

Palestine Polytechnic University

College of Engineering



Forecasting the demand of electrical energy in Hebron city

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Submitted to the College of Engineering

in partial fulfillment of the requirements for the

Bachelor degree in Electrical Engineering

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Palestine Polytechnic University

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Electrical Engineering Department

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إهداء و شكر

الحمد لله و الصلاة و السلام على خير الانام ، نبينا محمد عليه افضل الصلاة و أتم التسليم و

بعد

نشكركم الله أولا و أخير على ما وفقنا إليه من إنمام دراستنا الجامعية ، ثم نقدم بالشكر

إلى القلب الحنون ، من كانت بجانبنا بكل المراحل التي مضت من حياتنا بالمعاناة و كانت

شمعنا تحترق لتبهر دروسنا

إلى أمهاتنا الحبيبات

و إلى من علمنا أن نقف و كيف نبداً . . . إلى من علمنا الصعود و عيناها تراقبنا

آبائنا الاعزاء

إلى من قدم لنا الدعم و الاسناد و صبروا علينا . . .

لمن أمسك يدينا وعلمنا حرفا حرفا . . . سنهدي له نجاحنا اليوم إلى من كانوا سندنا لنا

وإلى من لهم الفضل بإرشادنا إلى طريق العلم والمعرفة إلى أساتذتنا الأفاضل، كم نحن

فخورون بكم.

أصدقائنا وأحببتنا ومن سهرنا معنا في مسيرتنا العلمية إلى من مدوا أياديهم البيضاء في ظلام

وكانوا عوننا لنا الليل

أيام جميلة قضيناها نعيشها الآن لحظة بلحظة ونشعر وكأنها شريط يمر بمخيلتنا من جديد

، لن ننساكم ما حيننا .

Abstract

Future development of electric power systems must pursue a number of different goals. The power system should be economically efficient, it should provide reliable energy supply and should not damage the environment. At the same time, operation and development of the system is influenced by a variety of uncertain and random factors.

In this study, data and statistics of the electrical network load were collected from the Hebron distribution network within 5 years. The data and statistics will be entered to the ETAP software. The network will be analyzed during peak periods, average loads, and summer time in order to obtain indicators of the network losses and economic feasibility to reduce them. All substation data was collected and then used to predict the load at each substation in 2050. The data of photovoltaic (PV) system will be collected to study the amount of the energy produced from the system, and then analyzed these data to estimate the power will be produced.

Several scenarios will be developed to improve the network performance and efficiency such as adding a main station or build a ring system. Some of the substation was analyzed during peak periods, average loads, and summer time in order to obtain indicators of the network losses and economic feasibility to reduce them.

In addition, several solutions were developed to solve the problems by adding main additional feeder to alduhdah substation to solve the problem of high load.

الخلاصة

يجب أن يسعى التطوير المستقبلي لأنظمة الطاقة الكهربائية إلى تحقيق عدد من الأهداف المختلفة, بحيث يكون نظام الطاقة فعالاً اقتصادياً ، ويجب أن يوفر مصدر طاقة موثوقاً وأن لا يضر بالبيئة. في الوقت نفسه ، يتأثر تشغيل النظام وتطويره بمجموعة متنوعة من العوامل العشوائية وغير المؤكدة.

تم في هذه الدراسة جمع بيانات وإحصاءات حمل الشبكة الكهربائية عن شبكة توزيع كهرباء الخليل خلال ال 5 سنوات. بحيث أنه سيتم إدخال البيانات والإحصاءات في برنامج الايتاب, وذلك من أجل تحليل الشبكة خلال فترات الذروة ومتوسط الأحمال ووقت الصيف من أجل الحصول على مؤشرات لخسائر الشبكة والخسائر الفنية والجدوى الاقتصادية لتقليلها. تم جمع البيانات من جميع المحطات وذلك من أجل أن يتم التوقع المستقبلي للأحمال في عام 2050. بالإضافة الى ذلك, سيتم جمع بيانات الطاقة الشمسية لكي يتم دراسة كمية الطاقة المنتجة من هذه الخلايا, ثم تحليل هذه البيانات لتقدير الطاقة التي سيتم انتاجها خلال الفترة القادمة.

سيتم تطوير العديد من السيناريوهات لتحسين أداء الشبكة وكفاءته كإمكانية بناء نظام ربط حلقي أو اضافة محطة تحويل رئيسية. وتم جمع البيانات لبعض المحطات وتم ادخالها لبرنامج الايتاب وتحليل الشبكة خلال فترة الذروة وعند متوسط الأحمال وذلك من أجل الحصول على مؤشرات الخسارة الفنية والجدوى الاقتصادية للحد منها.

بالإضافة إلى ذلك ، تم تطوير العديد من الحلول لحل المشاكل عن طريق إضافة مغذي رئيسي إضافي لمحطة الضاحية الفرعية لحل مشكلة الحمل العالي.

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


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List of Abbreviation

	Abbreviation statement
IEC	Israel Electric Company
MPC	Main power station
S/S	Sub-Station
LV	low voltage
ONAF	Oil Natural Air Forced
ONAN	Oil Natural Air Natural
RMU	Ring Main Unit
CCT(RMU)	Cable,cable,Transformer
ACSR	Aluminum Conductor Steel Reinforced
kWh	Kilowatt-hour
LOSSES	The power system losses
AUX Transf.	Auxiliary Transformer
ETAP	Electrical Transient Analysis Program
MW	Mega Watt
NIS	New Israeli Shekel
MVA	Mega Volt Ampere
kV	Kilovolt
SCADA	Supervisory Control and Data Acquisition

List of Symbols

	Bus
	Transformer
	Circuit Breaker
	Cable
	Load

Chapter 1

Introduction

1.1 Background

Energy resources and their availability are extremely significant for every country. Energy is considered to be an important component in the social, industrial, technological, economic, and sustainable development of any country. Among all forms of energy, electrical energy is regarded as high-grade energy and has been the major driver for technological and economic development. In all developed countries, extensive programs for energy conservation, efficiency, and load management are planned and implemented for decades, and especially after year 1973. The impact of these programs on energy and demand reduction is tremendous.

Palestine is considered as one of the poorest countries considering the availability of energy resources. Nearly all main energy resources like fossil fuels and electricity are imported from Israel. This makes Israeli control the quantity, price, tariff, condition and form of each source of energy to Palestine. Studies show that the Palestinian areas are dependent on the supply of electricity to external sources. Israel provided the Palestinian areas with 88% of the available electricity, while the electricity generation station in Gaza produced 7.3% of the consumption in Palestine and 23.5% of Gaza consumption. In contrast, the amount of electricity imported from Jordan and Egypt amounted to about 4% of consumption in the Palestinian territories [1]. Consequently, the electrical system in the West Bank is currently limited to the distribution system and the beginning of the establishment of a transmission and generation systems as renewable energy.

The electric power systems are among the most complex systems created by the mankind. These include hundreds of thousands of components: generators, transformers, transmission lines, control and protection equipment, etc. Construction of power systems and their

operation and maintenance require billiards of dollars. The functions are interdependent: the processes going on in one of the system's components influence functioning of the other elements.

Operation conditions are continuously varying in time – new customers and power system objects appear; prices grow and legislation changes. Additionally, constantly changing weather conditions, e.g., temperature and wind speed, influence significantly operation of the system. The costly objects and elements have a finite life of several decades. This motivates the need to estimate the conditions, which may arise in a rather distant future. Clearly, these conditions cannot be predicted exactly. Therefore, it is necessary to account for uncertainties and random factors. At the same time, construction of some objects requires both considerable investments and certain time. Thus, the planning mistakes leading to the wrong decisions cannot be corrected fast and may result in substantial financial losses.

Distribution networks face great challenges with the changes in current and future distribution networks, such as the inclusion of more green energy, installation of more controllable power electronic devices, differentiated power quality requirements from different customers and increased active engagement from customer sides. To provide stable and greener electricity and meet the requirements from various stakeholders, the network should properly plan and utilize the available network resources to meet the constraints, improve quality of services and reduce the operating cost. Proper planning/operation strategies enable the cost-effective running of the network and improved customer experience in using electricity or participating in network operation/management. Distribution planning and operation problems (such as the integration of more renewable energy, the utilization of flexibility resources and customer engagement for various purposes, etc.) can be tackled with appropriate definition of optimization problems and the use of properly tailored optimization techniques.

1.2 Project General Description

Hebron Electric Limited Liability Company was established in 2000 on an area of 91 km² to serve 340,000 citizens of Hebron and Halhul, with a capital of 25 million Jordanian Dinars and assets of 91 million NIS. The percentage of electricity customers in Hebron and Halhul is 100%, with 50,409 customers until the end of 2017.

Power network system in Hebron city established mainly to provide adequate electricity supply to Customers as economically as possible with reasonable assurance of reliability. Nowadays, the Power distribution networks have grown exponentially in term of size and technology over the Past few years.

In this project we contribute solutions to improve the performance of the Medium Voltage electrical network to solve the problem of limited power in the city. This includes studying the best way to increase the energy of the city by adding power transformers to a certain substation and separate a certain area with a new substation to increase the load on the main substation in the city.

1.3 Objectives

- Analyze the medium voltage network through software and real data.
- Using regression model depending on some factors, we need to know the load forecasting and load growth for HEPCO regions from 2021 until 2030.
- The capability needs for each substation.
- Number of renewable energy projects on each feeder.
- Minimize the technical loss of the distribution network.
- The capacity of the different feeders.

1.4 Challenges and Obstacles

- 1) The difficulties of getting loads data for the last four years especially from SELCO Company.
- 2) The limitation of operation area of Palestinian power companies which limited into medium voltage.

1.4 Project Methodology

- ❖ Collecting data of the distribution network.
- ❖ Suggesting the feasible scenarios for developing and improving the network.
- ❖ Solving the network problems and developing its efficiency.
- ❖ Getting the suitable and required information and statistics from the ETAP Program.
- ❖ Building the network by analyzing the network by ETAP.

Chapter 2

Electricity network of the Hebron City

2.1 Background

An electric power system is defined as a network of electrical components used to supply, generate, transmit, and consume electric power. An electric power system that supplies power to homes and industries for a sizeable region is called an electric grid. Electric grids can be divided into three-layered complex interconnected networks consisting of generation, transmission, and distribution components. An electric grid also contains control software and associated equipment to transmit electricity from the place of generation to residential, industrial, or commercial users. This is achieved by transporting electrical power from generation buses to distribution substations through transmission buses interconnected by transmission lines. The point of generation is usually located in a centralized point which is far removed from the place where it is consumed. Electrical energy is generated in the power plant by transforming other sources of energy. These sources include chemical, heat, hydraulic, mechanical, geothermal, nuclear, solar, and wind which can be used to produce electrical energy.

Electrical energy produced from this conversion is then transformed to high voltage which is more suitable for efficient long-distance transportation to the consumption locations using high voltage power lines. The high voltage electrical energy is stepped down to lower voltage by transformers at the substations so that it is suitable to distribute for residential, commercial and industrial consumption. The end user is connected to lower voltages which are obtained by a stepdown process using a transformer in several stages as network is reduced in capacity. The grid can be connected to a single power source or electricity generating plant but is usually linked with other plants to provide a more flexible and reliable network.

2.2 Hebron City Network

The Israeli generated power through started to deliver in the early of 1973 to the Hebron municipality through distribution network owned by the Municipality. The electric power delivered increased from 26MVA in 1994 to 104MVA in 2016 due to the normal modernization and industrialization increase.

The city of Hebron is supplied with electric power from a major power station of the Israel Electric Company (IEC) in Jabal al-Masjid area as shown in figure (2.1), where the voltage is transform from 161 kV to 33 kV. The distribution network as shown in figure (2.3) extends from Halhul in the north to the Aqbet Angel in the south contains 8 main stations. Most loads are connected by distribution transformers 11/0.4 kV

The five main connecting points are controlled through Main Power Control (MPC) station as shown in figure (2.4); the station contains 14 circuit breakers and 6 couplers, to control the main lines at 33 kV and to supply energy to the main substations.

Concession Area Map

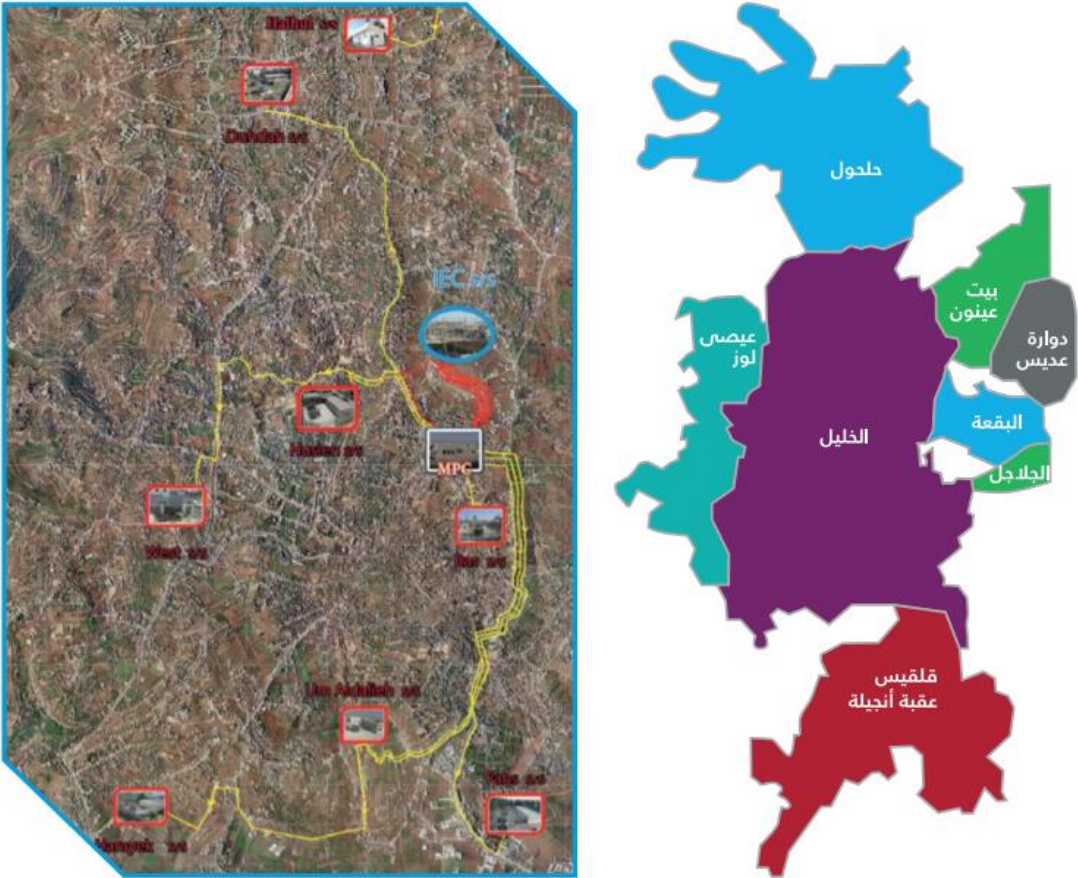


Figure (2.1): Main Substation 33/11kV Location.

2.3 Distribution System

The primary purpose of an electricity distribution system is to meet the customer’s demands for energy after receiving the bulk electrical energy from transmission or subtransmission substation. There are basically two major types of distribution substations: primary substation and customer substation. The primary substation serves as a load center and the customer substation interfaces to the low voltage (LV) network. Customer substation is referred to a distribution room normally provided by the customer. The distribution room

can accommodate a number of HV switchgear panel and the transformer to enable LV connection to the customer incoming switchboard.

Typical distribution systems begin as the medium-voltage three-phase circuit, typically about 30–60 kV, and terminate at a lower secondary three- or single-phase voltage typically below 1 kV at the customer's premise, usually at the meter. Distribution feeder circuits usually consist of overhead and underground circuits in a mix of branching laterals from the station to the various customers. The circuit is designed around various requirements such as required peak load, voltage, distance to customers, and other local conditions such as terrain, visual regulations, or customer requirements. These various branching laterals can be operated in a radial configuration or as a looped configuration, where two or more parts of the feeder are connected together usually through a normally open distribution switch. High-density urban areas are often connected in a complex distribution underground network providing a highly redundant and reliable means connecting to customers.

Most three-phase systems are for larger loads such as commercial or industrial customers. The three phase systems are often drawn as one line that provides the customer with 220 V, which the customer then connects to devices. This is served from a three-phase distribution feeder normally connected in a Y configuration consisting of a neutral center conductor and a conductor for each phase, typically assigned a letter A, B, or C. Single-phase customers are then connected by a small neighborhood distribution transformer connected from one of the phases to neutral.

2.3.1. Primary Substation 33/11kV

The distribution system of a power supply system is the closest one to the customer. Therefore, its failures affect customer service more directly than, for example, failures on the transmission and generating systems, which usually do not cause customer service interruptions.

There are basically two major types of distribution substations: Primary substation and distribution substation. The primary substation serves as a load center and the distribution substation interfaces to the low voltage (LV) network.

Depending on the geographical location, the distribution network can be in the form of overhead lines or underground cables. Cables are commonly used in urban areas and overhead lines are adopted for rural areas. Different network configurations are possible in order to meet the required supply reliability. Protection, control and monitoring equipment are provided to enable effective operation of the distribution network.

Hebron Electricity Network contains the following Substations:

2.3.1.1 Alfahas Substation

There are a 3 33/11kV Power Transformers in alfahas substation, which has 13MVA, 10MVA and 10MVA capacity for each transformer with indoor switchgears as shown in the Fig. (2.2).



