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ENERGY PERSPECTIVE IN PALESTINE

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Energy Perspective in Palestine

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Energy planning and analysis tools are essential for deciding energy policy issues, such us security of supply, prices of fuels, sustainable development and global climate changes as well as the growing process of market liberalization. The level of involvement in these energy policies will dictate the type of economic analysis and planning models to be adopted.

However, in order to adapt energy sectors of various countries of West Asia to a wider regional policy, the definitions and classifications of energy statistical data of various countries must be consistent and consequently, an appropriate assessment of the current status of availability and reliability of such data must be investigated.

The Case of Palestine- Background

To start with, the severe swings of the political situation in Palestine, and the continuous discontinuity of even living the normal life with its basic needs, prohibit the formulation of consistent phenomenon of any kind, along with that the difficulty of having consistent energy statistics. All what is there currently are segments of data and statistical analysis which can not be relied upon as a basis for future forecasting.

However, the continuously unstable political situation in the Palestine, has reflected severely on the actual consumption of various types of Energy and made any predictions as unrealistic, for example;

- The duration of first Intifada between 1987 to 1993 and the second Intifada between 2000 and 2003 has been periods of very low energy consumption and consequently energy demand due to continuous closures and diminishing of living standards generally due to lack of resources.

- The period from 1994 to 1998 has witnessed the coming back of Palestinians from abroad to their country, with many new investments in the fields of industry and commerce , which resulted with a rise in energy consumption. This is a gain not a regular phenomenon.

- The integration of the electricity system of West Bank with the Israeli network made it difficult to have a direct data , neither of consumption nor for demand. This is because the current needs of consumers has not been fulfilled, let alone their future demands.

- In Gaza Strip, despite of the independence of the electricity grid from the Israeli grid, Israel Electric Corporation has been the source of Electricity, which has been always short of the consumers demands and not regularly supplied.

- As for other types of Energy ,it is well known that till date, areas of national authority relies 100% of its supplies on the Israeli side, these includes Diesels, Gasoline, Mazot , Liquefied Petroleum Gas (LPG) and Kerosene.

However, the possibilities of importing Energy ,in all its forms, from other sources has been restricted by "Paris Economic Agreement" which sets limitations on the quality of imported fuels (that is, it should match the Israeli Standards). Which also in turn has tied the prices of fuels for Palestinian citizens with the prices for Israeli citizens who are having multifold higher standards.

Currently, the Palestinian government is trying to modify Paris Agreement, so that Palestinians may have a wider circle for trade.

Yet, this rather dark situation had its bright spots, On one side, Natural Gas has been discovered off shore Gaza in commercial quantities and awaiting for the suitable market in order to develop the discovered fields.

No Doubt, the discovery of natural gas is going to change the fuel mix for various sectors, which in turn would depend on other factors like prices and technology used in the certain sector.

On the other hand, the construction of Gaza Power Plant is going to finish by the end of 2003, Gaza Strip will stop relying on Israel Electricity Corporation for electricity supplies, and would have its own transmission and distribution networks. However remains West Bank depending 100% on Israeli Electricity and Israeli Network.

Current Sources of Data Available

1. Energy Reports Published

In 1995, the "Palestinian master plan" has been published by PEA (currently MENR) in cooperation with the English Consultants Rust Kennedy & Donkin in 1995. the project has been financed by the World Bank.

The Consultants has carried out a comprehensive data gathering and analysis of the electricity sector in both Gaza strip and West Bank.

Load Forecast between 1995 and 2010 was carried on based on economic analysis of data gathered for the years 1972-1992.It was observed that the rate of increase in electricity consumption was approximately equal to the rate of increase in GDP. Electricity demand is thus assumed to grow at the same pace as economic growth. It was decided that there would be three economic scenarios:

a) The **Base Scenario** assumed a real growth in GDP per capita of 4% per annum.

b) The **Low Scenario** assumed no increase in GDP per capita.

c) The **High Scenario** assumed significant repatriation of Palestinian from overseas and the associated setting up of Industrial and commercial concerns. Total growth is assumed to start out at 12% per year and falling to a sustainable growth rate of 7%.

Based on above plan, a master plan for Generation, transmission and distribution was laid down, up to the year 2010.

