

ECE

Department of Electrical and
Computer Engineering



Overview of Electrical Energy in Palestine

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General Overview

- The energy sector situation in Palestine is highly different compared to other countries in the Middle East due to many reasons: non availability of natural resources, unstable political conditions, financial crisis and high density population.
- Furthermore, Palestine depends on other countries for 100% of its fossil fuel imports and for 87% of its electricity imports.
- In addition high growth of population, increasing living standards and rapid growth of industrial have led to tremendous energy demand in Palestine in recent years.

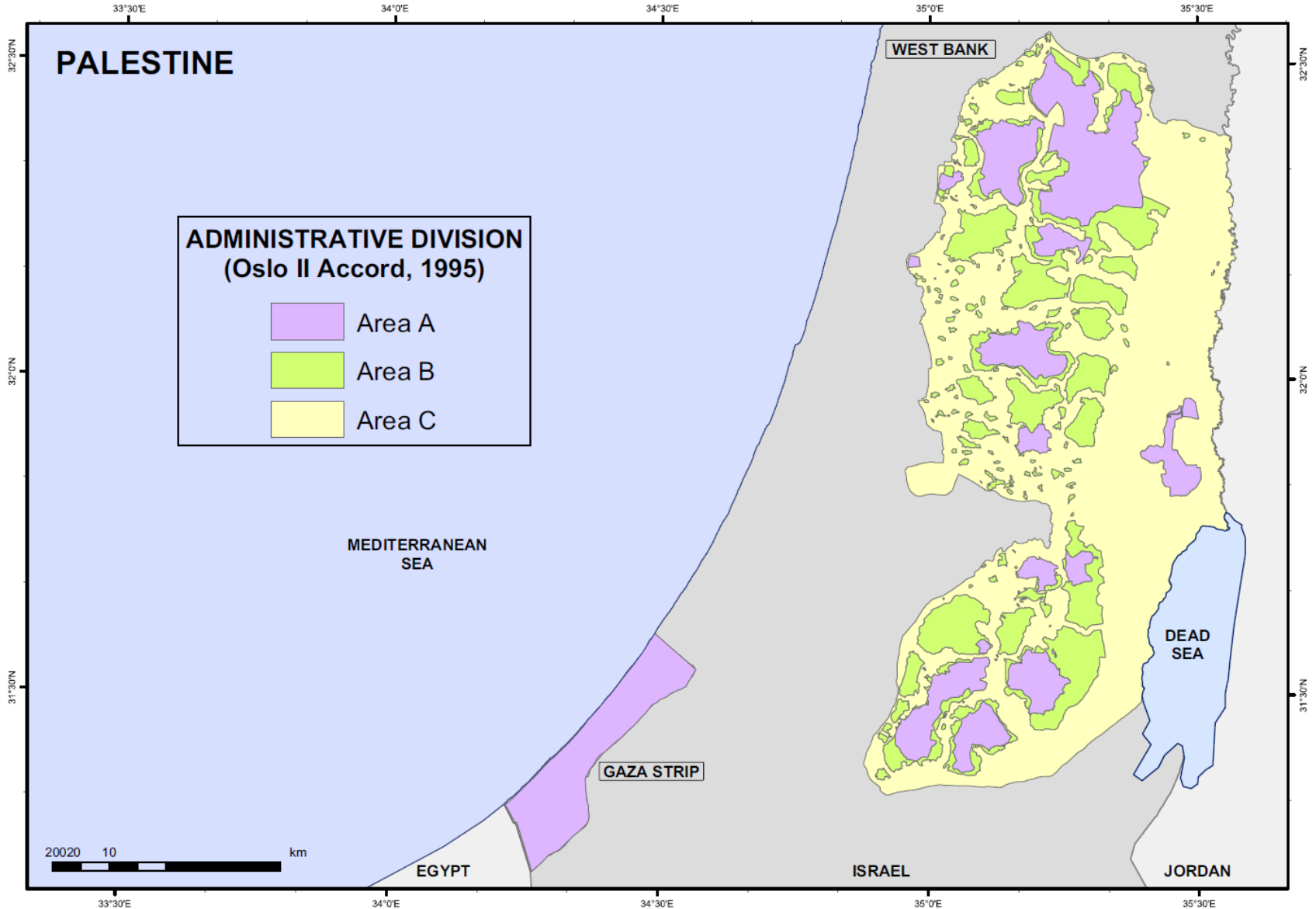
Palestinian population in 2014 by governorate

- Palestine is divided into two geographic areas: West Bank and Gaza Strip. In (2014), according to Palestinian Central Bureau of Statistics (PCBS) the population of Palestine is 4,550,368 inhabitants for an area of 6020 km², being the population density 756 people/km², distributed as follows: West Bank 494 people/km², and Gaza Strip 4822 people/km², one of the highest population density in the world.