Fig. (2.2): Power Transformer and switchgear in Alfahas substation.

Table (2.1): The main specification of Alfahas substation.

No. of switchgear at 33kV	5
No. of switchgear at 11kV	12
No. of Aux. Transformer	1
No. of couplers	2
Cable length(km)	3.9
Cable size	(1*300 Al)
Insulation L1-N(kV)	18/30

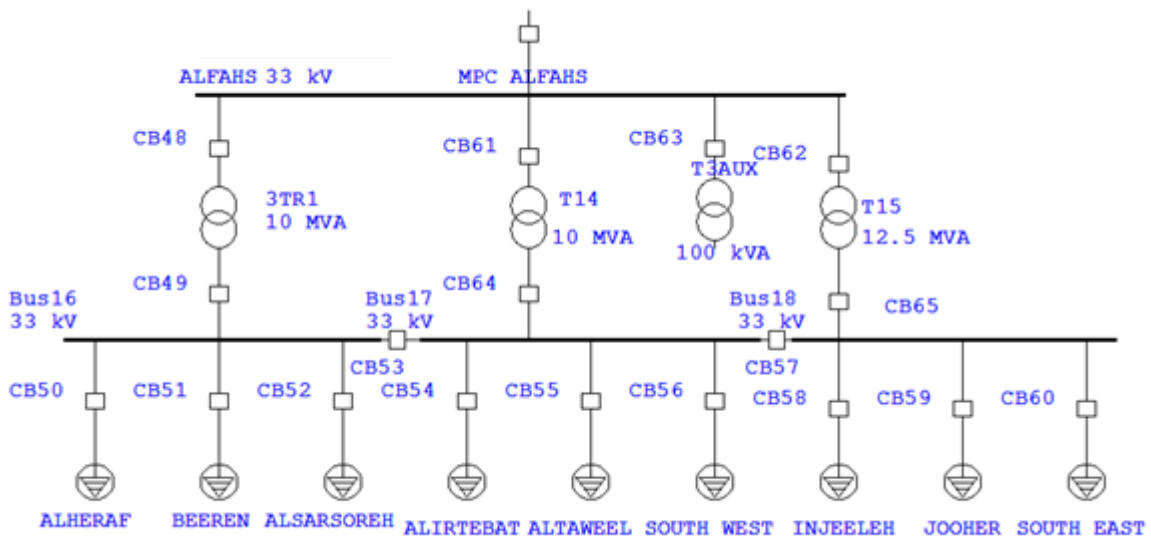


Figure (2.3): Single line diagram for Alfahas S/S

2.3.1.2 West Substations

West substation has 2 Power Transformers 33/11kV, which has 13MVA capacity for each transformer. The station contains a number of indoor switchgears as mentioned in the Table (2.2).



Fig. (2.4): Power Transformer and switchgear in West substation.

Table (2.2): The main specification of a West substation.

No. of switchgear at 33kV	6
No. of switchgear at 11kV	9
No. of Aux. Transformer	1
No. of couplers	1
Cable length(km)	3.6
Cable size	(1*300 Cu)
Insulation L1-N(kV)	26-45

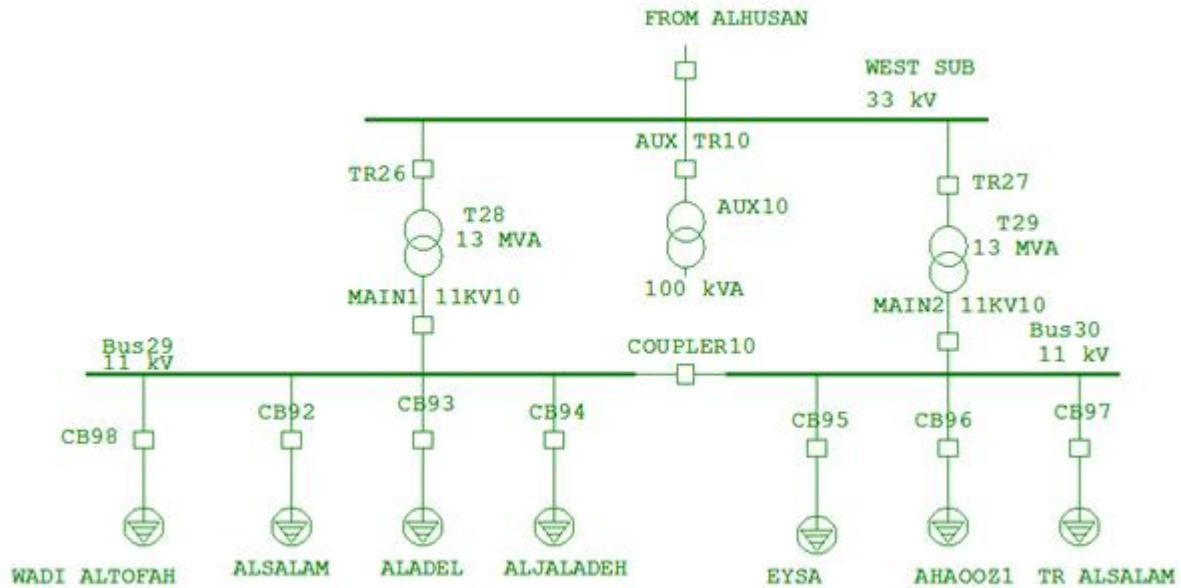


Figure (2.5): Single line diagram for West (S/S)

2.3.1.3 Umaldaleh Substation

The station has 2 Power Transformers 33/11kV; the capacity of the first transformer is 10MVA, the capacity of the second transformer is 13MVA. The station contains a number of indoor switchgears as mentioned in the Table (2.3).



Fig. (2.6): Power Transformer and switchgear in Umaldaleh substation.

Table (2.3): The main specification of Umaldaleh substation.

No. of switchgear at 33kV	5
No. of switchgear at 11kV	8
No. of Aux. Transformer	1
No. of couplers	1
Cable length(km)	3.9
Cable size	(1*300 Cu)
Insulation L1-N(kV)	26-45

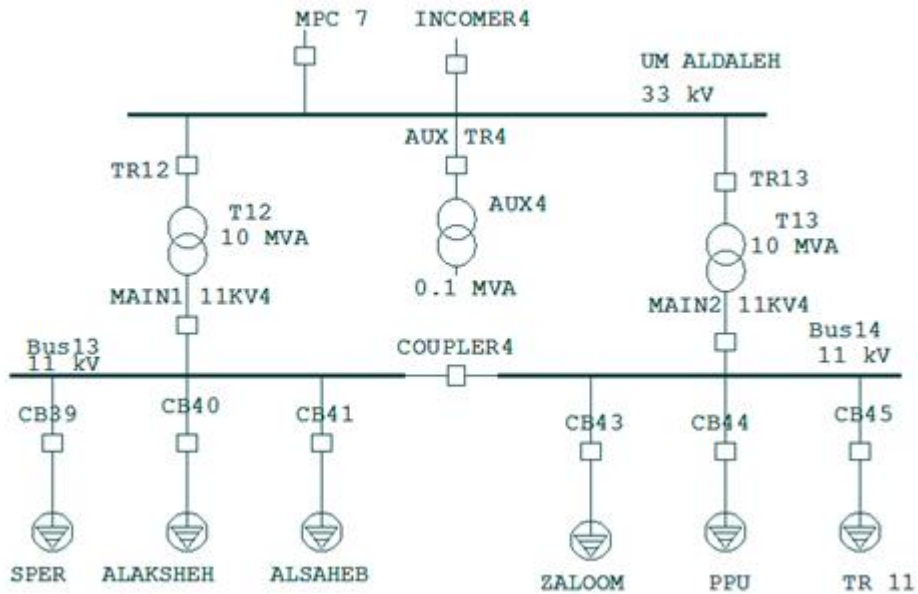


Figure (2.7): Single line diagram for Umaldaleh (S/S)

2.3.1.4 Alhareaq Substation

Alhareaq substation has 2 Power Transformers 33/11kV, which has 13MVA and 10MVA for each transformer. The station contains a number of indoor switchgears as mentioned in the Table (2.4).



Figure (2.8): Power Transformer and switchgear in Alhareaq substation.

Table (2.4): The main specification of Alhareaq substation.

No. of switchgear at 33kV	4
No. of switchgear at 11kV	4
No. of Aux. Transformer	1
No. of couplers	1
Cable length(km)	6.5
Cable size	(1*300 Cu)
Insulation L1-N(kV)	26-45

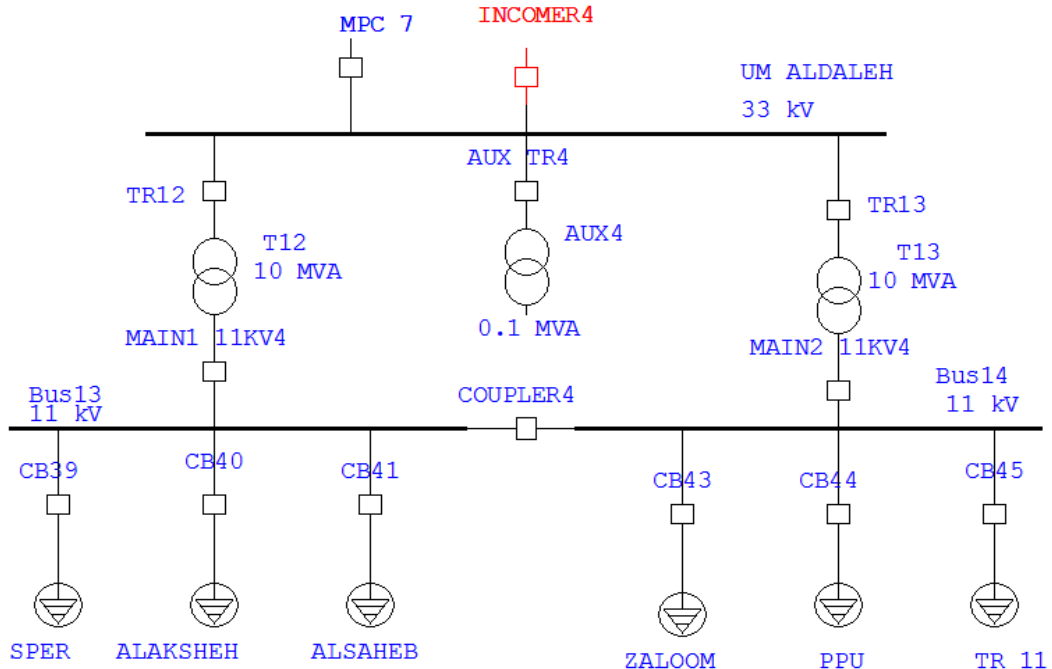


Figure (2.9): Single line diagram for Alhareaq (S/S)

2.3.1.5 Alhusein Substation

Alhusein substation has 2 Power Transformers 33/11kV, which has 10MVA for each transformers. The station contains a number of indoor switchgears as mentioned in the Table (2.5).



Figure (2.10): Power Transformer and switchgear in Alhusein substation.

Table (2.5): The main specification of Alhusein substation.

No. of switchgear at 33kV	4
No. of switchgear at 11kV	8
No. of Aux. Transformer	1
No. of couplers	1
Cable length(km)	1.3
Cable size	(1*300 Cu)
Insulation L1-N(kV)	26-45

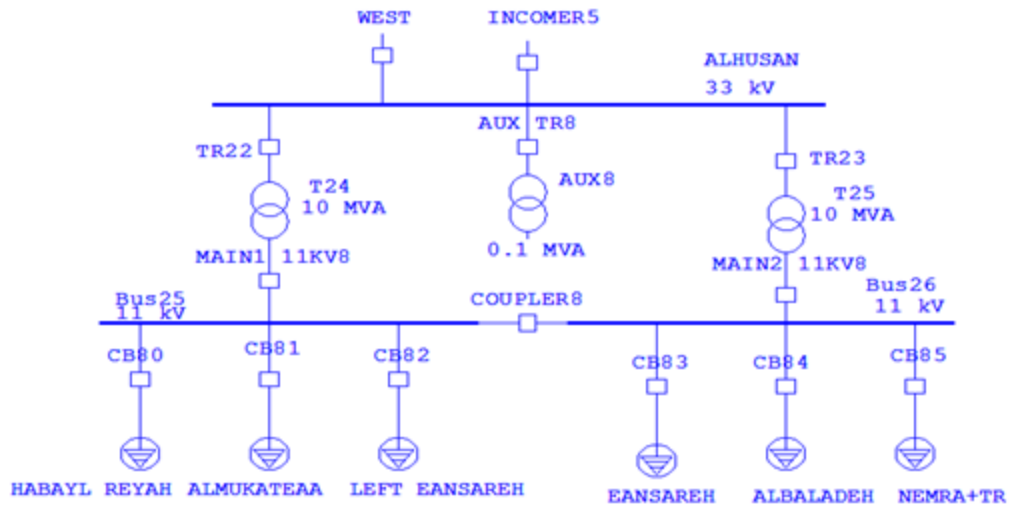


Figure (2.11): Single line diagram for Alhusein(S/S)

2.3.1.6 Alras Substation

Alras substation has 2 Power Transformers 33/11kV, which has 10MVA for each transformer. The station contains a number of indoor switchgears as mentioned in the Table (2.6).



Figure (2.12): Power Transformer and switchgear in Alras substation.

Table (2.6): The main specification of Alras substation.

No. of switchgear at 33kV	5
No. of switchgear at 11kV	10
No. of Aux. Transformer	1
No. of couplers	1
Cable length(km)	0.5
Cable size	(1*300 Al)
Insulation L1-N(kV)	26-45

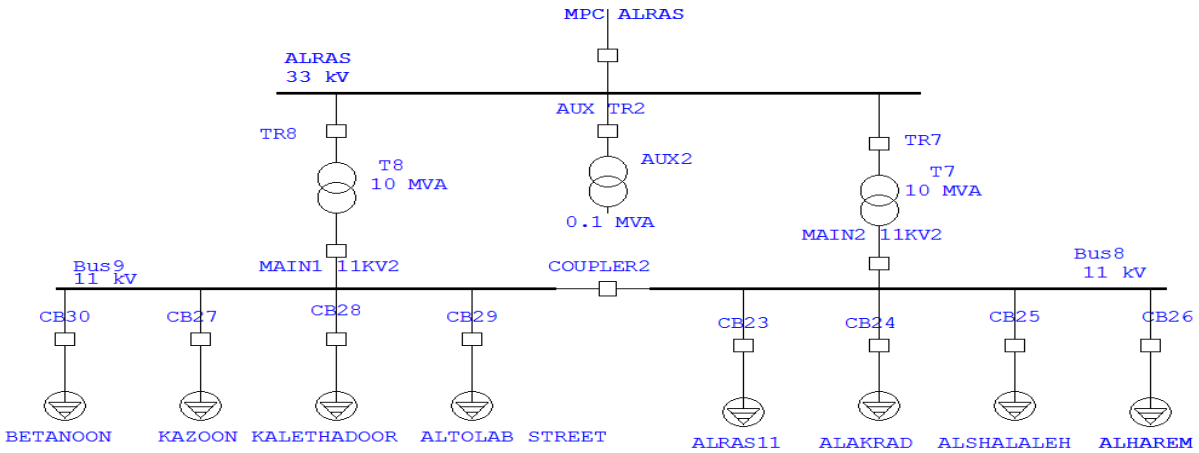


Figure (2.13): Single line diagram for Alras S/S

2.3.1.7 Alduhdah Substation

Alduhdah substation has 2 Power Transformers 33/11kV, which has 10MVA for each transformer. The station contains a number of indoor switchgears as mentioned in the Table (2.7).



Figure (2.14): Power Transformer and switchgear in Alduhdah substation.

Table (2.7): The main specification of Alras substation.

No. of switchgear at 33kV	5
No. of switchgear at 11kV	10
No. of Aux.Transformer	1

No. of couplers	1
Cable length(km)	0.5
Cable size	(1*300 Al)
Insulation L1-N(kV)	18/30

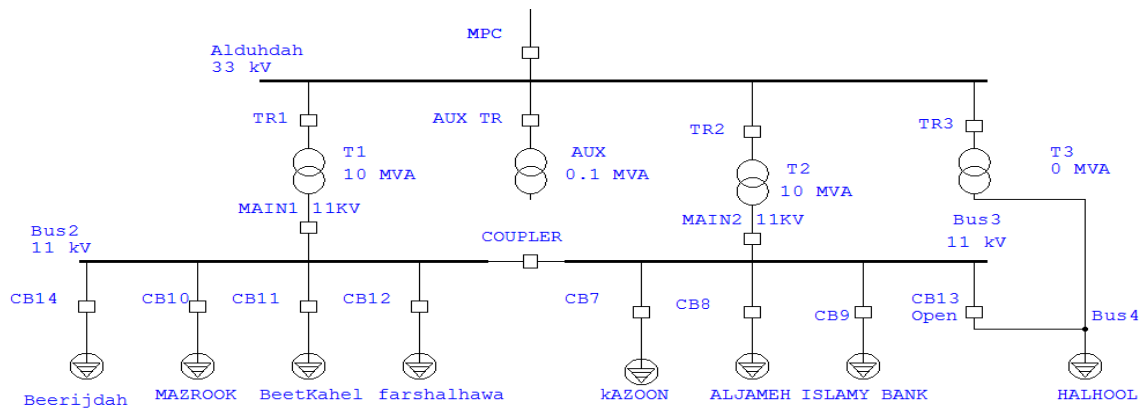


Figure (2.15): Single line diagram for Alduhdah Substation (S/S)

2.3.2 Overhead lines and Underground Cables

Overhead electricity lines are usually held up by wooden poles or steel towers. Typically, overhead lines are more common in rural areas as they are used to cover greater distances. Underground electricity cables are laid below the ground and are usually found in built up areas such as cities. The medium voltage network in the Hebron municipality network is divided into 33 kV and 11 kV network:

- **11kV Network:**

The 11kV network contains overhead lines and underground cables, Hebron electricity is working for replacing the overhead networks to underground cables.