However, The above forecast was carried out only for electricity, neglecting other types of energy for other applications.

2. Ministry of Energy and Natural Resources (MENR)

Regular reports of electricity consumption as well as consumption from other sources of fuels has been prepared by Ministry of Energy and Natural Resources (previously PEA) based on data collections from energy utilities like distribution companies and currently from the under construction Gaza Power Plant. These data has been used for short term planning and for financial consideration of the Ministry.

3. Palestinian Central Bureau of Statistics (PCBS)

Has been the source of Socio-economic data, where the data is collected monthly, quarterly and yearly.

4. Ad-Hoc group of Euro-Mediterranean Energy Forum

Recently, within the framework of Ad-Hoc group of Euro-Mediterranean Energy Forum of European Commission, A comprehensive economic analysis has been set up of the Mediterranean Partners including Palestine in order to study the national and regional development prospects in the context of a future EU-Mediterranean free trade area (FTA).

A common form for collection of Data has been set as follows:

1. Information on Energy Supply.

   A - Primary Production by Fuel (Solids, Oil, Natural Gas, Nuclear, Renewables)

   B - Imports, Exports by fuels (solids, crude Oil and feedstocks, natural gas, oil products and electricity)

   C - Gross Inland Consumption by fuel (solids, oil, natural gas and others).

   D - Renewable Energy Sources (hydro, biomass, wind, geothermal, solar and others)

   E - Fuel Inputs for Generation Electricity (solids, oil, gas and renewables)

Generation Capacity by plant (nuclear, hydro, wind-solar, geothermal and thermal)

2. Information on Energy Demand.

   A - Final Energy Demand by Fuel (solids, oil, gas, electricity and others)

   B - Final Energy Demand by Sector (electricity, industry, residential, tertiary and transport)

3. CO2 Emissions by activity sector (electricity, industry, residential, tertiary and transport)..

4. Socio-demographic data:

   A - Socio-Demographic data: demographic, employment, life quality standards.

   B - Economic data: GDP, price level, financing the economy, trade.

The data has been provided for the Ad-hoc groups for Palestine in the year 2000 as an actual data. Based on these data, the future predictions of three energy Demand Scenarios for the year 2010 and 2020 has been defined, namely, (Reference, High Low)

The data provided for the year 2000 and the predictions made by the consultants for the year 2010 are shown in the following tables.

5. Palestinian Energy Information Centre (PEIC)

In order to secure the availability and reliability of Data related to Energy sector, Ministry of Energy and Natural Resources has recently established the Palestinian Energy Information Center (PEIC) which would contribute to the identification of reliable key information sources that must be assessed.

Major Roles of PEIC:

1. It would secure the information infrastructure needed for the national center such as information management software, computers, Internet access and/web site.

2. PEIC would provide information to consumers regarding the benefits of energy efficiency. This will help overcome barriers of customer awareness that are currently inhibiting consumers from adopting cost effective energy efficiency measures.

3. Provide assistance in Energy Analysis and Forecasting.

4. Provide periodic reports on the energy sector and trends in Palestine.

5. Coordinate energy information activities with concerned stakeholders.

The staff of the PEIC will also undertake in the future the following responsibilities:

A- The inspection of the collection process for the historical data that are the core of the energy database of the system:

B. The evaluation of the data that are input to the system and the determination of the methods for the quality control of these data including cross-references between different resources;

C. The determination of a fixed procedure for the collection of data in the future, in order to achieve a constant and reliable flow of data to the energy information system.

Environmental Legislation regarding Energy Use

MENR is in the process of establishing environmental regulations regarding the energy use.

However, when the agreements of building Gaza Power Plant has been signed, the World Bank standards has been followed for various emissions from combined cycle power plants working with diesel or natural gas. These standards ar5e as follows:

NOx Emissions @ 100%	= 165 mg/Nm3 for Diesel
SOx Emissions @ Facility Load	= 45 ppm VD for Diesel with 0.2% Sulfur
Particulate @ Facility Load	= 50 mg/Nm3

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(DATA SUBMITTED TO EUROPEAN COMMISSION)

Primary Production (Mtoe)			
	2000	**2005**	**2010**
Solid Fuels			
Oil			
Natural Gas		0.64	0.86
Electricity		0.2	0.3
Biomass & waste	0.08		
Solar & other renewable	0.26		
Total	**0.34**		