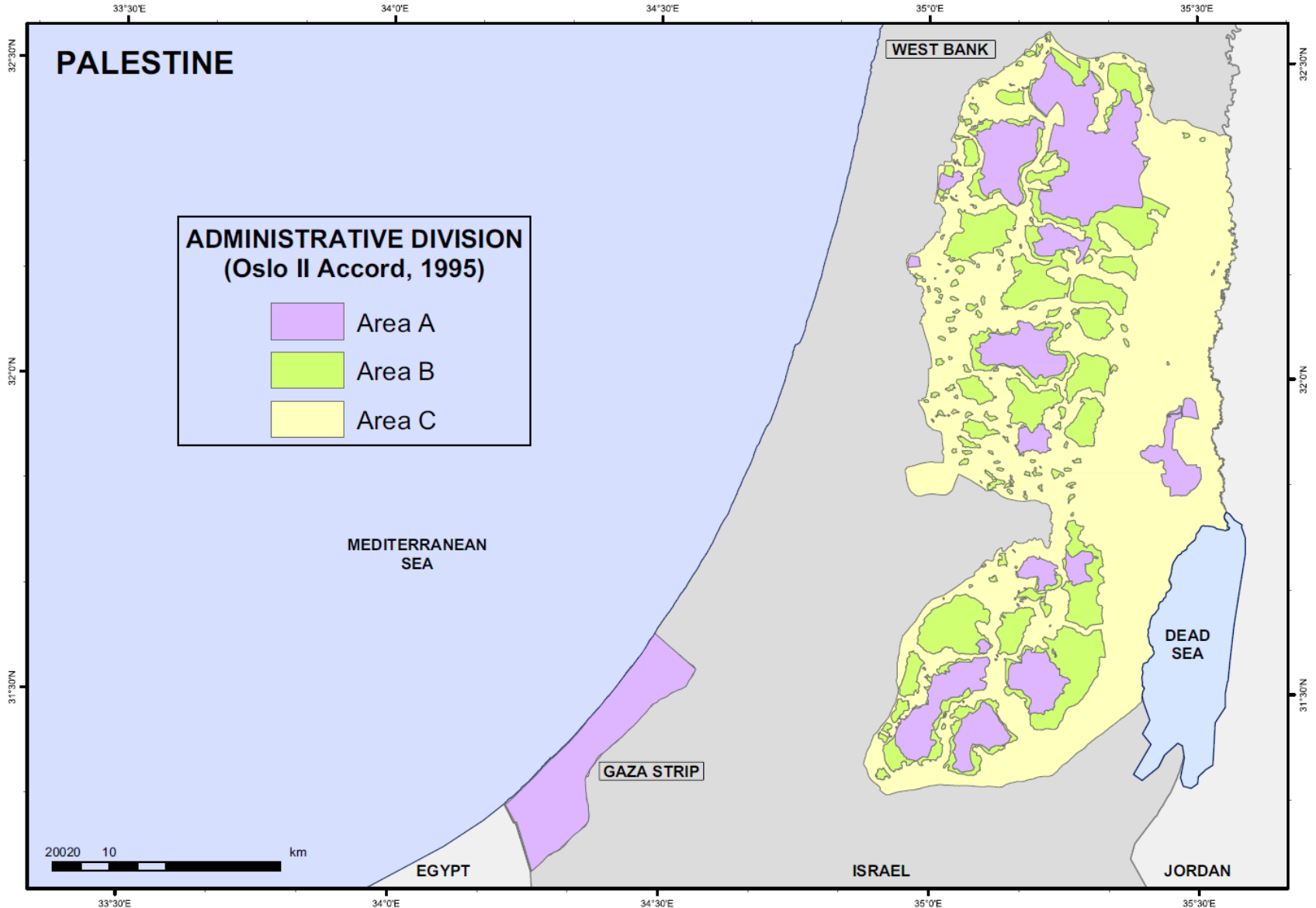
Administrative Divisions: Areas A, B and C

- The complex geographical and administrative situation of Palestine can be seen in its administrative divisions made by the Oslo II Accord in 1995, that divided West Bank into three administrative divisions: the Areas A, B and C.
- Area A indicates that full civil and security control belongs to the Palestine. Area B indicates that Palestine has civil control but security control is joint Israel and Palestine. Area C indicates that full civilian and security control is made by Israel.
- Approximately 60% of the land regions in the West Bank are classified as Area C. So, Israel control of these divisions therein severely hinders and affects the potential development of a traditional energy sector's infrastructure and regulations and policies, also hinders development initiatives

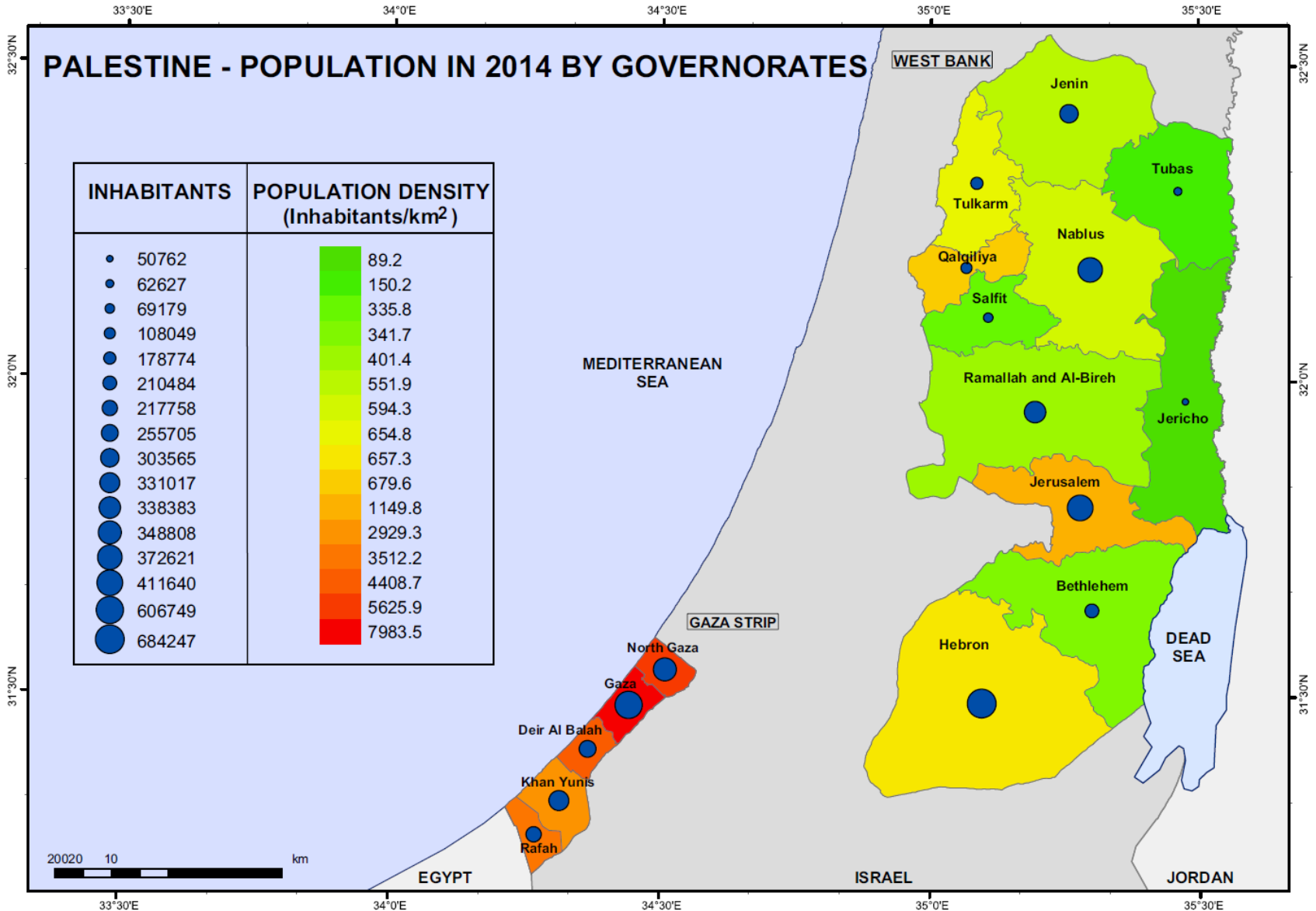
Administrative Divisions: Areas A, B and C