- **33kV network:**

All 33KV overhead lines were changed into underground cables for several considerations, Safety and reduce the interruptions and losses on the network are the most important reasons.

2.3.3 Distribution Transformers

619 distribution transformers are distributed in different areas in the Hebron municipality, these transformers have a wide range of (kVA), from (100-1000) kVA, and various rating of voltages, and this can be shown as follow:

Table (2.8): Distribution Transformers.

TRANSFORMER RATED	NUMBER
100	17
160	63
200	2
250	108
315	9
400	180
500	18
630	148
800	42
1000	32

2.3.4 Distribution Substations 11/0.4kV

Distribution substation typically operates at 2.4 – 34.5 kV voltage levels, and delivers electric energy directly to industrial and residential consumers. Distribution feeders transport power from the distribution substations to the end consumers' premises. These feeders serve a large number of premises and usually contain many branches.

At the consumers' premises, distribution transformers transform the distribution voltage to the service level voltage directly used in households and industrial plants, usually from 110 to 600 V.

Distribution Stations in Hebron Electricity provide two types of customers, special for industrial loads and general for homes and commercial loads.

2.3.5 Ring Main Unit (RMU)

A ring main unit (RMU) is a factory assembled, metal enclosed set of switchgear used at the load connection points of a ring-type distribution network. It includes in one unit two switches that can connect the load to either or both main conductors, and a fusible switch or circuit breaker and switch that feed a distribution transformer. The metal enclosed unit connects to the transformer either through a bus throat of standardized dimensions, or else through cables and is usually installed outdoors. Ring main cables enter and leave the cabinet. This type of switchgear is used for medium-voltage power distribution, from 7200 volts to about 36000 volts. Hebron Electric used Ring Main Unit as shown in Fig. (2.16) and Table (2.9) to control the 11kV network and to protect distribution transformers.



Figure (2.16): Ring Main Unit.

Table (2.9) classification of the Ring Main Unit according to the number of cables or transformers.

Units	Number
CCC	9
CCT	182
CCCT	92
CCTT	11
CCCCT	12
CCTTT	1
Total	307

Chapter 3

3.1 Loads in Hebron Electric Network

Depending upon the uses of electrical energy, loads on the power system are divided into a different category. Loads of power systems are divided into industrial, Commercial, and residential. The industrial loads are composite loads, and induction motors form a high proportion of these load. These composite loads are functions of voltage and frequency and form a major pan of the system load. Commercial and residential loads consist largely of lighting, heating, and the system load. Commercial and residential loads consist largely of lighting, heating, and cooling. These loads are independent of frequency and consume negligibly small reactive power [2]. The following table 3.1 and Fig. (3.1) classify different type of services with power consumption for each service in Hebron city on 2020.

Table (3.1): The power consumption of each service in Hebron city.

Type of Service	Consumption(kWhr)
Domestic	152,844,599
Commercial	98,421,271
Industrial	143,311,971
Street lighting	10,185,982
Water Pumps	1,879,834
Temporary	985,806
Total	405,272,330

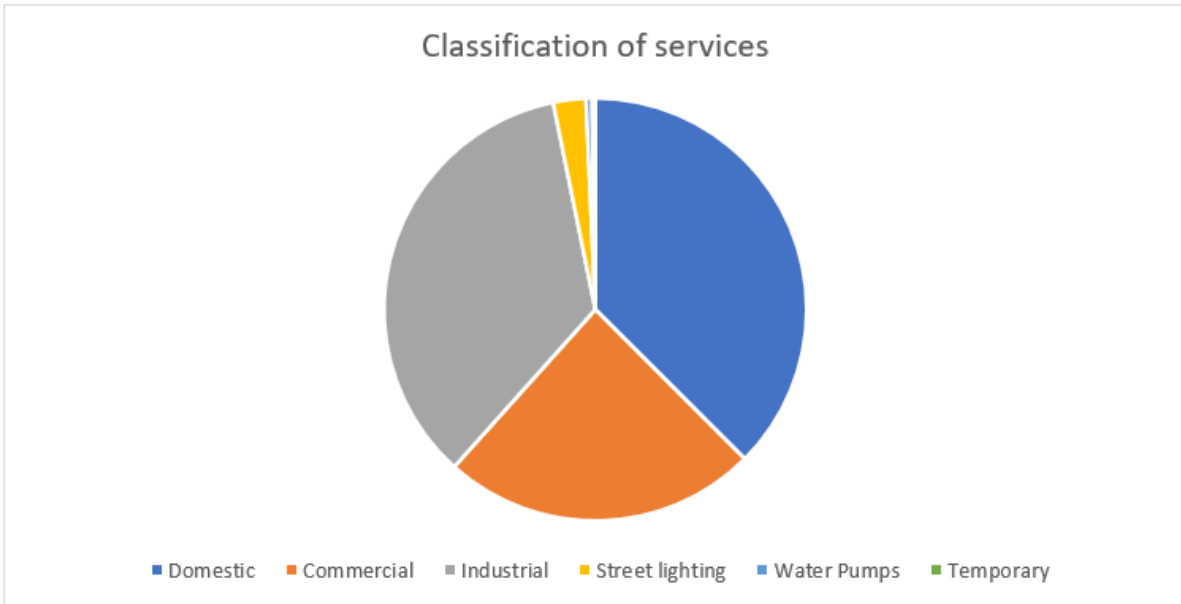


Figure (3.1): Classification of services [4].

3.2 Hebron Peak and Maximum and Minimum load

As many of the city's residents rely on electrical heating devices, the household loads, commercial and industrial share during the winter as shown in Fig. (3.2) the composition of the maximum load of the electricity network of Hebron and has reached the maximum load for 2021 to 122 MVA [3]. It was noted from the graph that the highest consumption in the city of Hebron is in the first two months of the year and decreases slightly during the summer.

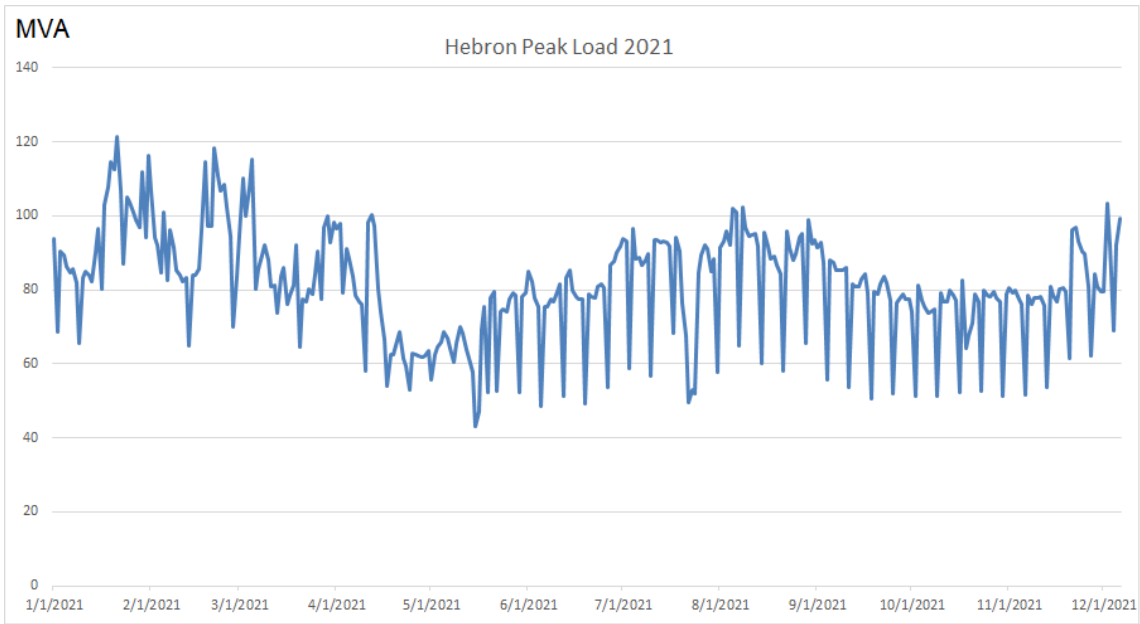


Figure (3.2): Peak Load for Hebron City – 2021

The maximum and minimum load of Hebron city on 2021 shown in the following Fig. (3.3).

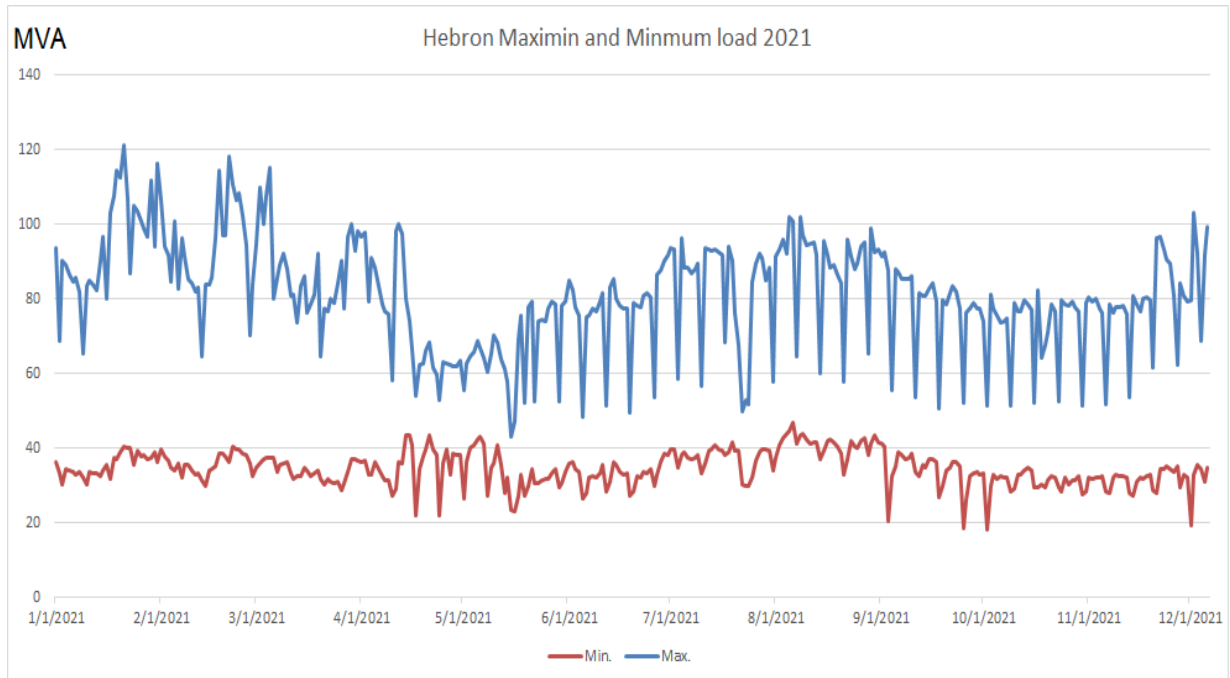


Figure (3.3): Maximum and minimum load.

The average of the maximum daily loads in the city of Hebron and the average of the minimum daily loads during the past 5 years are shown in the Fig. (3.4) and Fig. (3.5), respectively

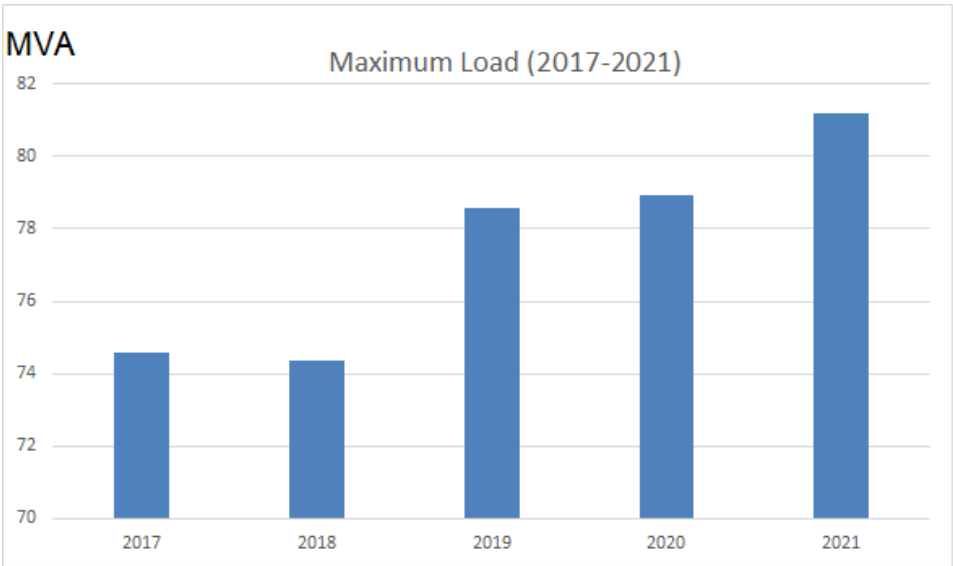


Figure (3.4): The Average of Maximum load in Hebron.

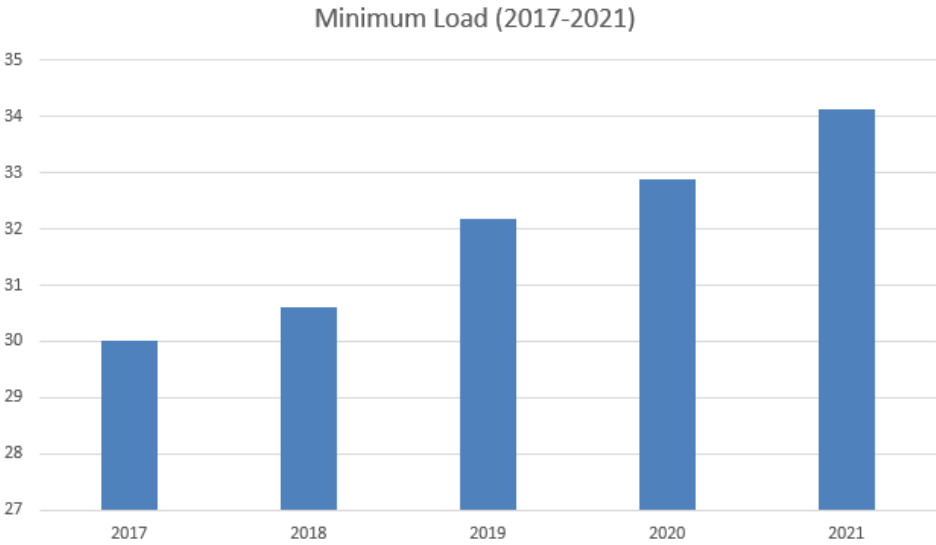


Figure (3.5): The Average of Minimum load in Hebron.

The Hebron city contains 7 substations distributed differently throughout the city and works to provide consumers with electricity, and the loads on each of these stations vary. Alfahs substation is one of the largest substations in Hebron city, which has the highest loads. Fig. (3.6) shows the average daily loads on this substation, and it is clear from the graph that the amount of loads on the electrical station increases annually.

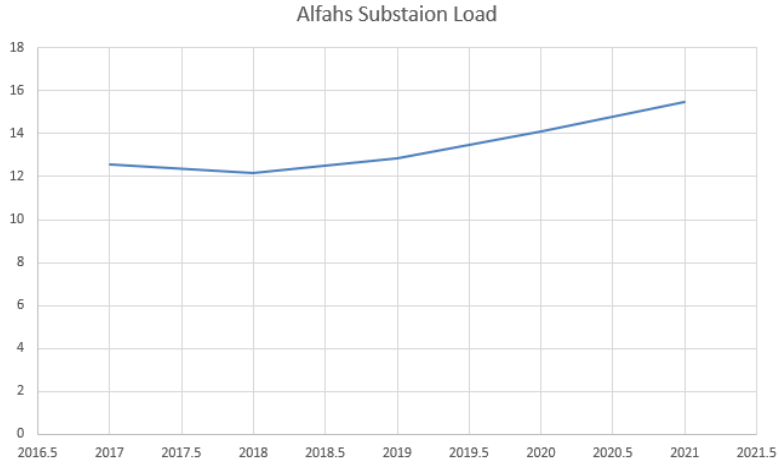


Figure (3.6): Alfahs Substation load 2017-2021.

Fig. (3.7) and Fig. (3.8) shows the average loads on Alras substation between the years 2017-2021, as it becomes clear that the amount of annual change of the loads is small.

