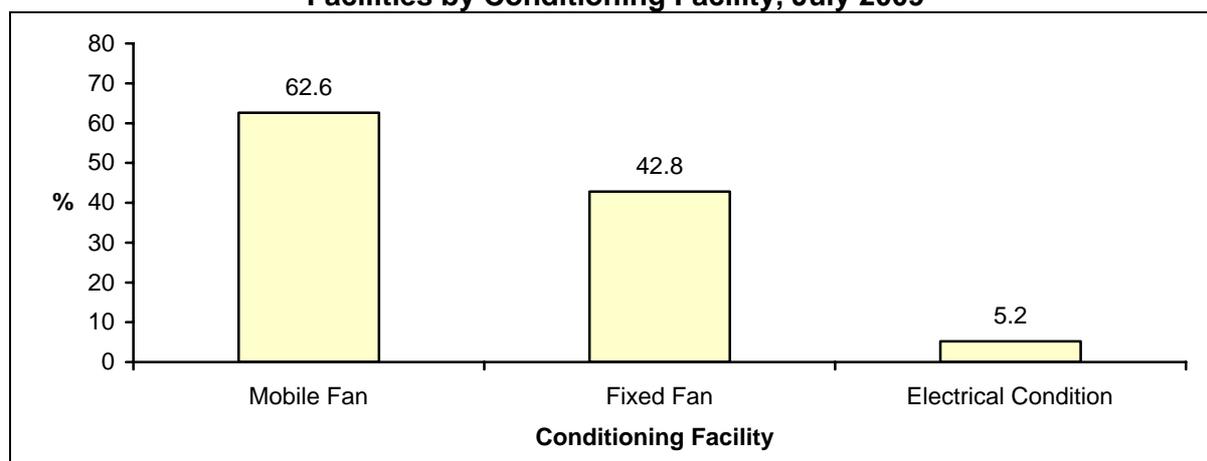


3.2 Energy Consumption Facilities

This section introduces the results on the use of conditioning and cooking facilities by households during July 2009.

The main results of the survey indicate that 5.2% of households in the Palestinian Territory used an electric conditioner for the purpose of air conditioning, 42.8% of the households used a fixed fan, and 62.6% of the households used a mobile fan in July 2009.

Figure 2: Percentage of Households in the Palestinian Territory Using Conditioning Facilities by Conditioning Facility, July 2009



The results of the survey indicate that 99.3% of households in the Palestinian Territory used gas ovens for the purpose of preparing food (cooking) in July 2009, 0.1% of the households used kerosene ovens, 0.4% of the households used wood burners, and 0.2% of the households used electrical ovens.

3.3 Energy Uses

This section presents the uses of energy types in different household activities during July 2009.

The results of the Household Energy Survey indicate that 99.1% of households in the Palestinian Territory depend on liquefied petroleum gas as a main fuel for cooking, 0.4% of households depend on wood, and 0.2% of households depend on electricity as a main fuel for cooking in July 2009.

The results of the Household Energy Survey indicate that 13.3% of households in the Palestinian Territory depend on liquefied petroleum gas as a main fuel for baking, 28.9% of households in the Palestinian Territory depend on electricity as a main fuel for baking.

The results of the survey indicate that 11.6% of households in the Palestinian Territory depend on liquefied petroleum gas as a main fuel for water heating, 56.0% of households in the Palestinian Territory depend on solar heaters and 28.1% of households in the Palestinian Territory depend on electricity as a main source for water heating in July 2009.

The results of the survey indicate that 99.8% of households in the Palestinian Territory depend on electricity as a main source for lighting in July 2009.