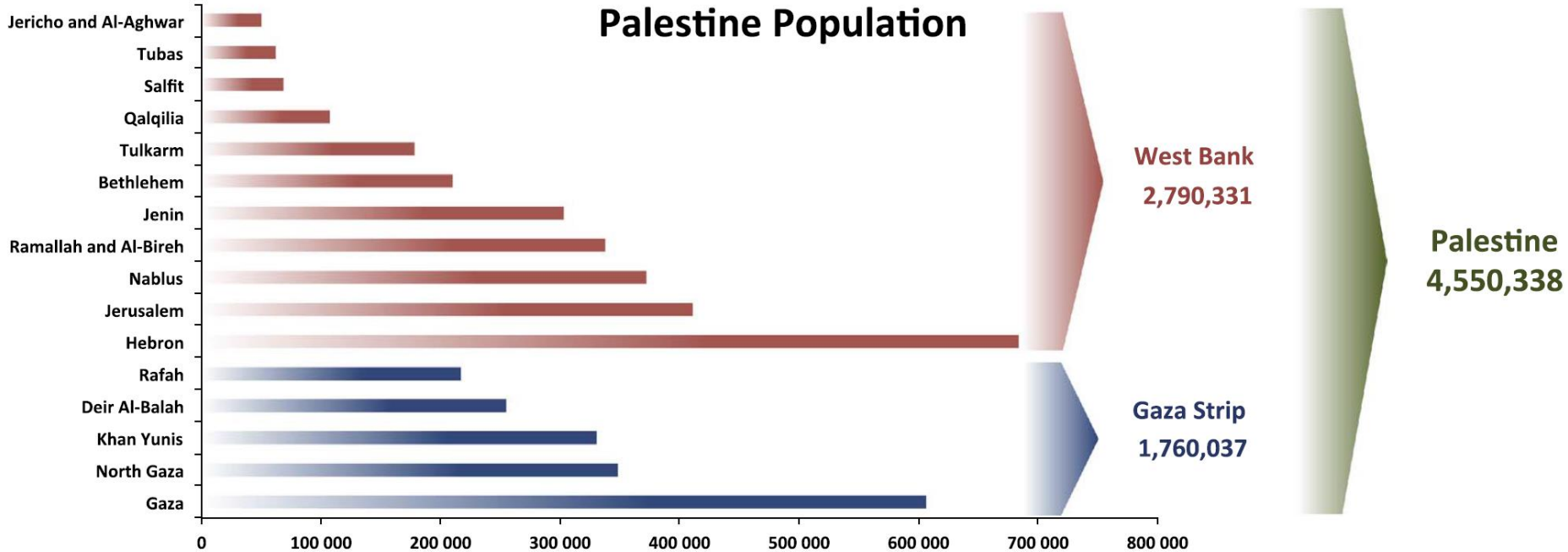
Administrative Divisions: Areas A, B and C