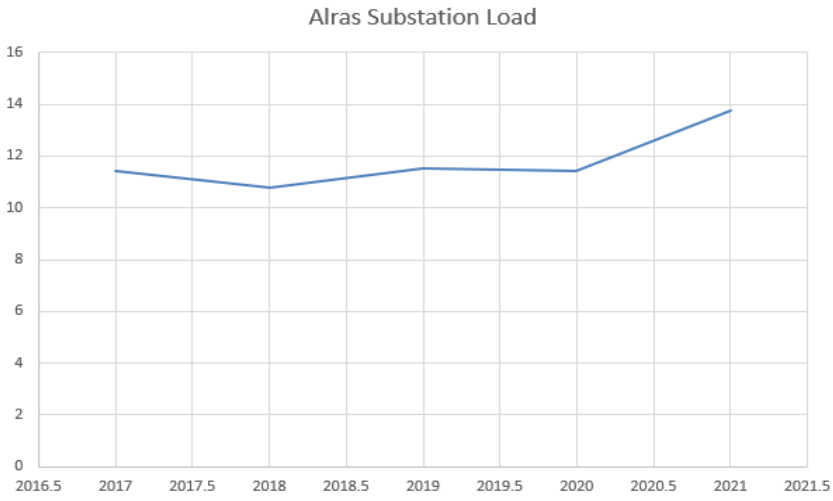


Figure (3.7): Alras Substation load 2017-2021.

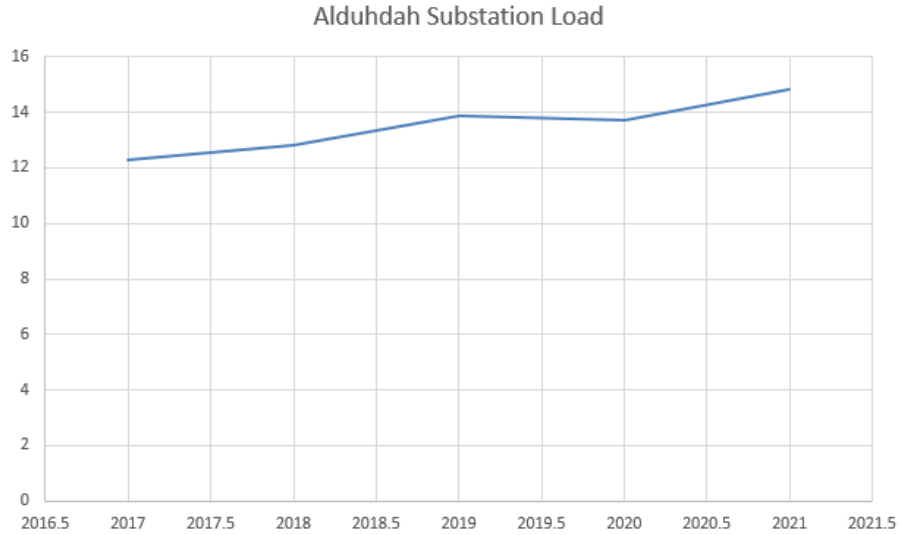


Figure (3.8): Alduhdah Substation load 2017-2021.

Fig. (3.9), Fig. (3.10), Fig. (3.11) and Fig. (3.12) shows the amount of change in the average daily loads, as it is also clear that the amount of annual change is not affected much and changes a little amount with a noticeable increase in the amount of load in 2021.

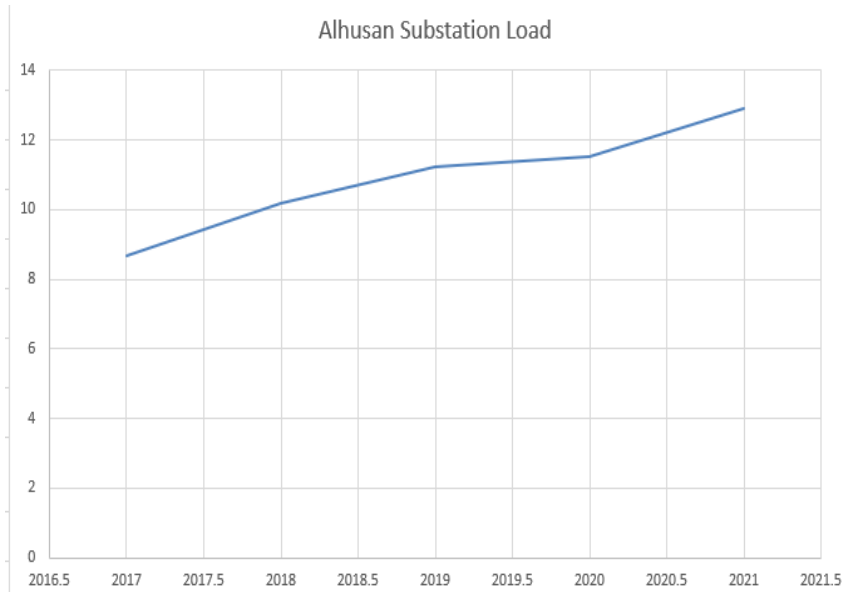


Figure (3.9): Alhusan Substation load 2017-2021.

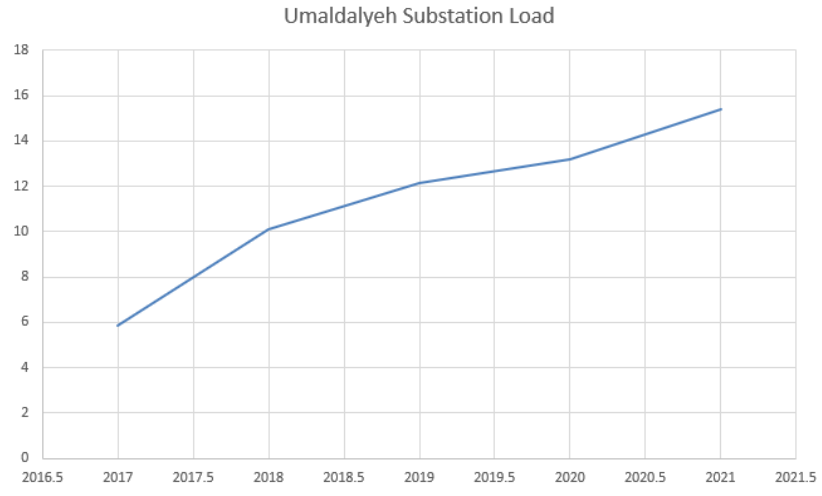


Figure (3.10): Umaidaleh Substation load 2017-2021.

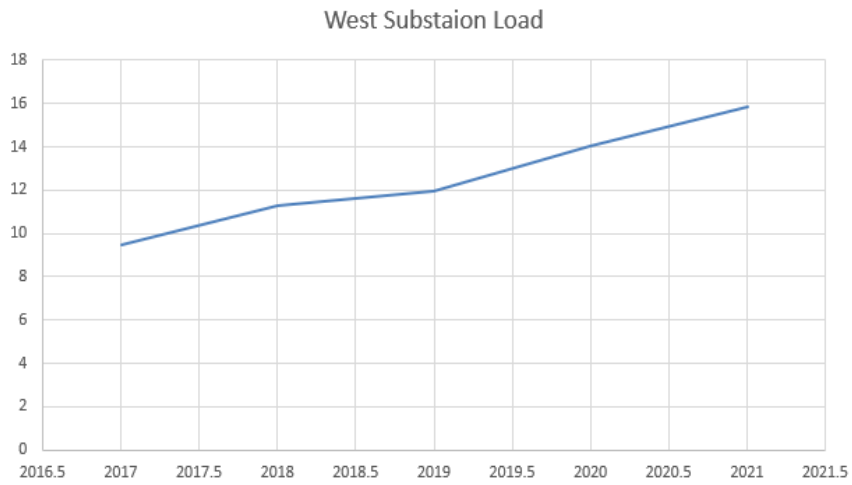


Figure (3.11): West Substation load 2017-2021.

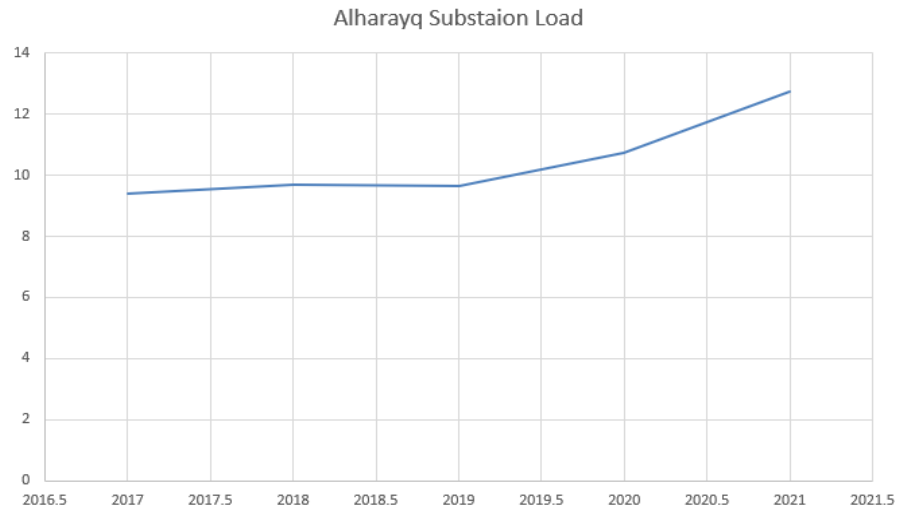


Figure (3.12): Alharayq Substation load 2017-2021.

Table (3.2) shows the monthly change in the loads (MVA) for the city of Hebron from 2017-2021.

	2017	2018	2019	2020	2021
1	91.75	93.30	95.62	102.60	94.48
2	90.55	80.91	93.71	103.36	92.91
3	77.91	71.03	91.19	84.78	87.58
4	67.95	69.00	76.91	58.65	73.52
5	67.04	66.02	63.29	56.59	66.48
6	58.40	62.35	69.92	69.52	76.86
7	79.14	76.09	77.41	71.38	81.85
8	77.74	71.10	71.98	74.27	89.53

Table (3.2):
Changes in Hebron

9	67.99	71.51	73.65	86.84	78.72
10	65.30	68.74	70.32	72.82	72.50
11	72.21	72.68	70.67	78.12	78.52
12	79.42	89.25	89.15	89.93	

Load
2017-2021.

Power Consumptions from 2012 to 2017 as shown in Fig (3.13).

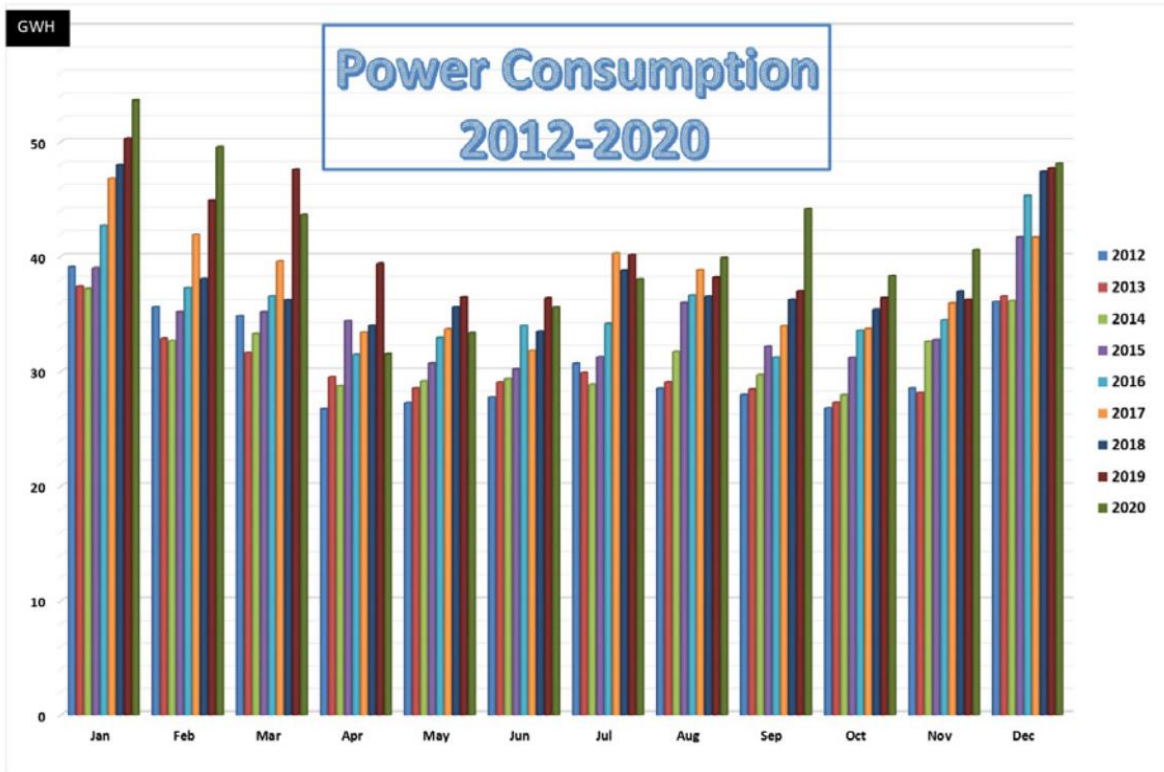


Figure (3.13): Power Consumptions from 2012 to 2020 [4].

Fig. (3.14) shows the difference between the loads in Hebron city between the year 2017 and 2020, and it is noted through the graph that the amount of load required increased, especially in the months of 6, 8, 9 and 10.

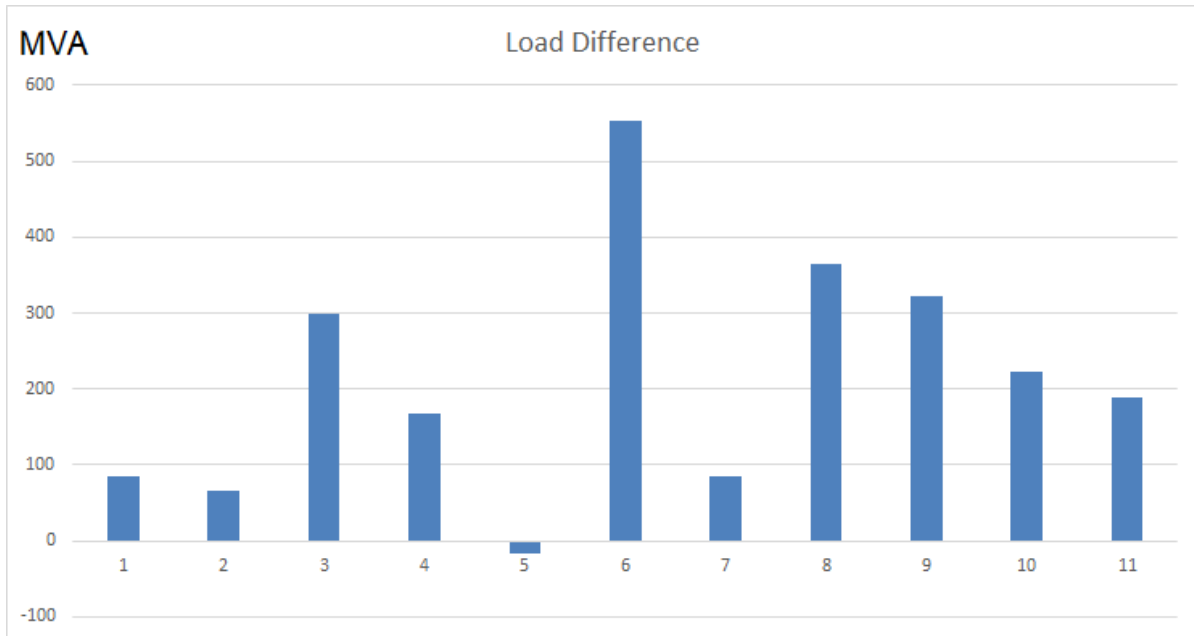


Fig. (3.14): Load differences between 2017 and 2021.

3.3 A Photovoltaic System

The solar energy conversion into electricity takes place in a semiconductor device that is called a solar cell. A solar cell is a device that converts the energy of light directly into electricity characterized by an output voltage and current. In order to generate usable power for practical devices, which require a particular voltage or current for their operation, a number of solar cells are connected together to form a solar panel, also called a PV module. For large-scale generation of solar electricity, the solar panels are connected together into a solar array. The solar panels are part of a complete PV solar system, which, depending on the application, may comprise batteries for electricity storage,

dc/ac inverters that connect a PV system to the electrical grid and mounting elements. These additional parts of the PV solar system form the balance of system (BOS) components.

The PA has managed to regulate the energy sector since it was established in 1994. This can be seen by different acts and laws enforced by the council of ministers to improve the sector. Firstly, the Council released Decision No. 13 in 2009 by the name “The General Electricity Law”. This law was established to initiate the regulation and upgrading of the electricity sector in Palestine.

It is noticed after making many changes to the laws related to solar generation systems that the number of users of these systems to generate solar energy is increasing annually. The following Fig. (3.15) shows the amount of electrical energy production in the city of Hebron through solar cells during the past 5 years, through which it is noted that the amount of energy produced in recent years has increased.