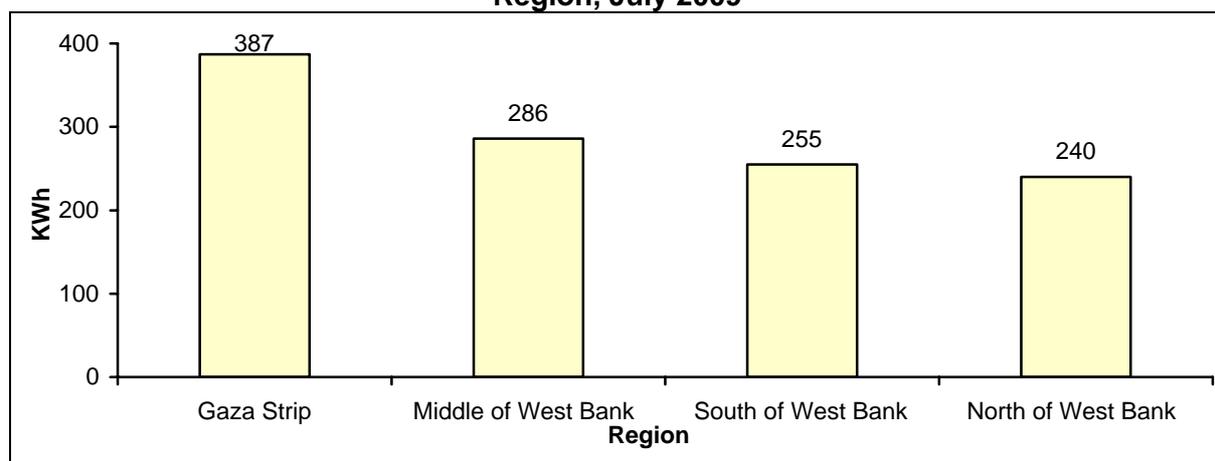
3.4 Household Energy Consumption

This section presents the main results related to household, per capita and total consumption of the different types of energy used in Palestinian Territory during July 2009.

Electricity Consumption:

The findings of the survey indicate that the average household electricity consumption in the Palestinian Territory during July 2009 was 247 KWh, while it was 271 KWh in July 2008. It reached 387 KWh in Gaza Strip and did not exceed 240 KWh in the North of the West Bank.

Figure 3: Average Household Electricity Consumption in the Palestinian Territory by Region, July 2009



The findings indicate that the average per capita electricity consumption in the Palestinian Territory during July 2009 was 49.6 KWh. It reached 49.1 KWh in Gaza Strip, and 49.7 KWh in West Bank.

Gasoline Consumption:

The findings of the survey indicate that the average household gasoline consumption in the Palestinian Territory during July 2009 was 9 liters. It was 18 liters in the Middle of West Bank and did not exceed 7 liters in the North of West Bank, and 4 liters in Gaza Strip.

Liquefied Petroleum Gas Consumption:

The findings of the survey indicate that the average household liquefied petroleum gas consumption in the Palestinian Territory during July 2009 was 16 kg; this average was 14 kg in July 2008. This average ranges by region: it reached 17 kg in the Middle of West Bank, and did not exceed 14 kg in the North of West Bank.

Kerosene Consumption:

The findings of the survey indicate that the average household kerosene consumption in the Palestinian Territory during July 2009 was 4 liters. This average ranges by region; it reached 17 liters in the Middle of West Bank, 5 liters in the North of West Bank, 11 liters in the South of West Bank and 4 liters in Gaza Strip.

Wood Consumption

The findings of the survey indicate that the average household wood consumption in the Palestinian Territory during July 2009 was 222 kg. This average ranges by region; it reached 373 kg in Gaza Strip, and 55 kg in the Middle of West Bank.

Chapter Four

Methodology

This section presents a documentation of the methodology used in preparing this report.

4.1 Questionnaire

The Household Energy Survey questionnaire was designed in accordance with similar country experience and with international standards and recommendations for the most important indicators, taking into account the special situation of the Palestinian Territory.

4.2 Sample Frame

The sample is a two-stage stratified cluster random sample.

Target Population

The target population was all Palestinian households living within the Palestinian Territory.