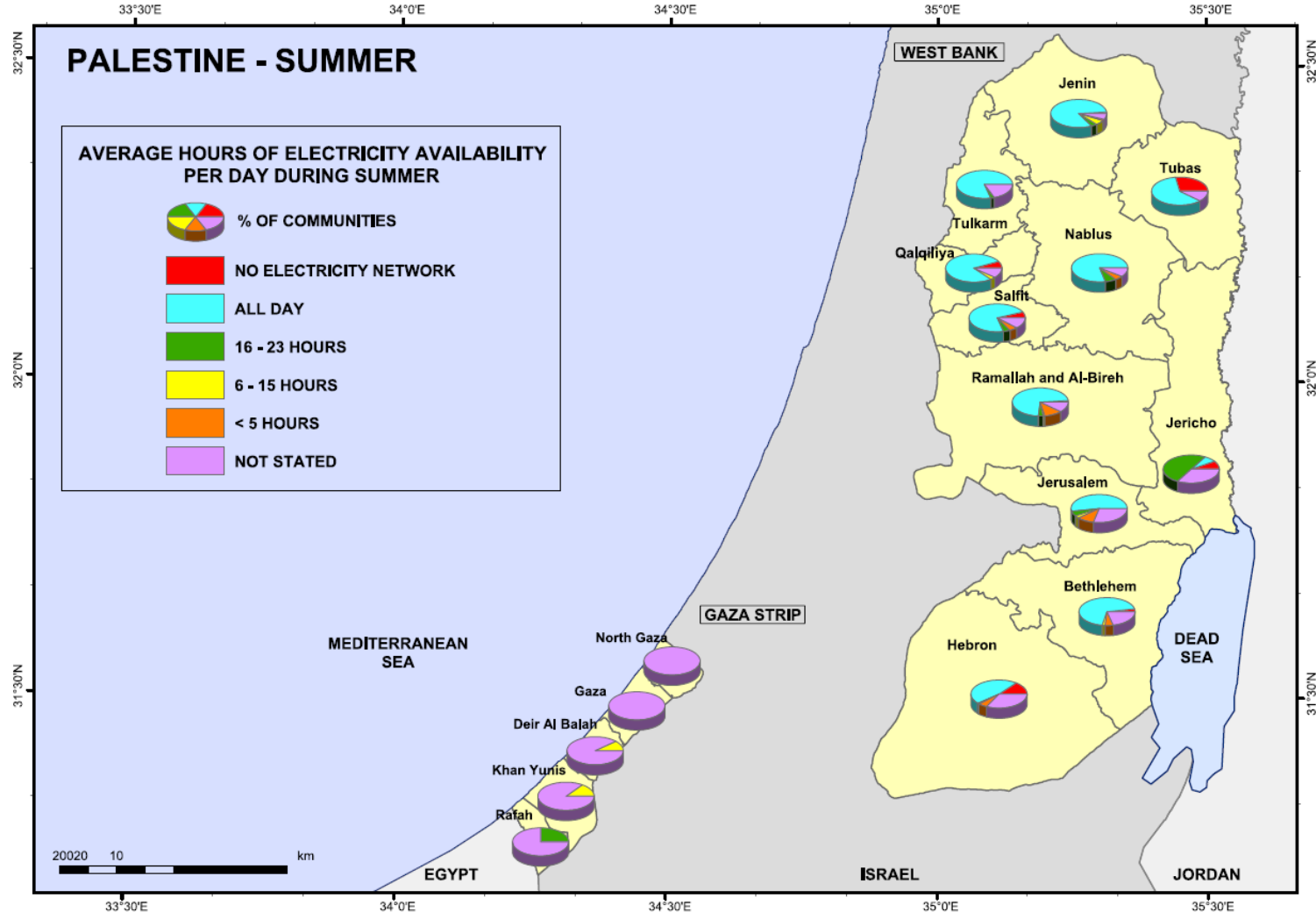
Population density in Palestine



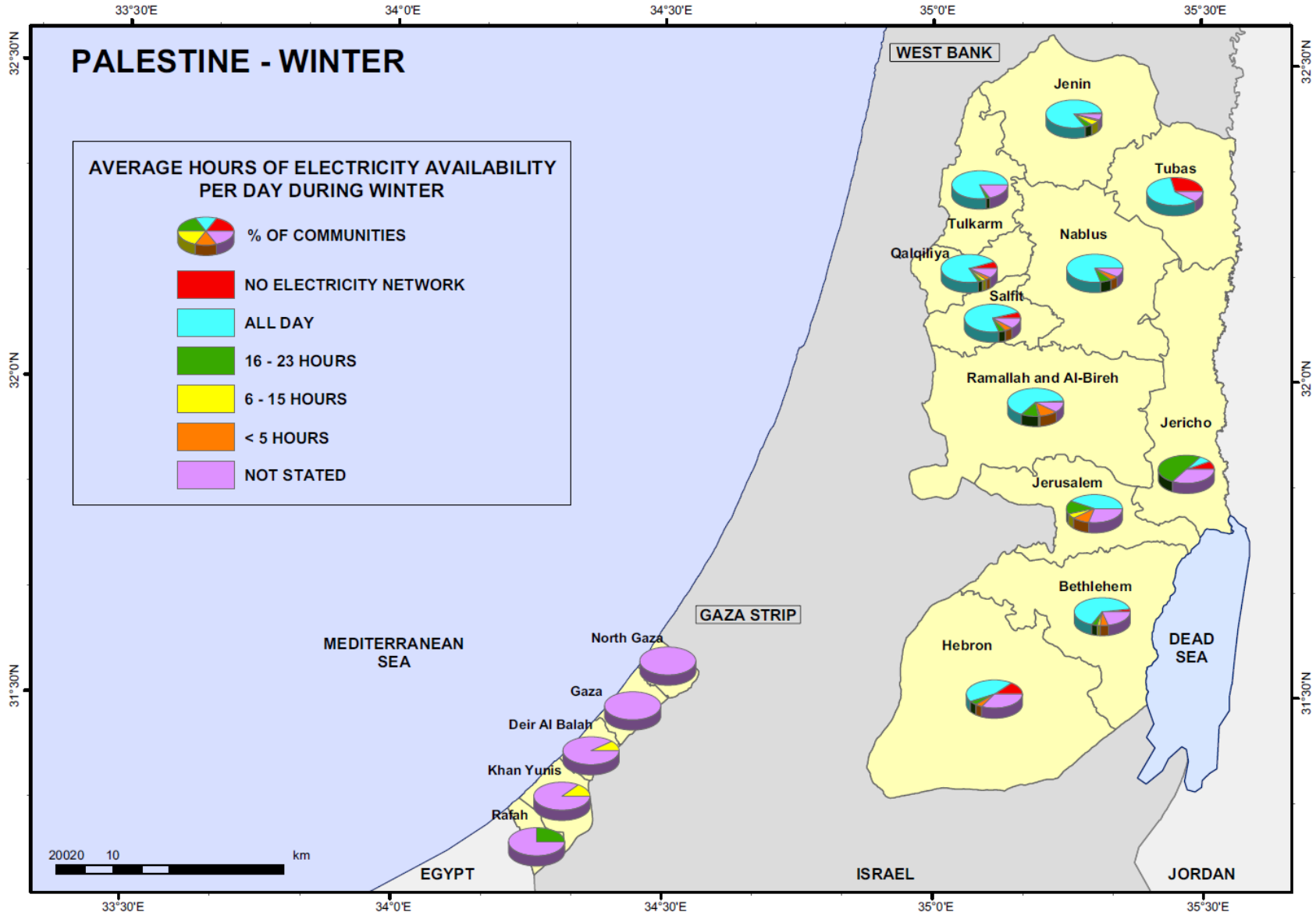
Palestinian population in 2014 by governorate



Average Hours of Electricity Availability per day in summer (2013).