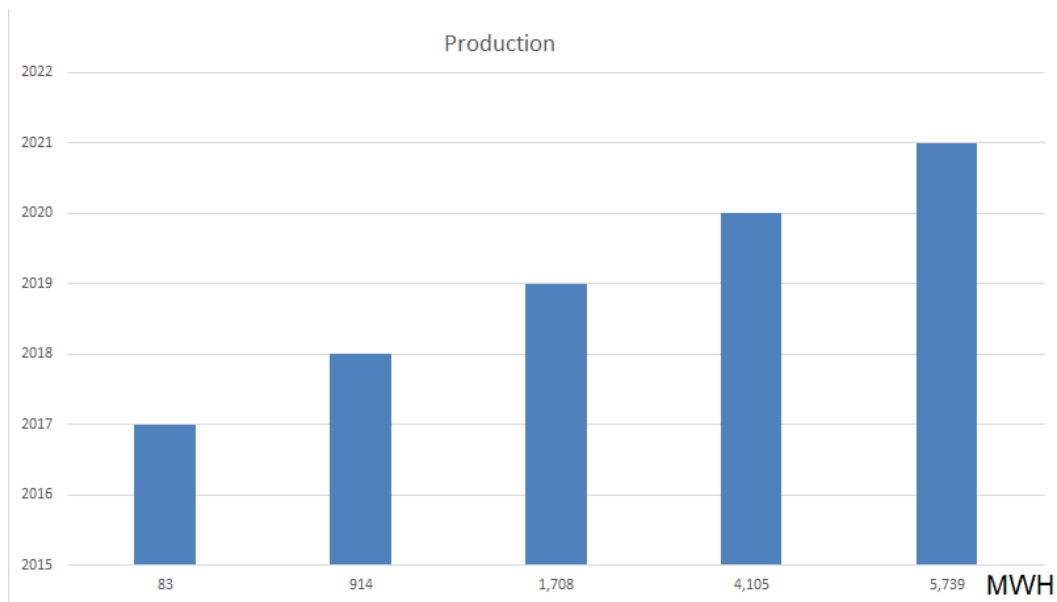


Figure (3.15): Electricity produced from PV system in the city of Hebron.

The amount of electricity production through solar energy systems increases during the summer, when the sun's rays persist for long periods of time. The following Fig. (3.16) shows the amount of energy produced in the city of Hebron for the year 2021, as it is clear from the graph that the most periods during which electricity is produced are during the 5th to the 9th month

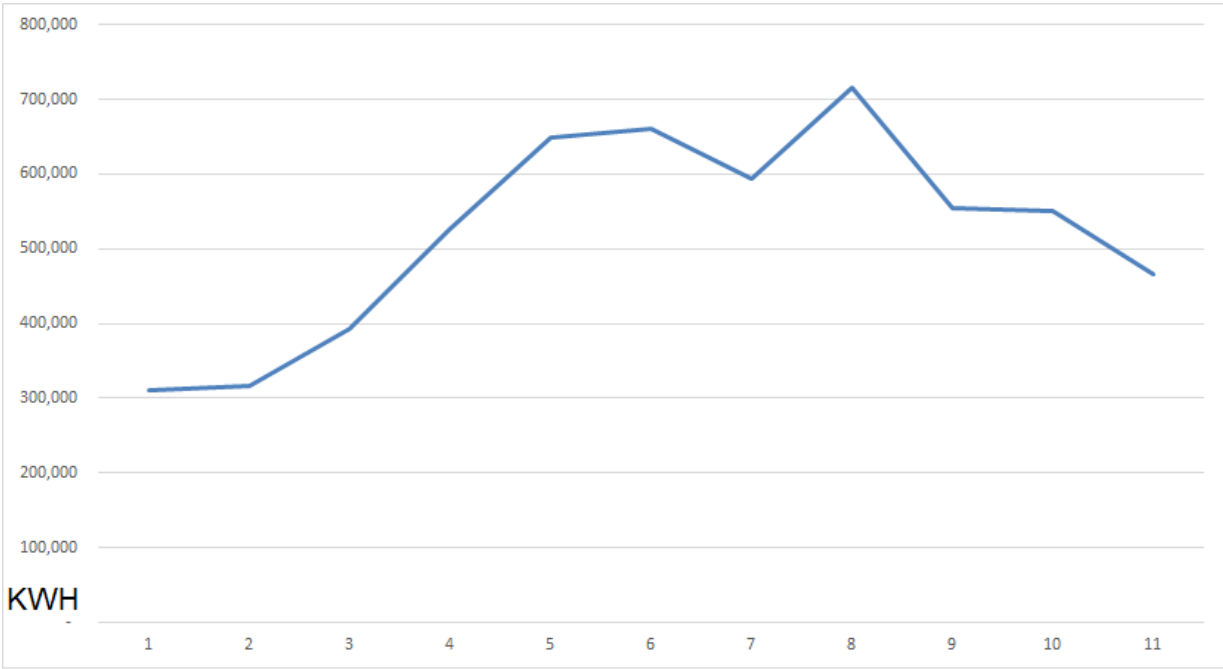


Figure (3.16): Electricity produced from PV system per month in the Hebron city.

4.1 Introduction

Demand forecasting is an essential prerequisite of an energy system study, not only for planning the investment in the capacity expansion, but also because it plays an important role for setting tariffs and relevant plans for the demand side management. As a result, energy demand forecasting studies constitute a vital part of the energy policy of any city, especially for those cities, like Hebron, whose energy demand is growing relatively fast. Due to its developing economic structure, Hebron's energy demand, especially for electricity, has been increasing quickly as a result of its economic growth in recent years. Gross electricity load consumption was around 75 MVA in 2017. It increased to around 82 MVA in 2021, and according to the government projections, **it will be 370 TWh in 2025**. This situation shows that the electricity sector in Hebron is dynamically changing as occurs in many other developing countries in a similar situation.

The effect of the unexpected economic fluctuations, the perceived shortages in the natural gas supplies and the high dependency of the power generation system on this resource, results in an electrical energy cost increase and demand fluctuation in the short term. However, long term forecasting does not require observing the short-term fluctuations of the many variables that affects energy demand, including those associated to political changes. Therefore, for the long term, instead of complex models, a more practical approach is needed in order to estimate the energy demand of any country or city. Hence, in this work we propose a simple model of interpolation that requires the use of only a few macro variables of the past years for determining the long-term variation of the energy demand. This model is applied to the electrical energy sector in the Hebron city case, as an example, so that some policy recommendations are made at the end.

4.2 Electrical Energy Demand in Hebron

The Evaluation and improvement of the substation, Feeders and distribution network performance in the electrical systems leads to increased reliability in the service; it also leads to high financial return that encourages investment in this field. Studies show that 30\% to 40\% of the investment in the electricity sector is spent on substation distribution system.

Therefore, it is necessary to evaluate the electrical network and then study the electrical loads that expected to grow in the coming years in Hebron city, so that future planning can be done appropriately by finding a set of solutions. In addition, the solar energy plans in the city must be studied to know the amount of solar energy that will be produced during the coming years.

In this project, based on the accurately obtained data for the electrical network loads, these data were analyzed and reliable mathematical equations were obtained to estimate the amount of electrical loads on the electrical network until the year 2050. These future data can be relied upon in order to work good planning for the future of all electrical stations in the city of Hebron. MATLAB and Excel were used to analyze the data, get the mathematical equations, and then get graphs for all electrical network loads.

The following Figures show the expected electrical loads for electrical stations in the city of Hebron until 2050

Fig. (4.1) show that the amount of electrical loads expected to be present on the Alduhdah substation until the year 2050, as is clear from the fiugure, the amount of electrical loads increases gradually so that the amount of electrical loads on the station in 2017 is equal to 12 MW, and the amount of electrical loads on the station reaches In 2050 to approximately 32 MW, and therefore the amount of increase in the load increased by 3 times than it was in 2017.

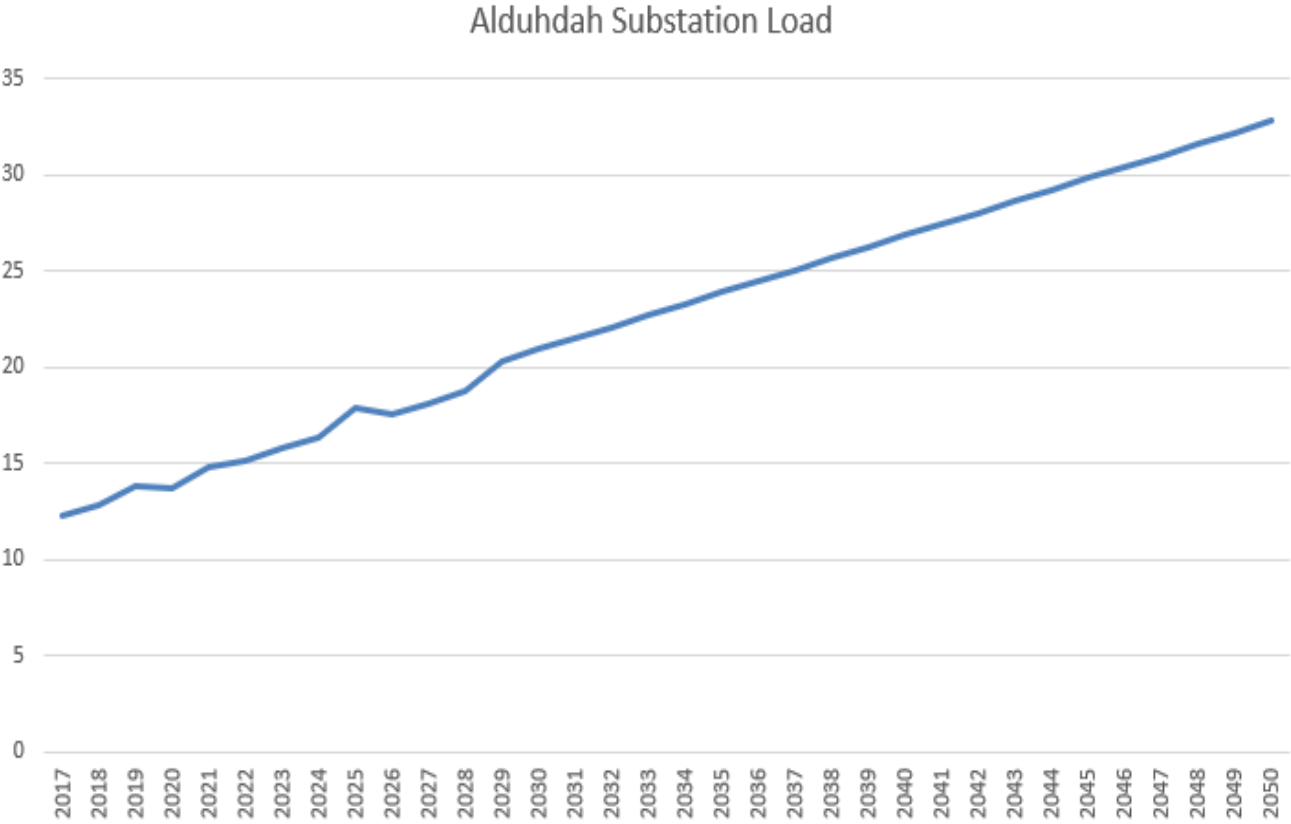


Figure (4.1): Alduhdah Substation load 2017-2050.

Fig. (4.2) display the amount of electrical loads on Alras substation during 23 years. So that through the data of electrical loads during the last period of time, these data were analyzed and the estimated amount of electrical loads that will be on the electrical station until the year 2050 was obtained. As it is clear from the picture, the amount of electrical loads during 2017 was estimated at 11 MW, and it became estimated in 2050 at 30 MW, and therefore the headquarters of the increase in electrical loads is estimated to be 3 times what the electrical loads were in 2017.

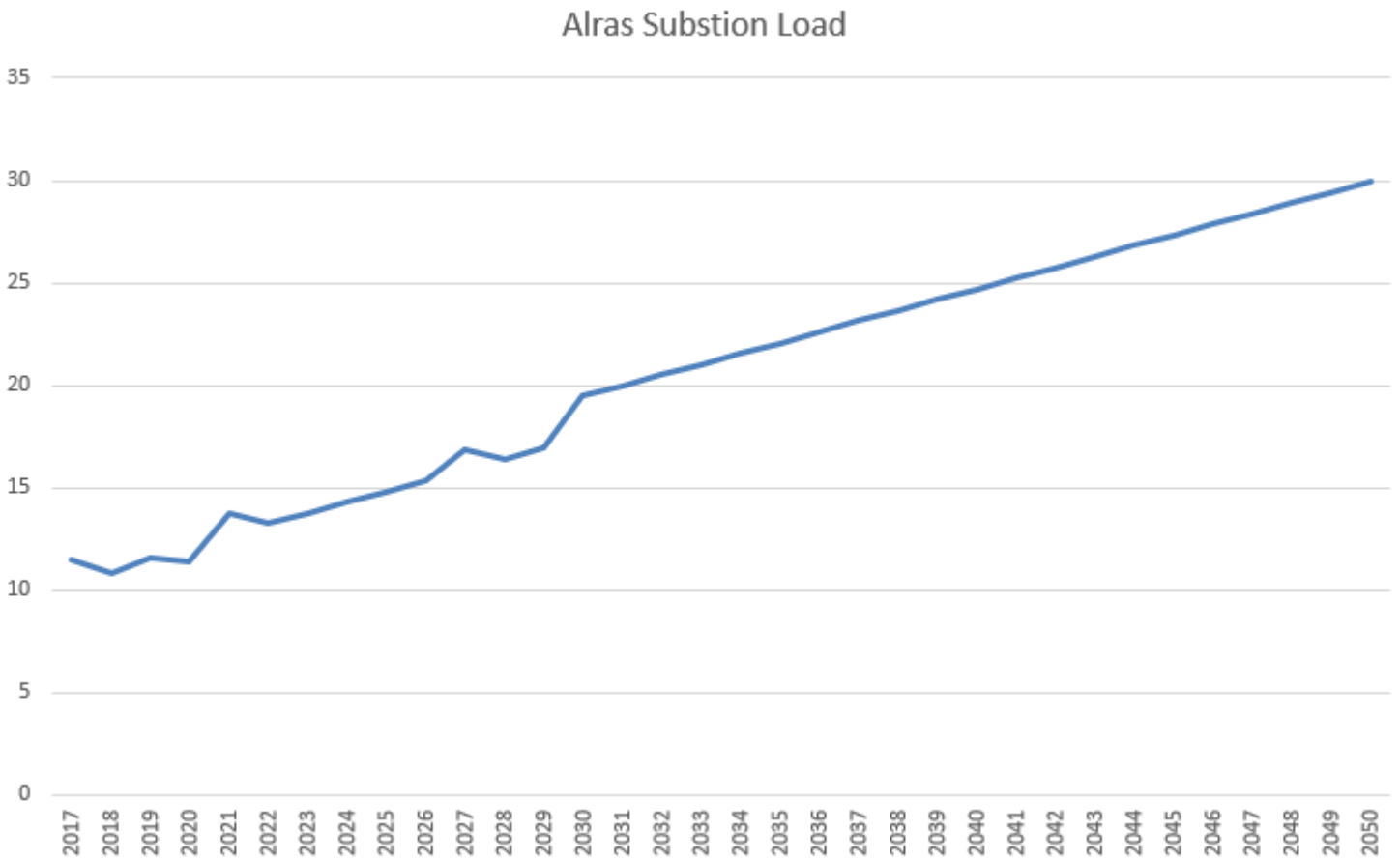


Figure (4.2): Alras Substation load 2017-2050.

The West Station will be the second largest electrical station in Hebron. Fig. (4.3) shows the amount of electrical loads expected to be present on the electrical network of the station by the year 2050. So that this data was obtained during the analysis of the electrical station loads data for the previous years, and through it the receiving data of the electrical loads was obtained. The amount of electrical loads on the electrical station in 2017 is estimated at about 10 MW, and by 2050, the amount of these electrical loads on the electrical station will become 60 MW. Therefore, the amount of increase is estimated to be 6 times than it was in 2017.

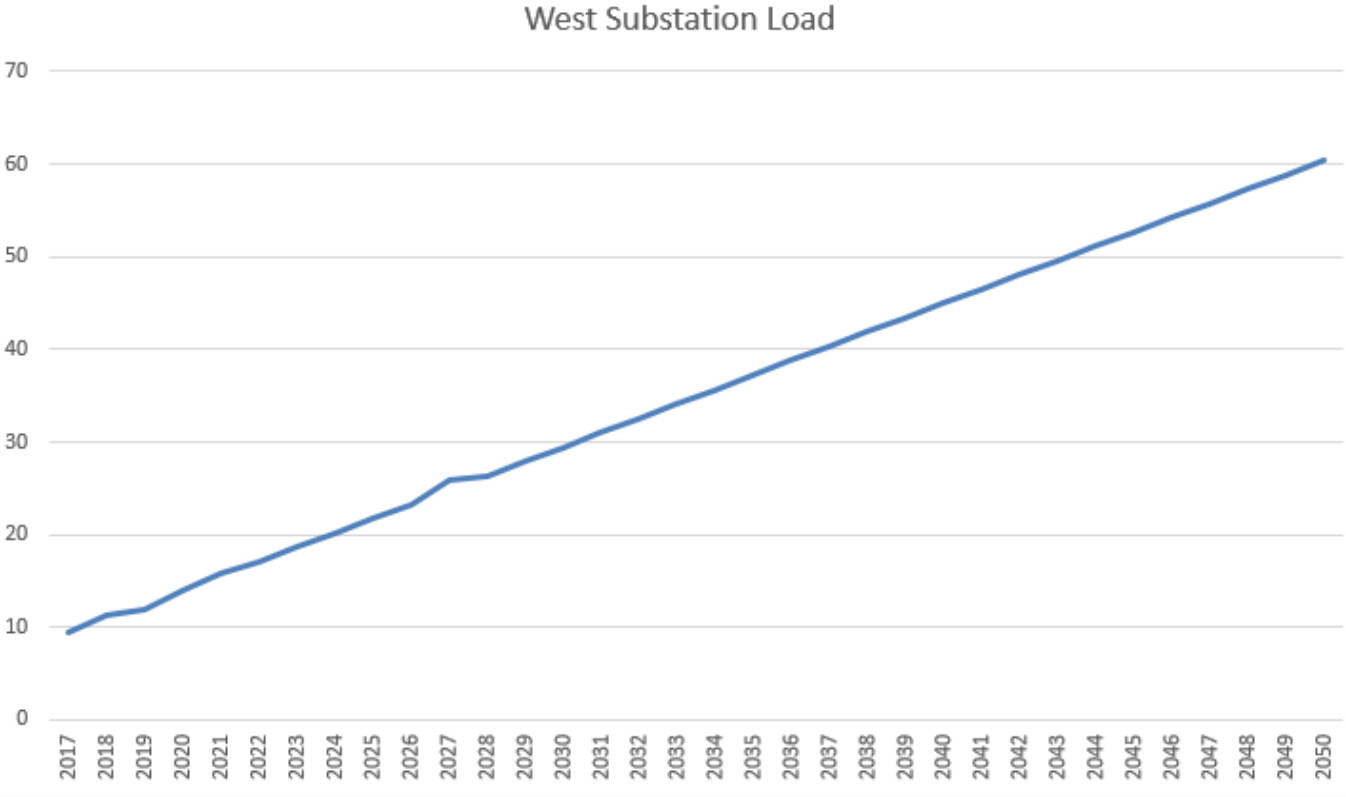


Figure (4.3): West Substation load 2017-2050.