Net Imports (Mtoe)			
	2000	**2005**	**2010**
Solid Fuels			
Oil	0.8	1.15	1.67
Natural Gas			
Electricity	0.19	0.05	0.04
Total	**0.99**	**1.2**	**1.71**

Gross Inland Consumption (Mtoe)			
	2000	**2005**	**2010**
Solid Fuels			
Oil	0.8	1.15	1.67
Natural Gas		0.64	0.86
Electricity	0.19	0.25	0.34
Other	0.53	0.05	0.04
Total	**1.52**	**2.09**	**2.91**

Energy Demand by Sector (Mtoe)	
	2000
Industry	0.09
Residential	0.4
Tertiary	0.11
Transport	0.42
Total	**1.02**

Socio-economic				
	Reference		**2010**	
	2000	**2010**	**HIGH**	**LOW**
Population (Million)	**3.16**	**4.93**	**6.16**	**2.67**
GDP (Billion Euro)	**4.74**	**8.81**	**11.01**	**5.81**

Primary Production (Mtoe)				
	Reference		2010	
	2000	2010	HIGH	LOW
Solid Fuels				
Oil				
Natural Gas		1.08	1.35	0.95
Renewable	0.34	0.56	0.7	0.4
Total	**0.34**	**1.64**	**2.05**	**1.35**

Net Imports (Mtoe)				
	Reference		2010	
	2000	2010	HIGH	LOW
Solid Fuels				
Oil	0.8	0.99	1.24	0.78
Natural Gas				
Electricity	0.19	0.04	0.05	0.03
Total	**0.99**	**1.03**	**1.29**	**0.81**

Gross Inland Consumption (Mtoe)				
	Reference		2010	
	2000	2010	HIGH	LOW
Solid Fuels				
Oil	0.8	0.99	1.24	0.78
Natural Gas		1.08	1.35	0.95
Other	0.53	0.6	0.75	0.43
Total	**1.33**	**2.67**	**3.34**	**2.16**

Renewable in Primary Energy (Mtoe)				
	Reference		2010	
	2000	2010	HIGH	LOW
Hydro				
Biomass (Heat Generation)	0.08	0.15	0.19	0.1
Wind				
Solar & Others	0.26	0.41	0.51	0.3
Geothermal				
Total	**0.34**	**0.56**	**0.7**	**0.4**

Electric Generation (TWh)				
	Reference		2010	
	2000	2010	HIGH	LOW
Solid Fuels				
Oil				
Natural Gas		5.3	6.36	4.07
Electricity				
Total		**5.3**	**6.36**	**4.07**

Electric Generation Capacity (GW)				
	Reference		2010	
	2000	2010	HIGH	LOW
Nuclear				
Hydro				
Wind, solar & Geothermal				
Thermal	0.05	0.9	1	0.75
Total	**0.05**	**0.9**	**1**	**0.75**

Final Energy Demand by Fuel (Mtoe)				
	Reference		2010	
	2000	2010	HIGH	LOW
Solids				
Oil	0.78	0.97	1.21	0.88
Gas				
Electricity	0.14	0.45	0.56	0.25
Other	0.1	0.56	0.7	0.42
Total	**1.02**	**1.98**	**2.47**	**1.55**

Final Energy Demand by Sector (Mtoe)				
	Reference		2010	
	2000	2010	HIGH	LOW
Industry	0.09	0.25	0.31	0.2
Residential	0.4	0.7	0.88	0.61
Tertiary	0.11	0.28	0.35	0.25
Transport	0.42	0.75	0.94	0.49
Non-energy uses				
Total	**1.02**	**1.98**	**2.48**	**1.55**

CO_2 Emissions (Mtn CO_2)				
	Reference		2010	
	2000	2010	HIGH	LOW
Electricity & Steam Production	0.02	2.65	3.31	2.5
Final Energy Demand				
Industry	0.86	1.4	1.75	1.25
Residential	0.57	1.12	1.4	1.04
Tertiary	0.25	0.48	0.6	0.45
Transport	0.92	1.4	1.75	1.3
Total	**2.62**	**7.05**	**8.81**	**6.54**