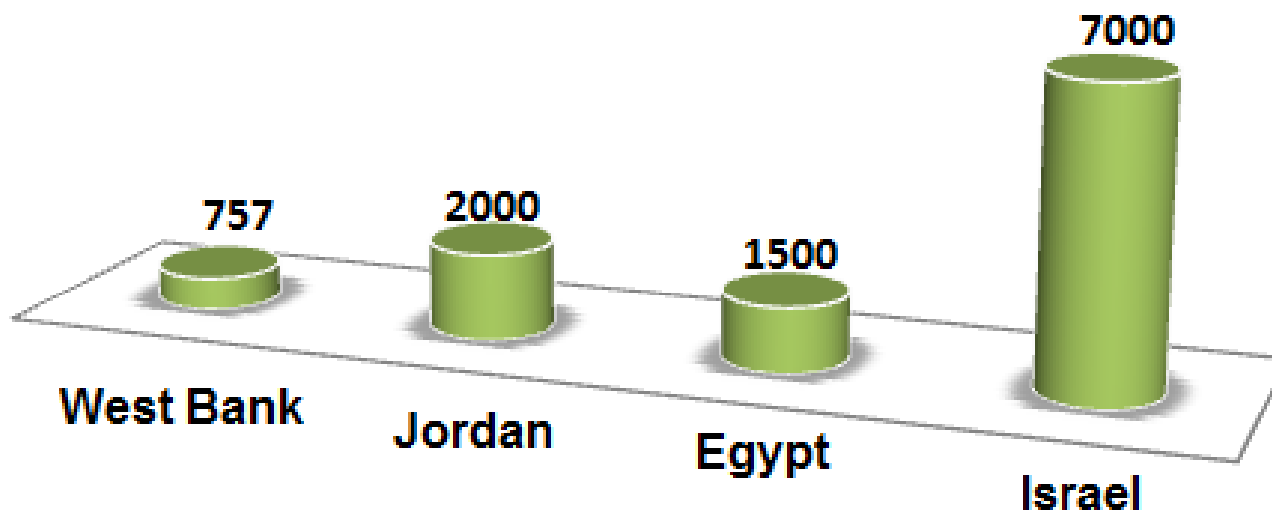


Average Hours of Electricity Availability per day in Winter (2013).