Fig. (4.4) show that the amount of electrical loads expected to be present on the Alharayeq substation until the year 2050, as is clear from the fiugure, the amount of electrical loads increases gradually so that the amount of electrical loads on the station in 2017 is equal to 10 MW, and the amount of electrical loads on the station reaches In 2050 to approximately 35 MW, and therefore the amount of increase in the load increased by 3.5 times than it was in 2017.

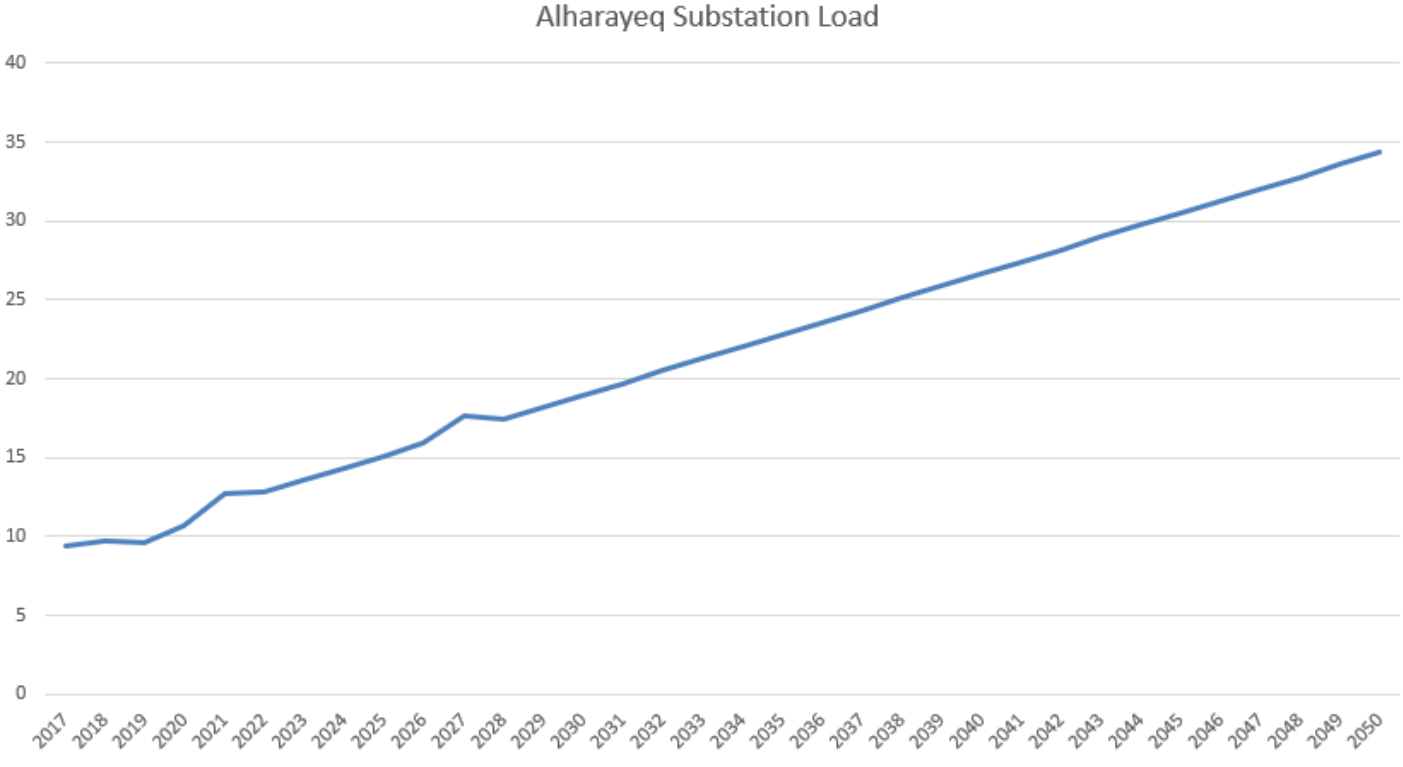


Figure (4.4): Alharayeq Substation load 2017-2050.

Fig. (4.5) display the amount of electrical loads on Alfahs substation during 23 years. So that through the data of electrical loads during the last period of time, these data were analyzed and the estimated amount of electrical loads that will be on the electrical station until the year 2050 was obtained. As it is clear from the picture, the amount of electrical loads during 2017 was estimated at 13 MW, and it became estimated in 2050 at 38 MW, and therefore the headquarters of the increase in electrical loads is estimated to be 3.5 times what the electrical loads were in 2017.

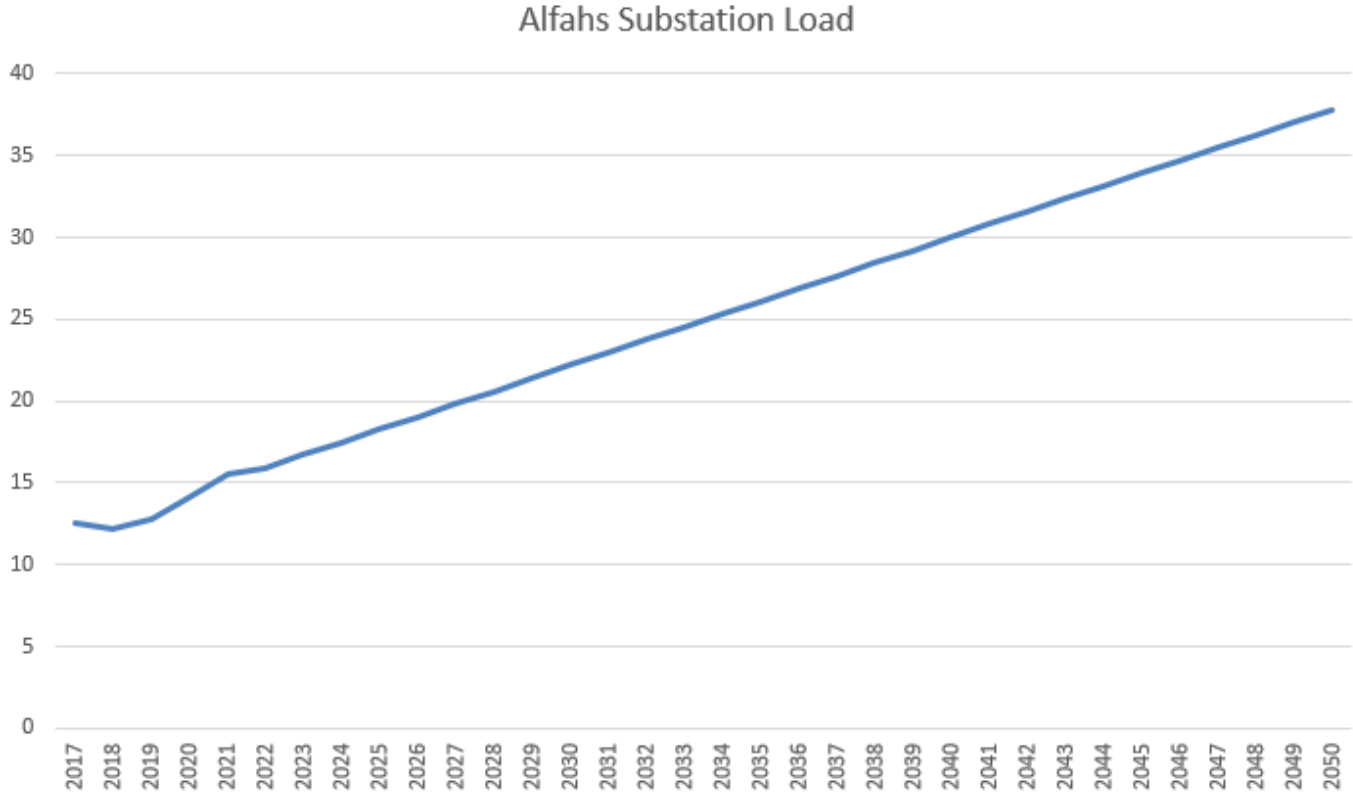


Figure (4.5): Alfahs Substation load 2017-2050.

Alhusan substation will be the third largest electrical station in Hebron. Fig. (4.6) shows the amount of electrical loads expected to be present on the electrical network of the station by the year 2050. So that this data was obtained during the analysis of the electrical station loads data for the previous years, and through it the receiving data of the electrical loads was obtained. The amount of electrical loads on the electrical station in 2017 is estimated at about 18 MW, and by 2050, the amount of these electrical loads on the electrical station will become 55 MW. Therefore, the amount of increase is estimated to be 3 times than it was in 2017.

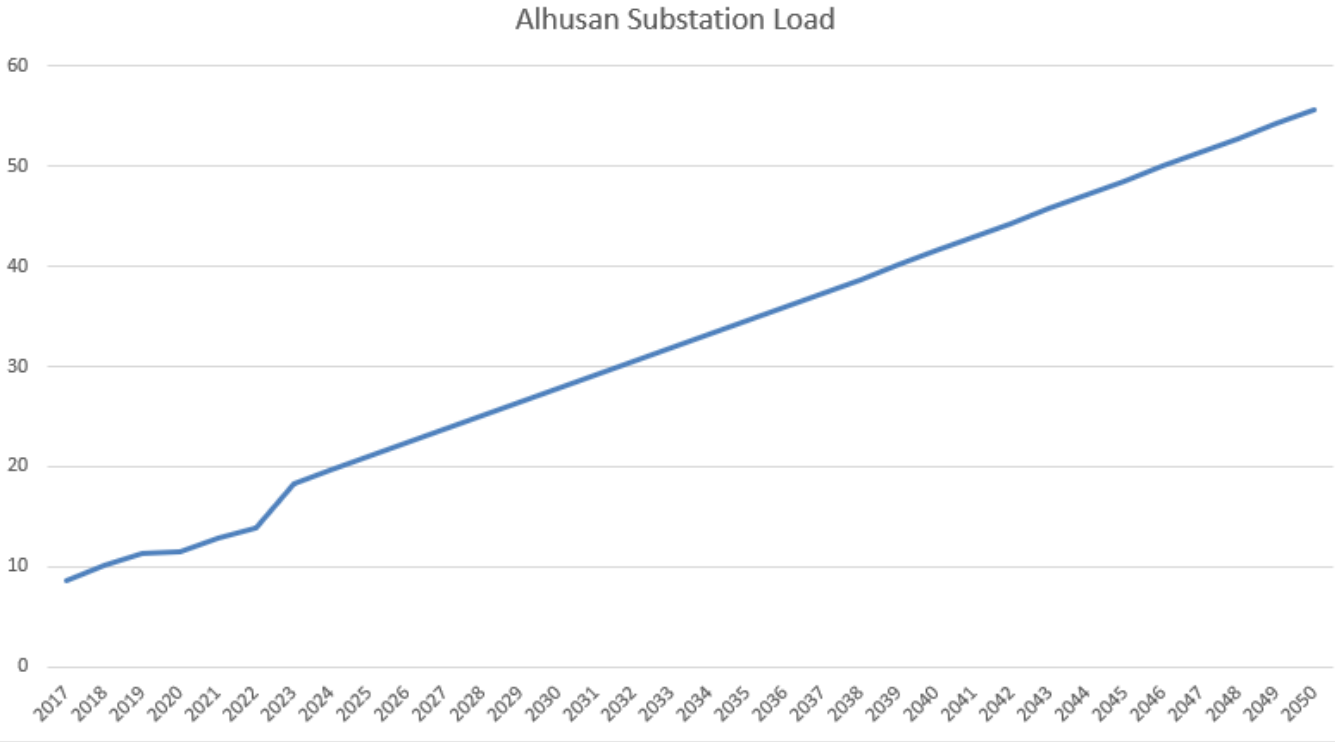


Figure (4.6): Alhusan Substation load 2017-2050.

Umaidalyeh substation will be the largest electrical station in Hebron. Fig. (4.7) shows the amount of electrical loads expected to be present on the electrical network of the station by the year 2050. So that this data was obtained during the analysis of the electrical station loads data for the previous years, and through it the receiving data of the electrical loads was obtained. The amount of electrical loads on the electrical station in 2017 is estimated at about 7 MW, and by 2050, the amount of these electrical loads on the electrical station will become 88 MW. Therefore, the amount of increase is estimated to be 10 times than it was in 2017.

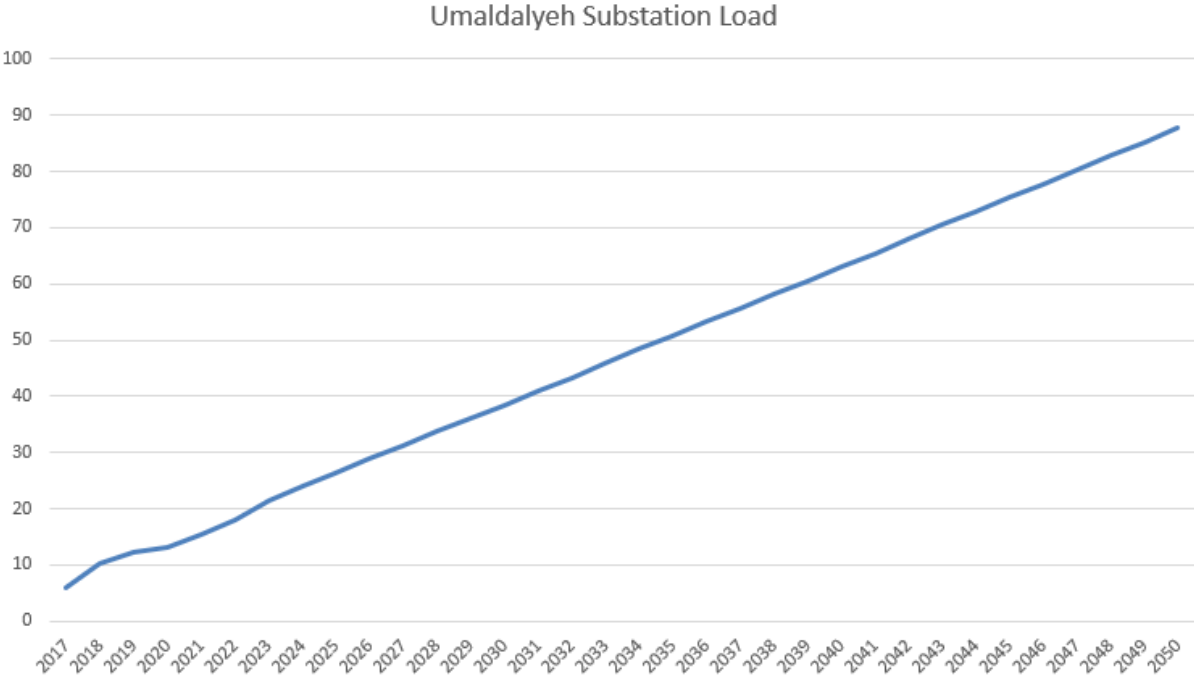


Figure (4.7): Umaidalyeh Substation load 2017-2050.

It is necessary to know the amount of the highest electrical load on the network and the lowest electrical load on the electrical network, in order to plan well for the future of the electrical stations, in order to ensure that the electrical loads are within the extent of accommodating the electrical stations. The following picture shows the amount of less work on the stations of the city of Hebron during the time period (2017-2030).