Sampling Frame

The sampling frame is a master sample from the overall sample that were updated in 2003 for the households that were visited a third or fourth time, while the households to be visited for the first and second time were chosen from the general frame of Population, Housing and Establishment Census 2007. It consists of a list of enumeration areas used as PSU's in the first stage of selection, and the household frame was used in the enumerator areas to choose households in the second level. The frame of the households has been updated in the enumerator areas for the new general sample at the end of year 2003.

Sampling Design

The sample of this survey is a sub-sample of the Labour Force Survey (LFS) sample, which is conducted every 13 weeks. The sample of LFS is distributed over 13 weeks. The sample of the Household Energy Survey occupies six weeks of the third quarter of 2009 of the LFS.

Stratification:

In designing the sample of the LFS, three levels of stratification were made:

1. Stratification by governorate.
2. Stratification by place of residence which comprises:
(a) Urban (b) Rural (c) Refugee camps
3. Stratification by locality size.

Sample Unit:

In the first stage, the sampling units are the enumerator areas (clusters) in the master sample. In the second stage, the sampling units are households.

Analysis Unit:

Analysis units are composed of households.

Sample Size:

The sample size is of (3,234) Palestinian households in the West Bank and Gaza Strip, where this sample has been distributed according to the locality in urban areas, in rural areas and in refugee camps.

4.3 Fieldwork

Training Fieldworkers

Fieldworkers were trained on the main skills before the start of data collection. Instructions for filling the questionnaire were made available for the interviewers. The training provides the participants with aims and definitions of the different indicators and expressions of the survey and how to fill in the questionnaire.

Data Collection

Fieldwork started on 23/08/2009 and lasted until 01/10/2009. Fieldwork teams were distributed to all districts proportional to the sample size of each governorate. The fieldwork team consisted of 24 members, including one fieldwork coordinator, 4 supervisors, 4 editors and 15 interviewers.

During fieldwork 3,234 Households were visited in the Palestinian Territory, the end results for the interview become as following:

(2,846)	Complete questionnaire
(43)	Traveling households
(19)	Housing unit not existed
(92)	Cases no body in the house
(45)	Refused cases
(130)	Housing unit abandoned
(32)	Household can't give data
(27)	Other cases

4.4 Data Processing

The data processing stage consisted of the following operations:

1. Editing and coding before data entry: All questionnaires were edited and coded in the office using the same instructions adopted for editing in the field.
2. Data entry: At this stage, data was entered into the computer using a data entry template written in Access. The data entry program was prepared to satisfy a number of requirements such as:
 - Duplication of the questionnaires on the computer screen.
 - Logic and consistency check of data entered.
 - Possibility for internal editing of question answers.
 - Maintaining a minimum of digital data entry and fieldwork errors.
 - User friendly handling.
 - Possibility of transferring data into another format to be used and analyzed using other statistical analytic systems such as SPSS.

4.5 Weight Calculation and the Estimation

Since the sampling weight is counteractive with the percentage sample from the frame, and as this ratio is different from the percentage sample for the society in the reference period, the weight was adjusted to show the total population in the middle of 2009. The weights were also adjusted to make the distribution of people in the sample by region, sort, and structure age to become identical to this distribution in the census 2007. Finally, weights were adjusted to compensate for incomplete cases that occur during data collecting.

Chapter Five

Data Quality

The concept of data quality is constructed of many aspects starting from the planning to the survey up to publishing method and understanding the data. The main principles of the statistical quality are Accuracy, Comparability, and Data Quality Assurance Procedures.

5.1 Accuracy

It includes many aspects of the survey, mainly statistical errors due to the sample, and non statistical errors referring to the workers and survey tools. It includes also the response rates in this survey and their effect on the assumptions. This section includes:

1. Sampling Errors

These types of errors evolved as a result of studying a part of the society and not all of it. Because this survey is a sample, the data of this survey will be affected by sampling errors due to using a sample and not the whole frame of the society. Differences appear compared with the actual values that could be obtained through a census. For this survey, variance calculations were made for average household consumption and total consumption for the different types of energy in the Palestinian Territory.