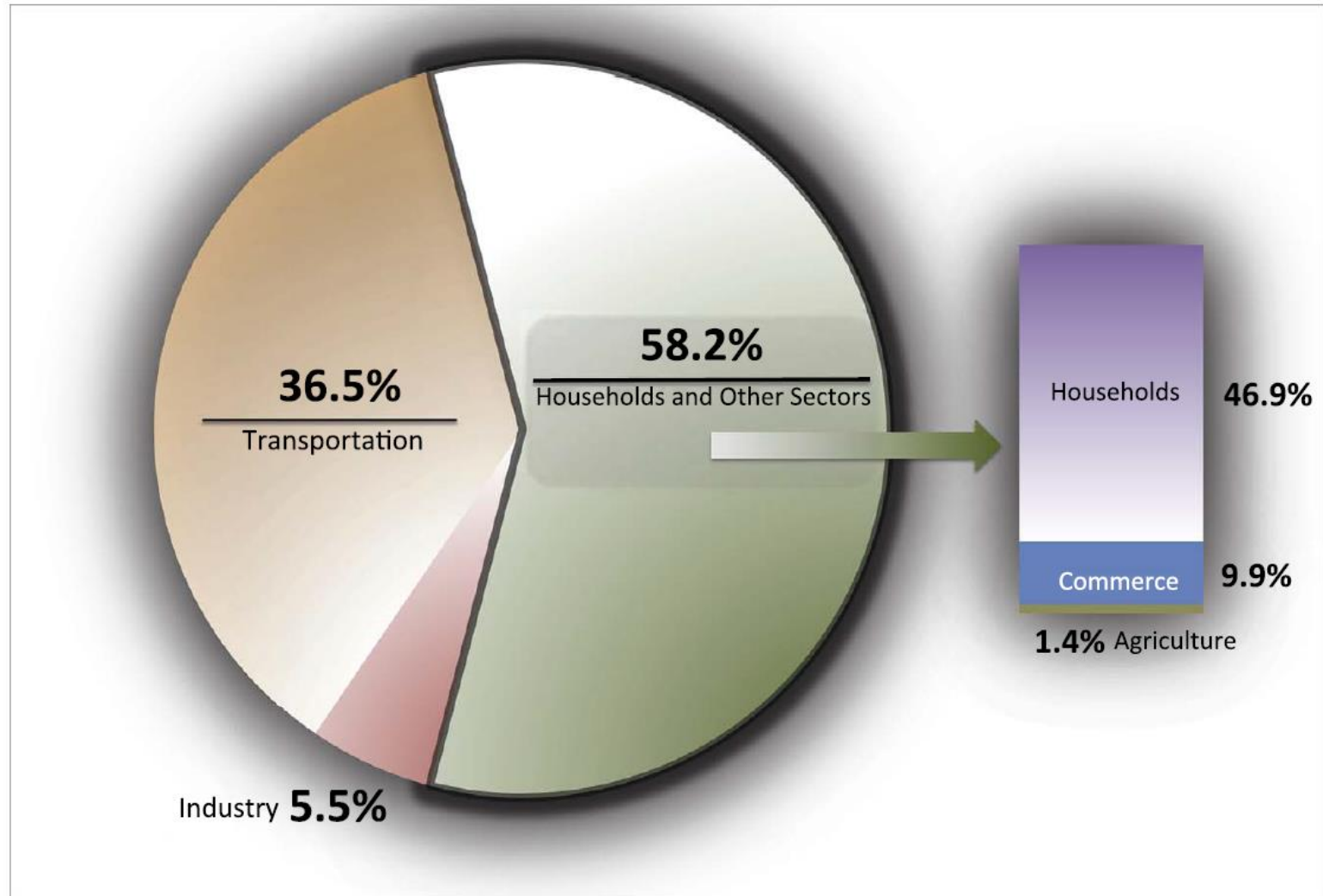


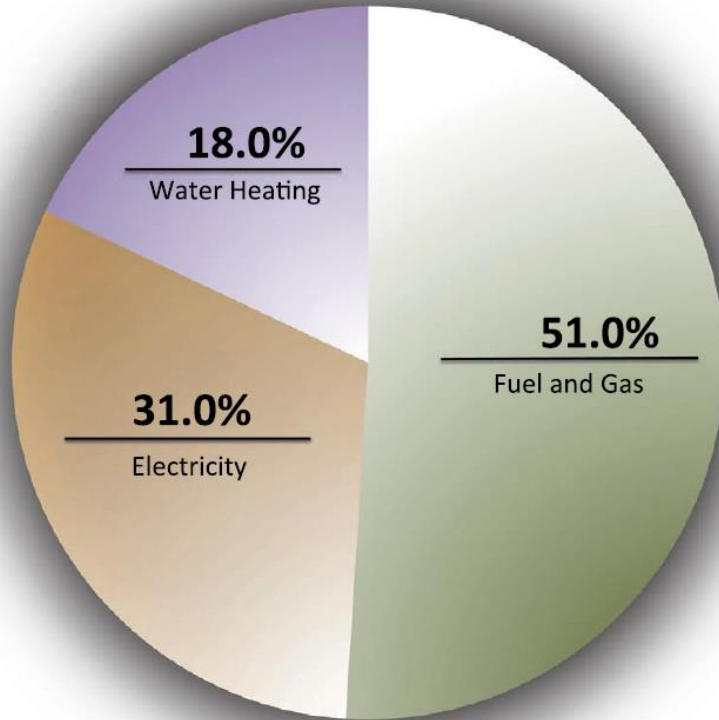
Energy Consumption

- The total energy consumption per habitant in Palestine is the lowest in the region (0.757 MW h/ inhabitant) and costs more than anywhere else in the Middle East countries.

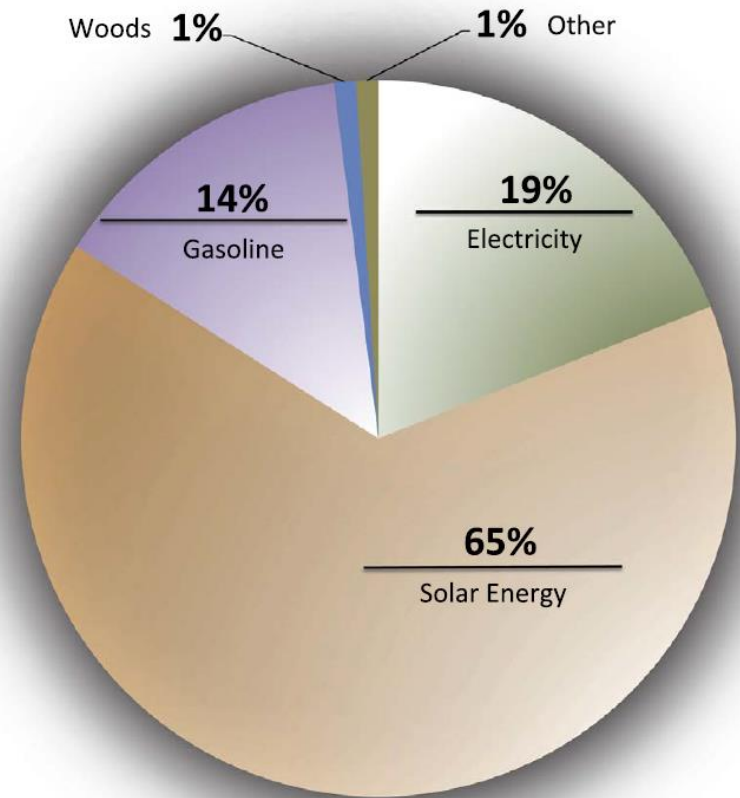


Energy consumption by sectors, 2013.





Total primary energy consumption in Palestine, 2013.



Distribution of energy consumption for water heating, 2013.

Electricity distribution (MW h) in Palestine by country in year 2013 (Source: Palestinian Energy and Natural Resources Authority, 2013).

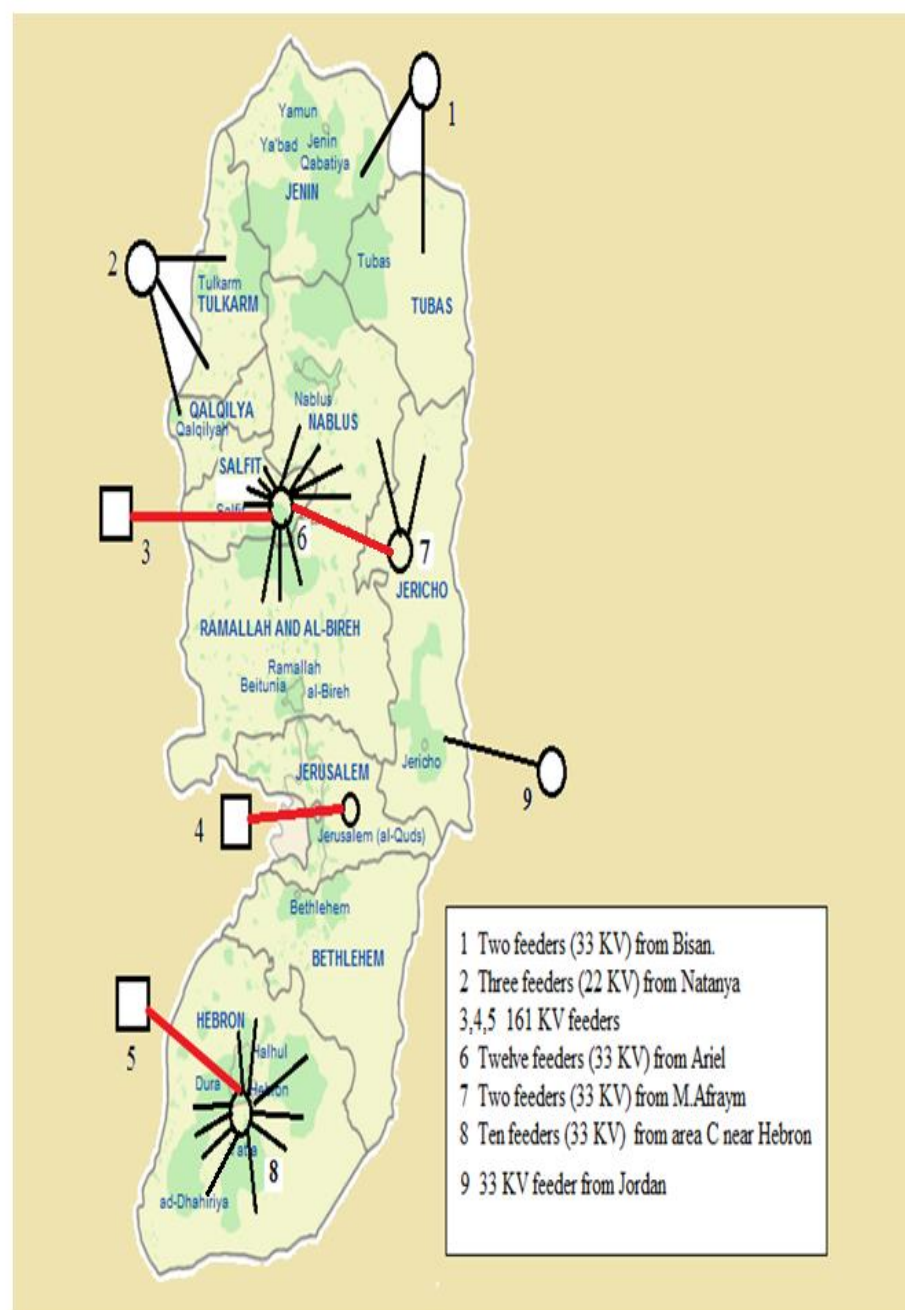
	Israel Electric Company (IEC)	Jordan	Egypt	Gaza Electricity Distribution Co.	Total
West Bank	3,365,597	41,401	0	0	3,406,998
Gaza Strip	1,119,211	0	208,045	402,607	1,729,863
Palestine (Total)	4,484,808	41,401	208,045	402,607	5,136,861