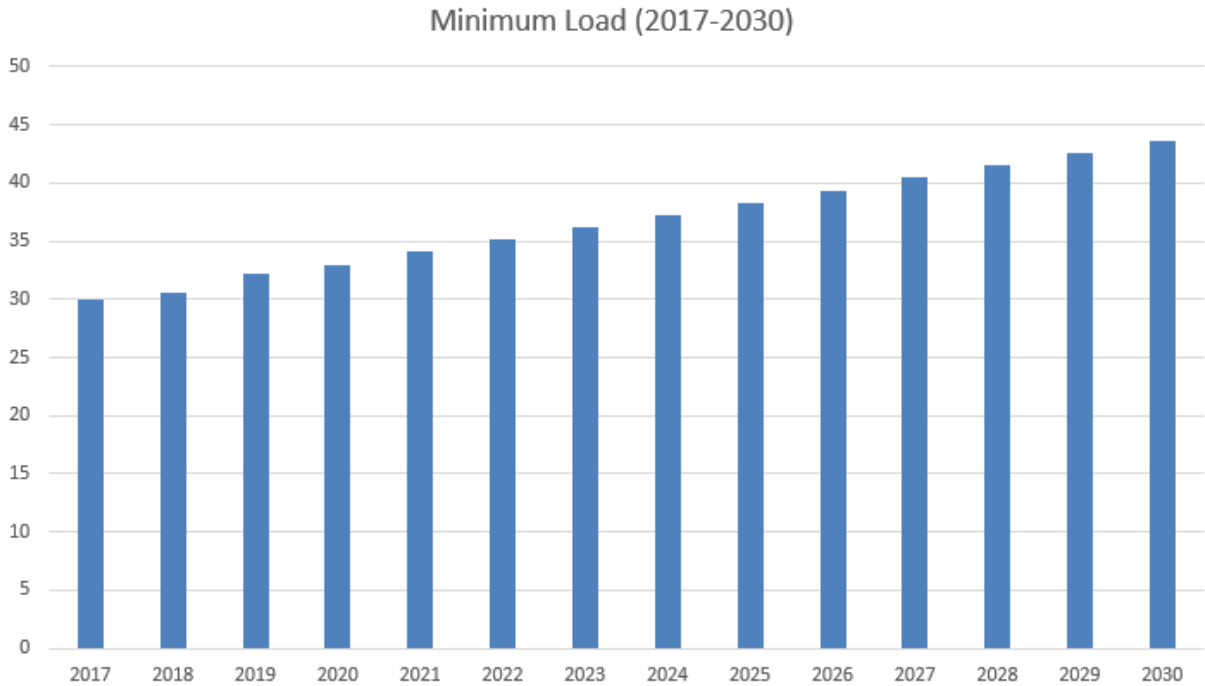


Figure (4.8): Minimum Load (2017-2030).

Through the data that obtained for the highest electrical loads on the electrical network in the city of Hebron, the amount of the highest electrical loads on the stations of the city of Hebron was estimated during the time period (2017-2030) in Fig. (5.9). So that the highest electrical load on the grid in 2030 was estimated at 95 MW, while the highest load on the electrical grid in 2017 was at 75 MW, it is necessary to know the amount of the highest electrical load on the electrical grid in order to plan the electrical network appropriately.

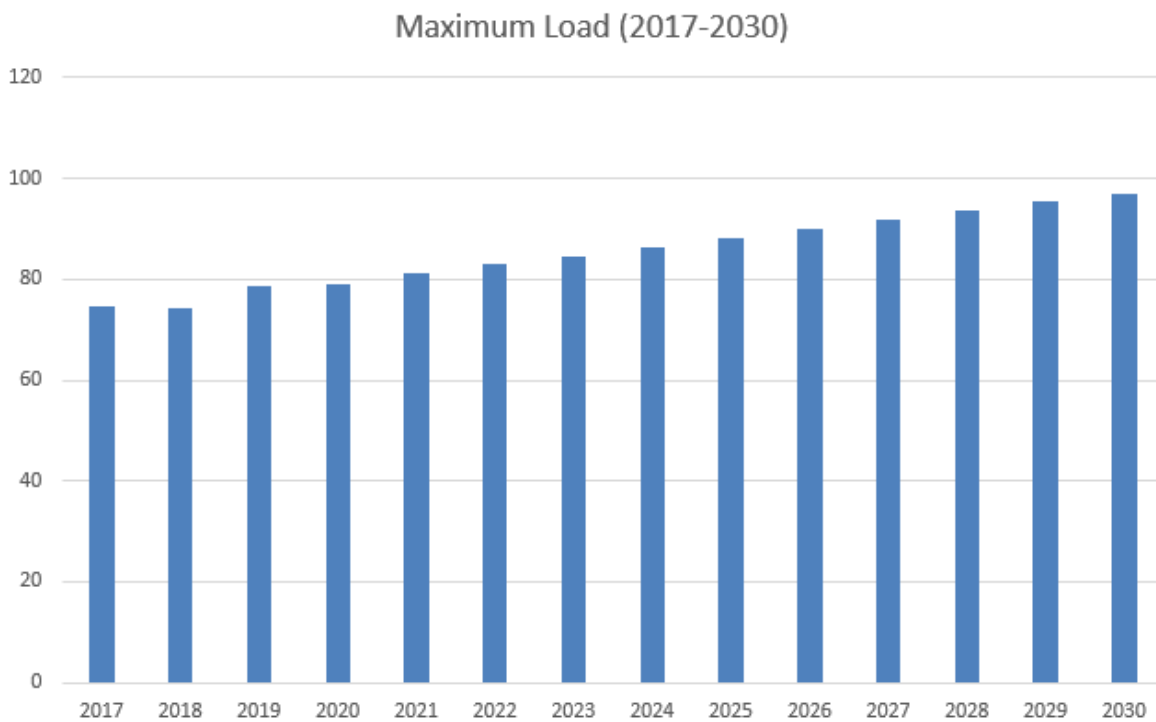


Figure (4.9): Maximum Load (2017-2030).

Fig. (4.9) illustrate the amount of electrical energy that will be produced in the city of Hebron during the time period within (2017-2050), as based on the amount of energy produced through solar cells during the time period 2017-2021, mathematical equations were built in order to estimate the amount of electrical energy that will be produced through solar energy until the year 2050. Based on Fig. (5.9), the amount of electrical energy produced during 2017 was estimated at 83 MWH, and by 2050, the amount of electrical energy expected to be produced is estimated at 47000 MWH. The amount of energy produced is very large and therefore it is necessary to plan to take advantage of this energy produced all this energy produced in the city of Hebron.

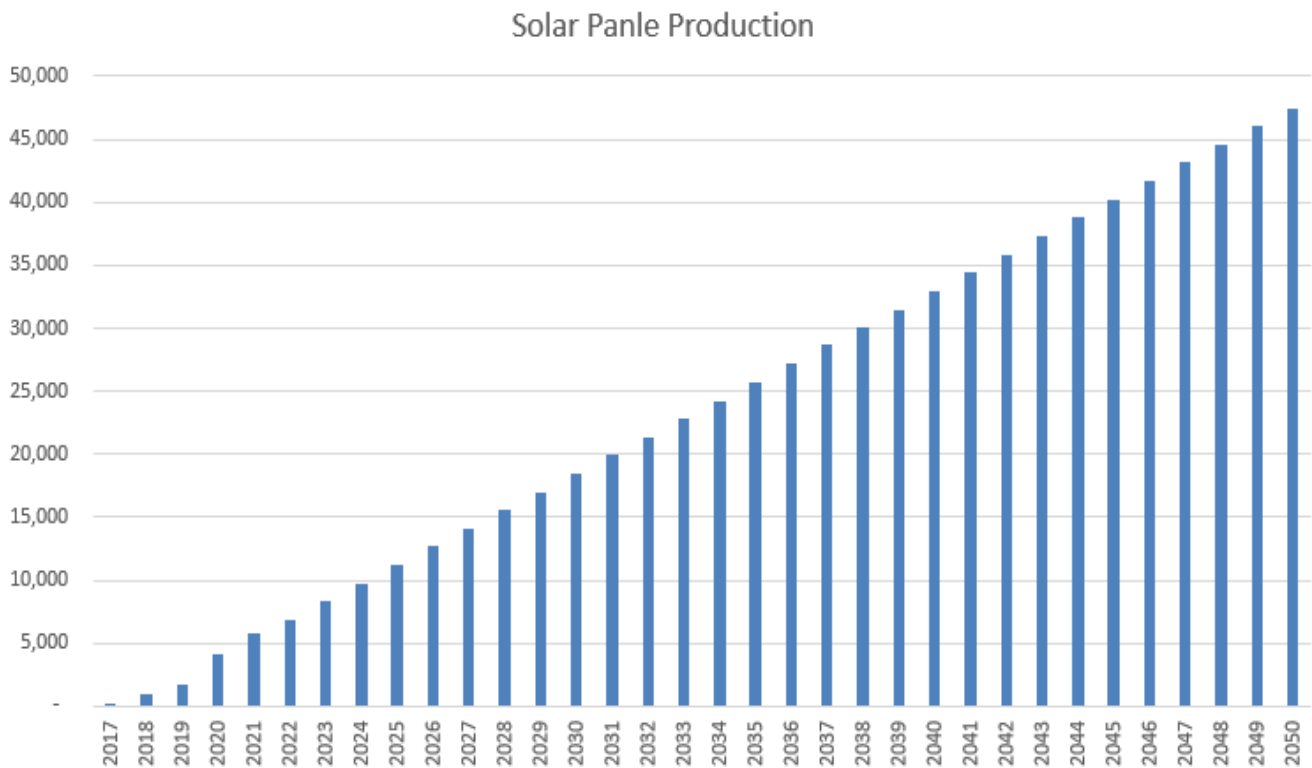


Figure (4.9): Solar panel production (2017-2050).

4.3 Development and Improvement for Hebron Distribution Network

Based on the data that obtained for the amount of electrical loads on each substation located in the network of the Hebron city, In order to improve the performance of the Hebron electricity network, all the cables, transformers and switchgears data were collected and entered in real value on the ETAP program as shown in tables (4.1) and Fig. (4.10).

Table (4.1): Lengths of Distribution Networks

Conductors	Quantity (km)
Underground 11kV Cupper Cable 50 mm ²	5.96
Underground 11kV Cupper Cable 120 mm ²	4.295
Underground 33kV Aluminum Cable 300 mm ²	8.670
Underground 33kV Cupper Cable 300mm	28
Underground 11kV Cupper Cable 150 mm ²	117.120
Underground 11kV Aluminum Cable 95mm ²	0.930
Total	243.069

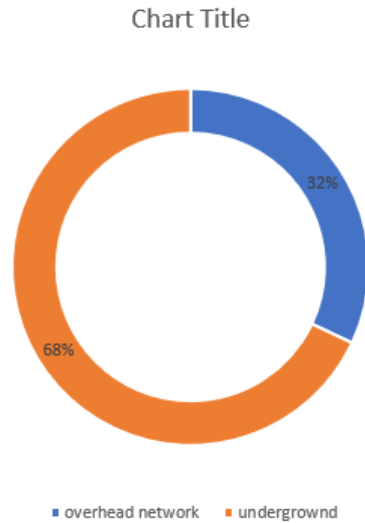


Fig. (4.10): Percentages for overhead and underground networks.

4.3.1 Scenario 2 : Improve the performance of Al alduhdah Station

In order to improve the performance of alduhdah Station, the cables, transformers and switchgears data were collected as in table (4.2).

Table (4.2) Lengths of Distribution Networks for industrial area

Conductors	Quantity (km)
Underground 33kV Aluminum Cable 300 mm ²	4.7
Underground 11kV Copper Cable 150 mm ²	10.074
Overhead Network 11kV	15.35
Total	30.124

It is important to improve the performance of Alduhdah station for the following reasons:

1. There are 4.7 km of aluminum underground cables which lead to high losses.
2. The maximum load can be transferred by the cable is 21 MVA while the capacity of the transformers in the substation is 30 MVA.
3. The continuous interruptions in an important area in the city of Hebron, where the main cable supplied to the station has been interrupted several times.

To improve the performance of the Alduhdah station, the following solutions are required:

1. Add a new main cable from the South or from the MPC station to the Alduhdah station to use the full capacity.
2. Change the design of the station so that new circuit breakers and couplers are added to the stations as in Fig. (4.11).

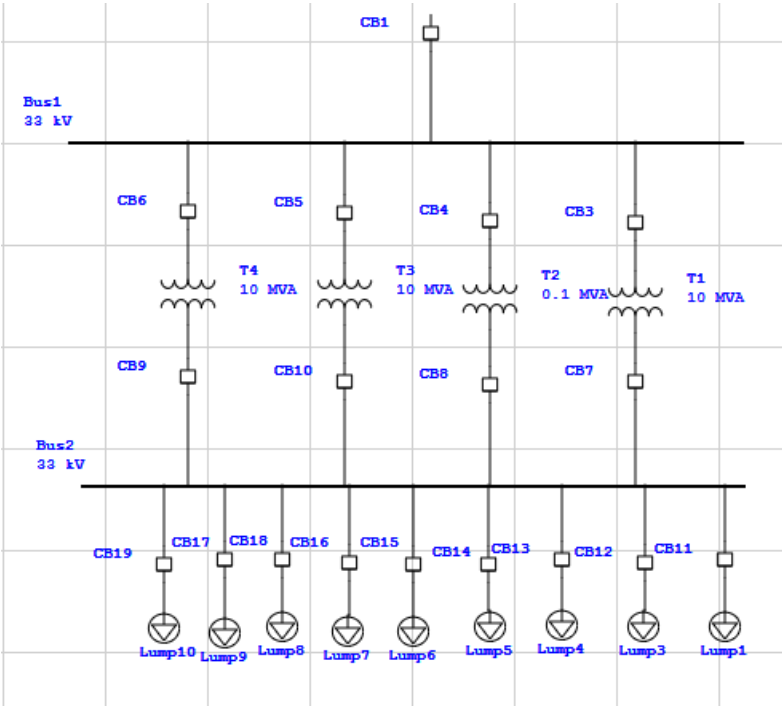


Fig. (4.11): Alduhdah station before change.

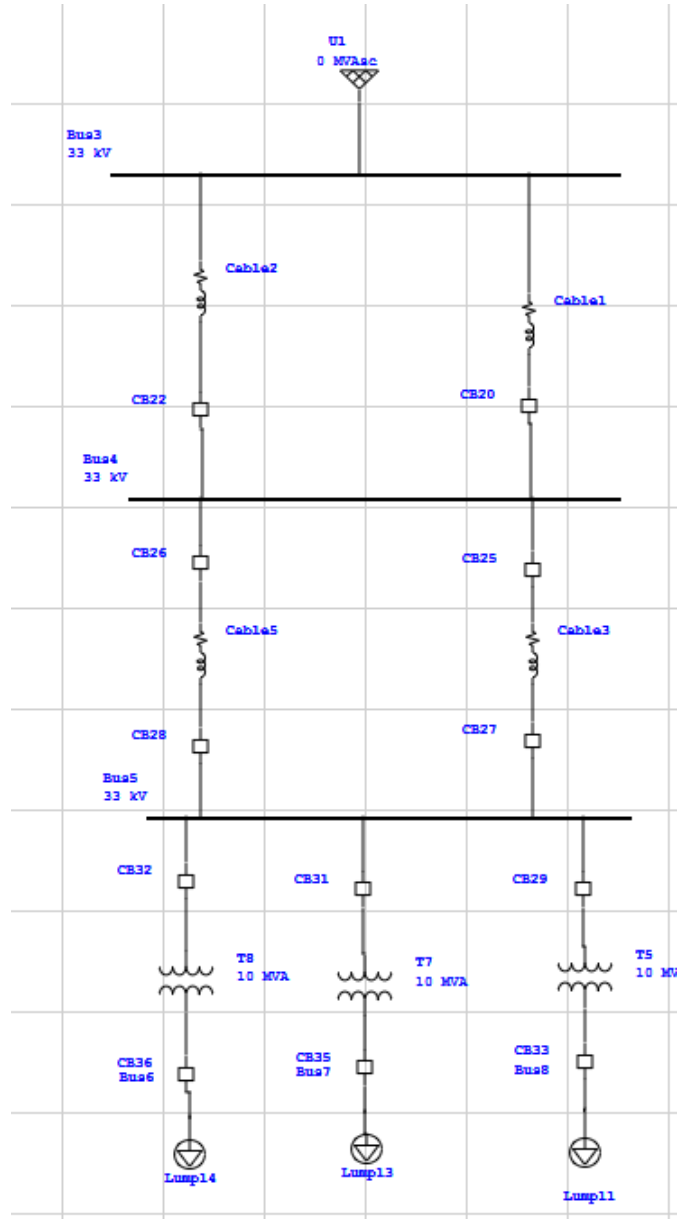


Fig. (4.12): Alduhdah station after change.

Reduce losses by note that:

1. The rated current 420 Ampere as in appendix A.
2. The cross section of the cable $3*(1*300 \text{ Cu}) \text{ mm}^2$ as in appendix A.

For the New Circuit after change:

- Reinforcement the main cable for the Alfahs Station by adding new copper cable from MPC Station.
- Specifications:
 - ✓ The rated current 525 Ampere as in appendix B.
 - ✓ The cross section of the cable $3*(1*300)$ mm²

After analysis on the ETAP, it was found that the losses of the main feeder cable when loading the Al-Fahs station in the industrial zone at peak hours are 406 kW as it shown in the table in appendix A.

4.3.2 Scenario 2: 33kV Hebron network

Using the ETAP power program, the real values of the network components and the required values were entered and the maximum load time of 2020 was selected. The results showed a loss of 1066.6 kW, which means 1% of the total load as shown in Fig. (4.13) and in appendix B.