The results of wood, charcoal and olive cake suffers from a high variance. This problem should be taken into consideration when dealing with the average household consumption of these types of fuel, keeping in mind that there are no problems in publishing the data for the geographical level (North of the West Bank, Middle of the West Bank, South of the West Bank and Gaza Strip). However, publishing data for the governorate level is not possible due to the high variance, especially for wood, charcoal and olive cake. The variances for the main indicators of this survey are as follows:

Variable	Estimate		Standard Error	C.V %	Confidence %95 Interval	
	Unit	Value			Lower	Upper
Main Electricity Source	%	99.9	0.1	0.001	99.7	100.0
Use of Solar Heaters	%	67.6	1.4	0.020	64.9	70.2
Use of LPG	%	99.1	0.2	0.002	98.5	99.5
Average Electricity Consumption	KWh	247	5.23	0.021	237	258
Average wood Consumption	Kg	222	19.3	0.087	183	260
Average Gasoline Consumption	Liter	9	0.75	0.083	7.6	10.5

2. Non Sampling Errors

These errors are due to non-response cases as well as the implementation of surveys. In this survey, these errors emerged because of (a) the special situation of the questionnaire itself, which depends on a type of estimation, (b) diversity of sources (e.g., the interviewers, respondents, editors, coders, data entry operator, etc).

The sources of these errors can be summarized as:

1. Some of the households were not in their houses and the interviewers could not meet them.
2. Some of the households did not give attention to the questionnaire.
3. Some errors occurred due to the way the questions were asked by interviewers.
4. Misunderstanding of the questions by the respondents.
5. Answering the questions related to consumption by making estimations.

$$\text{None response rate} = \frac{\text{Sum of none response cases}}{\text{Net sample}} \times 100\%$$

$$= \frac{388}{3,234} \times 100\% = 12\%$$

$$\begin{aligned} \text{Response rate} &= 100\% - \text{none response rate} \\ &= 100\% - 12\% = 88\% \end{aligned}$$

The none response cases were treated using adjustment groups (strata) and the following equation shows this

$$fg = \frac{\sum_{ng} wi - \sum_{o.c} wi}{\sum_{rg} wi}$$

Where

$\sum_{ng} wi$ Total weights in g group

$\sum_{o.cg} wi$ Total weights over coverage

$\sum_{rg} wi$ Total weights responding in the survey

Each unit is given fg value for the interval lies in and finally we get $w'i$ using the following equation

$$w'gi = wi * fgi$$

5.2 Comparability

The data of the Household Energy Survey is comparable geographically and over time by comparing the data between different geographical areas and comparing the data of this survey with the data of previous surveys and census 2007.

5.3 Data Quality Assurance Procedures

Several measures have been made to ensure quality control in the survey, such as: the training of the fieldworkers on the main skills before the start of data collection, conducting field visits to field researchers to ensure the integrity of data collection, auditing of questionnaires before data entry, using a program that does not allow any mistakes during the process of data entry, and then examining the data. This was done to ensure that they are free from errors that were not discovered earlier, after the receipt of the raw data file, cleaning and inspection of the

anomalous values have been made, and also inspection of the harmony between the different questions on the questionnaire.

5.4 Technical Notes

This part presents the important technical notes on the indicators presented in the results of the survey:

- In all calculations related to gasoline, we dealt with the average of all available types of gasoline.
- In this survey we collected data about consumption of olive cake and coal in households, but because of lacking data and since the variance of this data is fairly high, we published this data through other entries in the tables.
- We calculated the average consumption per capita of electricity and energy types in the West Bank regions (North, Middle, and South of the West Bank) by using the average household members in the West Bank.
- According to the average household consumption of electricity, kerosene, LPG and wood, this represents the households that use these energy types.
- The increase in consumption of electricity and the decrease in the consumption of the other types of fuel in Gaza Strip reflected the last Israeli war and the Israeli siege imposed there.

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