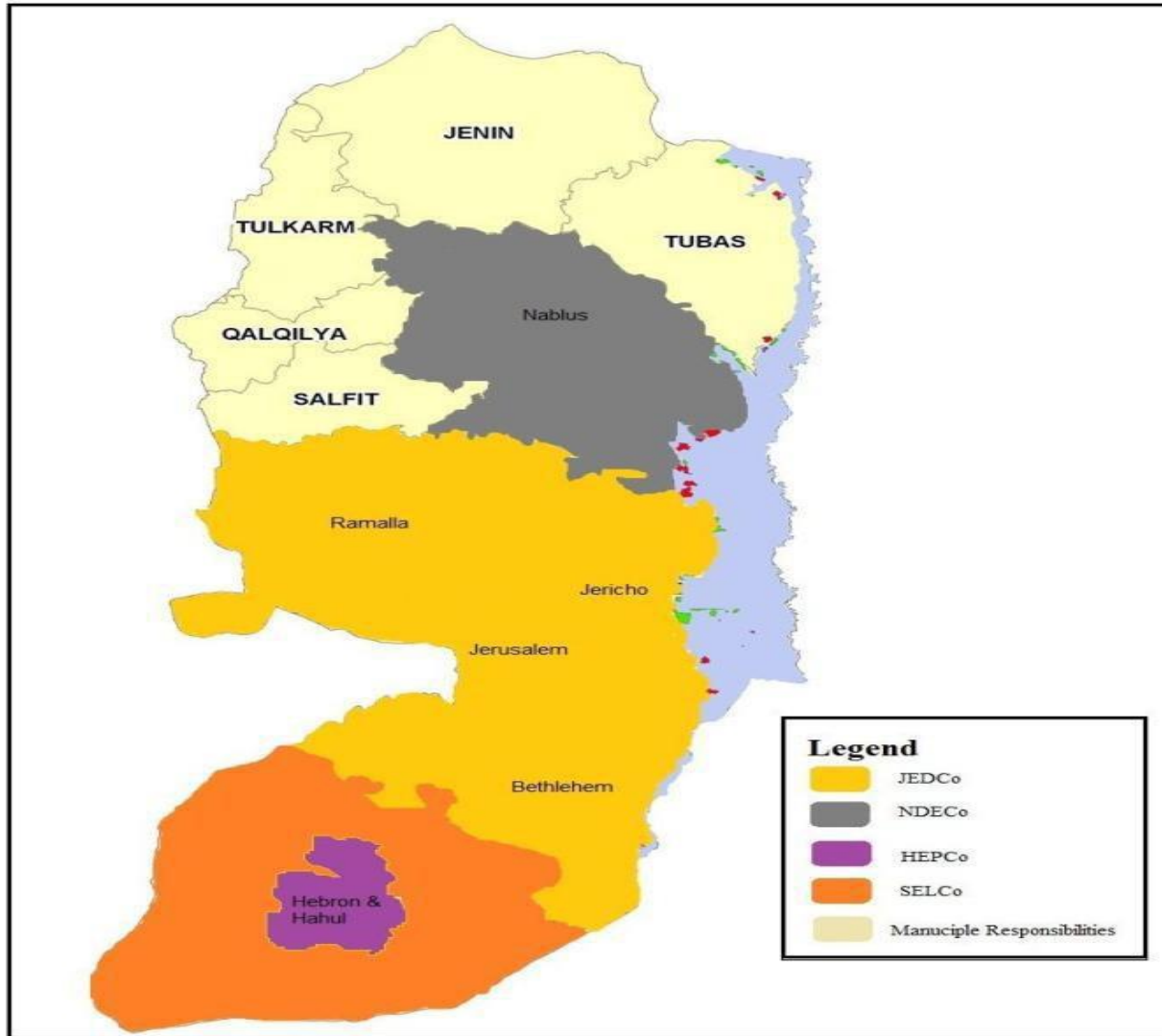
Electricity residential tariffs in West Bank and Gaza Strip (2014).

Range (kW)	Gaza Strip (\$/kW h)	West Bank (\$/kW h)
1.0–160	0.126	0.151
161–250	0.128	0.159
251–400	0.128	0.179

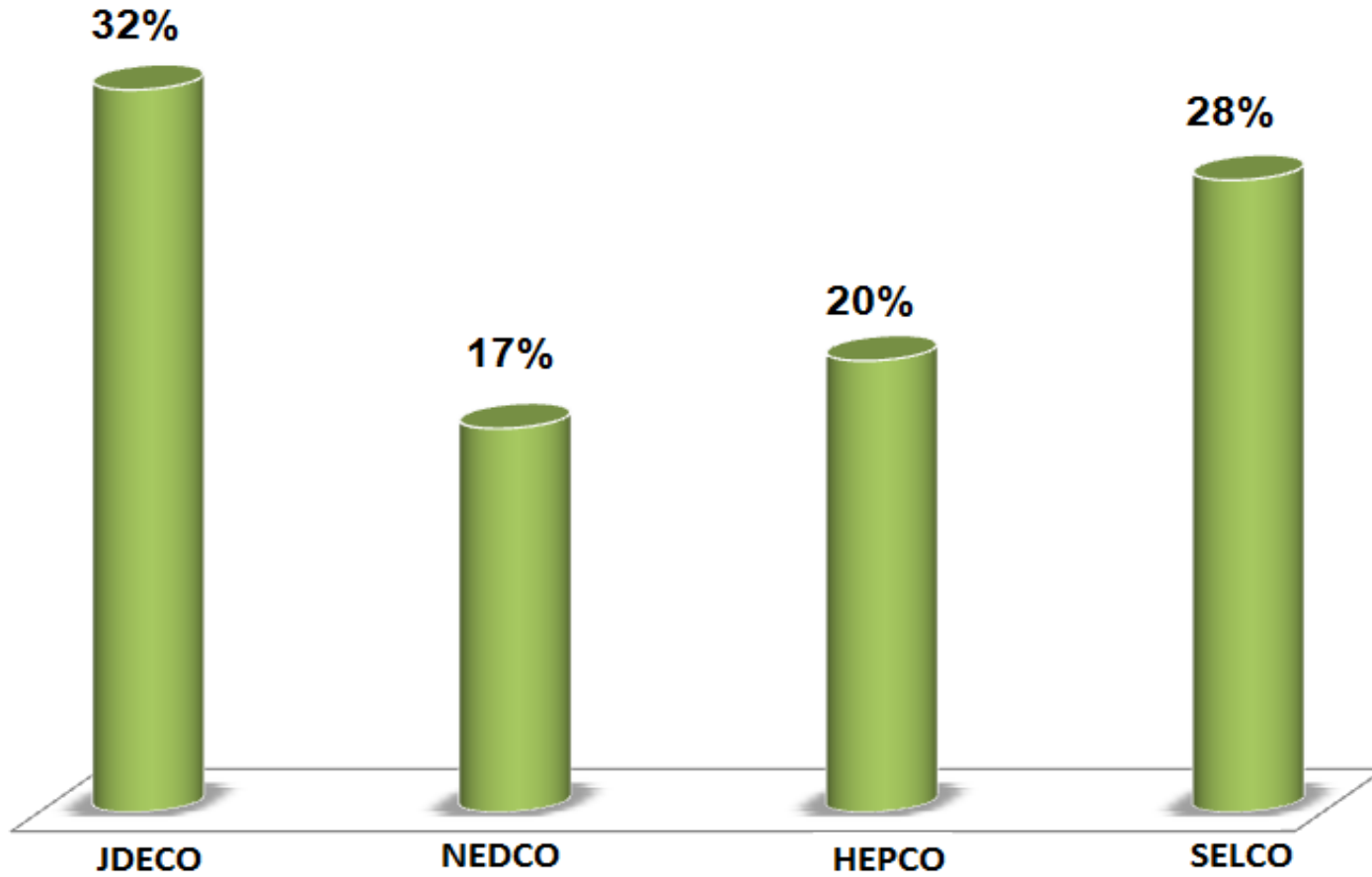
General Overview West Bank Electrical Network

- The only main transmission lines constructed in the West Bank by IEC are three main 161 kV overhead lines feeding the three main substations: in Hebron, Qalandia (Atarot) and Salfiet (Ara'el).
- The ranges of voltage of West Bank networks are 400V, 6.6 kV, 11kV, 33 kV.





Power Losses



ECE Strengths and drawbacks of the current situation of RE in Palestine

Strengths:

- High solar radiation.
- Palestine is geographically situated in an area with very good solar conditions. It has an average of solar irradiation of 5.4 kWh/m²/day.
- Awareness of the Palestinian government about renewable energies.
- Palestine government is in the way to develop the RE law and also creating a wind map.
- Local experience using RE.

ECE Strengths and drawbacks of the current situation of RE in Palestine

- Solar thermal is widely used by around the country. About 70% of hot water is produced by solar thermal technology, which means people already know and rely on RE technology.
- Entrepreneurship character of the private sector.
- Significant potential contribution to cover the future energy demand increase-Electricity energy demand increases yearly for about 6%. RE can help to cover this annual increment.

ECE Strengths and drawbacks of the current situation of RE in Palestine

Drawbacks

- No specific RE regulations defined. Since there are no regulation in the RE market, it is very difficult to create new companies and make investors establish their projects in the country.
- Energy dependency. Palestine depends on the energy imports mostly from Israel.
- Poor infrastructure. Currently the grid in Palestine it is divided into several isolated groups. It's being working for connect the different groups, and so have less points of connection with Israel and more managing capability of the energy in Palestine.

ECE Strengths and drawbacks of the current situation of RE in Palestine

- Small of land surface availability. This is an issue for large scale RE installations. Palestine lacks of terrain, in most of its area it is not possible to build installations or it is needed for agriculture.
- Poor conditions to develop local industry. Due to the lack of energy it is difficult to develop industry.
- Government policy. Government does not have plans to solve the increasing demand of electricity problems neither to solve the short cuts problems.

Thanks For Your Attention

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