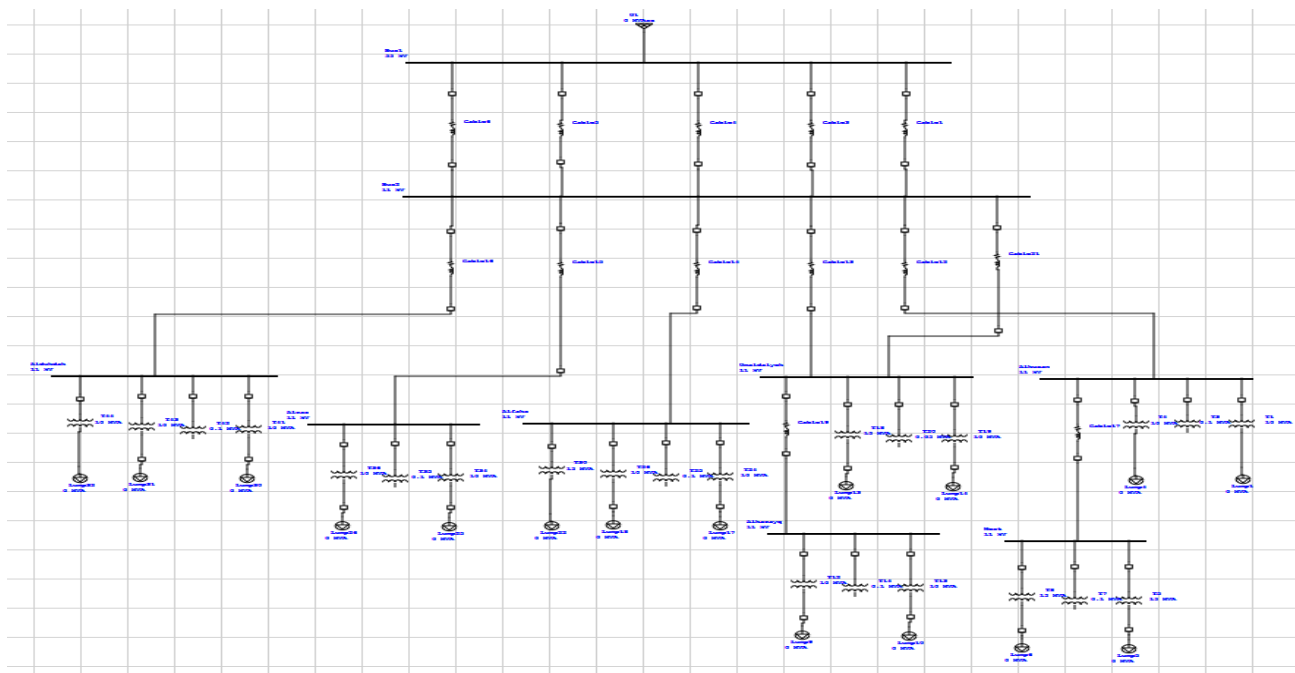


Figure (4.13): Single line Diagram for Hebron 33kV Network from ETAP.

In addition, the network was analyzed at different times as in the following table (4.3).

Table (4.3): Network analysis at different times

Type	Date	Load(MVA)	Losses(kW)
Average load	10.6.2020	78.4	771.8
summer	4.7.2021	96.1	943
Winter	22.12.2021	120	15778.6

4.3.2.1 Effect of adding new Main Points

The effect of operating new link points on a network was simulated so that loads were distributed to all main stations (15MVA to every station) and the losses were reduced to 1066kW as in appendix B which means reducing losses by 22.6% as in figure (4.14).

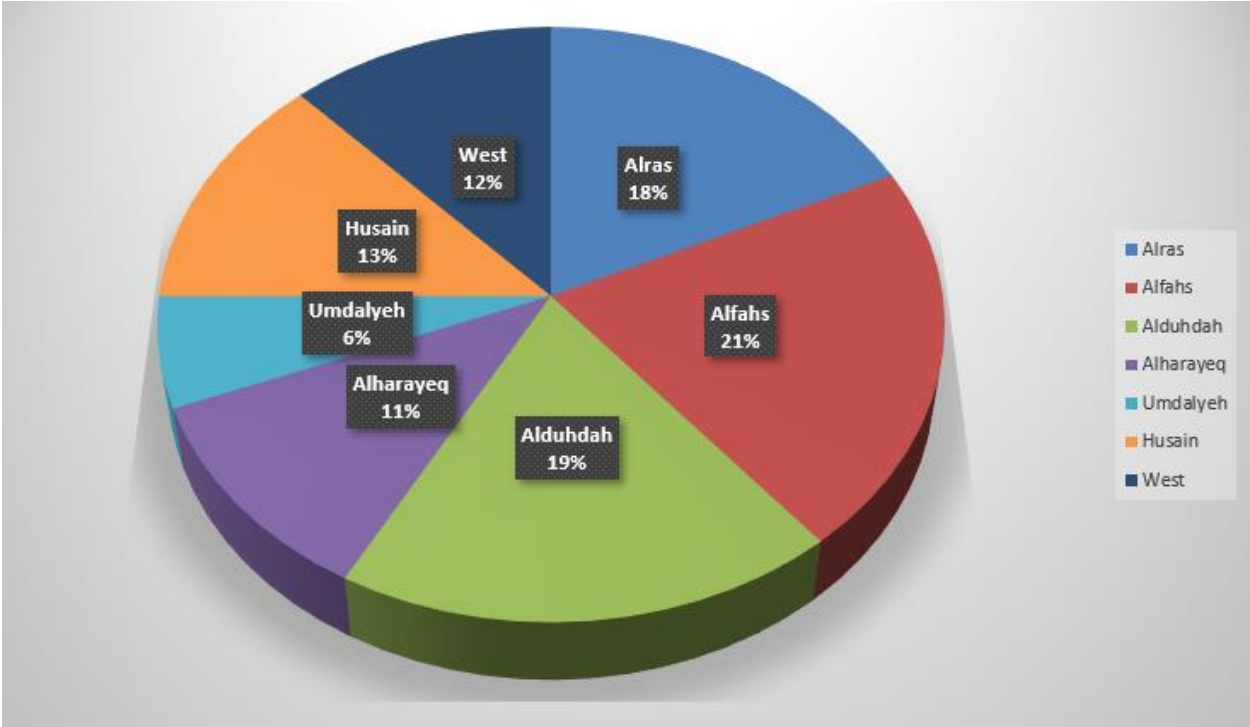


Figure (4.14) Percentage of Power consumption for each Station 2021.

Recommendations

- Connect smart meters to all distribution transformers in order to monitor and manage loads
- Workshop on the utility of improving the power factor of the consumer.
- There is a need for development studies using network analysis programs.
- Use GIS to collect and archive network contents.

References

- [1] Website of the Palestinian Energy Authority : <http://www.penra.gov.ps>,2017
- [2] Hadi Saadat,"*Power System Analysis*",TataMc Graw- Hill Education,2nd Edition,Indian,2002.
- [3] SCADA system . , Hebron Electric.
- [4] Hebron Municipality,Annual Report for Hebron Electric,2020.

Appendix A

Project: LOSSES 15MVA
 Location:
 Contract:
 Engineer:
 Filename: ss

ETAP

Study Case: LF

Page: 1
 Date: 30-4-2022
 SN:
 Revision: Base
 Config.: Normal

Branch Losses Summary Report

CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Alfas	-12.864	-7.979	12.971	8.070	106.7	90.4	98.8	99.8	0.90
T11	4.204	2.813	-4.188	-2.595	16.8	218.1	98.8	96.3	2.58
T12	4.204	2.813	-4.188	-2.595	16.8	218.1	98.8	96.3	2.58
T14	4.455	2.352	-4.445	-2.153	10.0	199.6	98.8	96.9	1.94
Cable1	14.060	5.578	-14.043	-5.644	17.7	-65.5	100.0	99.8	0.18
Cable2	14.238	5.150	-14.216	-5.207	21.7	-57.0	100.0	99.8	0.20
Cable3	13.000	8.095	-12.971	-8.070	29.3	24.9	100.0	99.8	0.25
Cable4	14.191	5.515	-14.169	-5.572	21.9	-56.6	100.0	99.8	0.20
Cable5	13.820	6.332	-13.798	-6.389	21.9	-56.7	100.0	99.8	0.21
Cable9	13.104	7.726	-13.075	-7.702	29.0	24.5	100.0	99.8	0.25
Cable10	13.974	6.237	-13.945	-6.212	29.3	24.8	100.0	99.8	0.24
Husan+west	14.043	5.644	-14.022	-5.720	21.0	-76.8	99.8	99.6	0.21
umaldaleh+haraeq	14.216	5.207	-14.151	-5.441	65.0	-234.0	99.8	99.2	0.64
alras	14.169	5.572	-14.161	-5.601	8.2	-29.4	99.8	99.7	0.08
alduhdah	13.798	6.389	-13.741	-6.593	57.4	-204.0	99.8	99.2	0.59
Cable11	13.945	6.212	-13.915	-6.188	29.3	24.8	99.8	99.5	0.24
umaldaleh mpc	13.075	7.702	-13.012	-7.987	62.4	-285.0	99.8	99.1	0.68
T3	6.832	3.386	-6.794	-2.894	37.8	491.9	99.2	96.1	3.12
T31	6.909	3.207	-6.872	-2.716	37.8	490.9	99.2	96.2	2.97
T8	-7.043	-2.315	7.081	2.800	37.3	485.5	97.1	99.7	2.62
T9	7.081	2.800	-7.043	-2.315	37.3	485.5	99.7	97.1	2.62
alharayeq	14.151	5.441	-14.107	-5.595	44.5	-154.6	99.2	98.7	0.44
T19	-7.016	-2.306	7.053	2.798	37.8	491.8	96.1	98.7	2.64
T20	7.053	2.798	-7.016	-2.306	37.8	491.8	98.7	96.1	2.64
T22	-5.440	-3.371	5.457	3.712	17.0	340.9	96.1	99.1	3.00
west	14.022	5.720	-13.983	-5.860	39.1	-140.1	99.6	99.2	0.39
T23	-7.506	-3.635	7.555	4.275	49.2	639.2	95.2	99.1	3.89
T25	-6.802	-2.898	6.840	3.388	37.7	489.8	96.4	99.5	3.12
T26	7.075	2.800	-7.038	-2.313	37.4	486.7	99.5	96.9	2.63
T28	-7.040	-2.314	7.062	2.763	22.4	448.8	97.0	99.2	2.26
T29	6.921	3.098	-6.892	-2.724	28.8	374.0	99.2	97.0	2.25
					1066.3	5182.2			

Appendix B

Project: ALDUHDAH SUBTATION BEFORE IMPROVMENT

ETAP

Page: 1

Location:

12.6.0H

Date: 17-4-2022

Contract:

SN:

Engineer:

Study Case: LF

Revision: Base

Filename: ss

Config.: Normal

Branch Losses Summary Report

CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
alfahs	-19.446	-12.768	19.701	12.985	255.3	216.4	98.2	99.6	1.40
T11	5.983	4.174	-5.948	-3.714	35.3	459.4	98.2	94.4	3.81
T12	6.995	4.126	-6.960	-3.670	35.0	455.4	98.2	95.2	3.05
T14	6.468	4.469	-6.436	-3.829	32.0	639.9	98.2	93.6	4.66
Cable1	0.000	0.000	0.000	0.000			100.0	100.0	
Cable2	0.000	-0.086	0.000	0.000	0.0	-86.1	100.0	100.0	0.00
Cable3	19.771	13.044	-19.701	-12.985	70.2	59.5	100.0	99.6	0.39
Cable4	0.000	-0.086	0.000	0.000	0.0	-86.1	100.0	100.0	0.00
Cable5	0.000	-0.086	0.000	0.000	0.0	-86.1	100.0	100.0	0.00
Cable598	0.000	-0.094	0.000	0.000	0.0	-93.7	100.0	100.0	0.00
Cable600	0.000	0.000	0.000	0.000			100.0	100.0	
Cable498	1.801	1.239	-1.792	-1.232	8.9	7.1	93.6	93.1	0.49
Cable504	2.541	1.593	-2.539	-1.591	1.9	1.5	93.6	93.5	0.08
Cable511	2.094	0.997	-2.093	-0.996	0.4	0.3	93.6	93.5	0.02
Cable527	1.311	0.940	-1.310	-0.939	0.8	0.6	94.4	94.3	0.06
Cable538	1.585	1.068	-1.584	-1.067	0.9	0.7	94.4	94.3	0.06
Cable565	3.052	1.707	-3.046	-1.702	6.0	4.8	94.4	94.2	0.21
Cable546	0.727	0.430	-0.726	-0.429	0.8	0.6	95.2	95.0	0.11
Cable548	3.136	0.967	-3.134	-0.966	1.5	1.2	95.2	95.1	0.05
Cable612	3.097	2.273	-3.094	-2.271	3.1	2.4	95.2	95.1	0.10
Cable608	0.066	0.042	-0.066	-0.043	0.0	-0.9	93.1	93.1	0.00
Line225	1.673	1.413	-1.672	-1.412	1.3	0.7	93.1	93.0	0.06
عز نبروخ	0.053	0.037	-0.053	-0.037	0.4	0.6	93.1	92.0	1.04
Cable500	1.447	1.219	-1.445	-1.220	1.6	-0.4	93.0	92.9	0.08
سميح شريف	0.111	0.106	-0.107	-0.101	3.8	5.7	93.0	89.0	4.03
فواز غيث	0.113	0.087	-0.111	-0.083	2.1	3.1	93.0	90.7	2.32
Cable610	0.067	0.025	-0.067	-0.025	0.0	0.0	92.9	92.9	0.00
Line227	1.225	1.079	-1.225	-1.079	0.7	0.4	92.9	92.9	0.05
صبيح شاور	0.153	0.116	-0.151	-0.114	1.5	2.2	92.9	91.7	1.24
Line229	1.147	0.992	-1.146	-0.992	0.6	0.4	92.9	92.8	0.04
مازن غيث	0.078	0.087	-0.077	-0.085	0.9	1.3	92.9	91.6	1.24
Line231	1.009	0.812	-1.008	-0.812	0.4	0.3	92.8	92.8	0.04
Line232	0.138	0.180	-0.137	-0.180	0.0	0.0	92.8	92.8	0.01
محتسب	0.137	0.180	-0.132	-0.172	5.3	7.9	92.8	88.9	3.89
Line234	0.820	0.642	-0.820	-0.642	0.3	0.2	92.8	92.8	0.03

CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
الإيدي العامله	0.144	0.125	-0.142	-0.121	2.3	3.5	92.8	90.8	1.98
شركة المستقبل	0.044	0.045	-0.043	-0.044	0.6	1.0	92.8	91.1	1.66
Cable502	0.060	0.022	-0.060	-0.022	0.0	0.0	92.8	92.8	0.00
Line236	0.446	0.492	-0.445	-0.492	0.2	0.1	92.8	92.7	0.03
Line244	0.315	0.128	-0.315	-0.128	0.2	0.0	92.8	92.7	0.05
محمدشفيق النبروخ	0.060	0.022	-0.060	-0.022	0.3	0.4	92.8	92.2	0.55
Line238	0.270	0.280	-0.270	-0.280	0.0	0.0	92.7	92.7	0.01
الشهامة	0.176	0.212	-0.171	-0.205	4.9	7.3	92.7	89.8	2.96
Line240	0.217	0.227	-0.217	-0.227	0.0	0.0	92.7	92.7	0.01
احمد شرباتي	0.052	0.052	-0.052	-0.051	0.6	0.8	92.7	91.5	1.25
Line242	0.150	0.160	-0.150	-0.160	0.0	0.0	92.7	92.7	0.01
شركة الرواد	0.067	0.067	-0.065	-0.065	1.4	2.2	92.7	90.2	2.50
Line241	0.047	0.054	-0.047	-0.054	0.0	0.0	92.7	92.7	0.00
نادر ابوقويدر	0.054	0.061	-0.053	-0.060	0.4	0.6	92.7	91.8	0.87
يحيى محمد	0.049	0.045	-0.049	-0.045	0.3	0.4	92.7	92.0	0.70
نضال زلوم	0.047	0.054	-0.047	-0.053	0.5	0.8	92.7	91.5	1.23
Line245	0.228	0.058	-0.228	-0.058	0.0	0.0	92.7	92.7	0.01
اجنادين	0.087	0.071	-0.086	-0.069	1.3	1.9	92.7	90.9	1.85
Line246	0.211	0.045	-0.210	-0.045	0.1	-0.1	92.7	92.7	0.04
حمدي الحداد	0.017	0.013	-0.017	-0.013	0.1	0.1	92.7	92.2	0.54
اختر الصرصوريه	0.210	0.045	-0.207	-0.040	3.0	4.5	92.7	91.0	1.65
Line247	0.597	0.505	-0.597	-0.505	0.1	0.1	93.5	93.5	0.02
Line249	1.842	1.251	-1.841	-1.249	1.3	1.6	93.5	93.4	0.08
عمر ابوشرخ قيسي	0.101	0.098	-0.099	-0.096	1.2	1.9	93.5	92.0	1.47
Cable505	0.429	0.360	-0.429	-0.362	0.4	-2.5	93.5	93.4	0.06
Cable507	0.017	0.015	-0.017	-0.018	0.0	-2.6	93.5	93.5	0.00
ماهر الجعري	0.150	0.130	-0.149	-0.127	0.8	2.7	93.5	92.3	1.11
ابراهيم الحموري	0.083	0.098	-0.083	-0.096	0.8	1.3	93.4	92.3	1.09
ابوحمادالحموري	0.188	0.124	-0.184	-0.119	3.2	4.8	93.4	91.2	2.21
شحده الزين	0.158	0.140	-0.156	-0.138	1.8	2.7	93.4	92.0	1.39
عيد الجولاني	0.017	0.018	-0.017	-0.018	0.0	0.1	93.5	93.2	0.26
Line250	1.353	0.834	-1.352	-0.834	0.3	0.4	93.4	93.4	0.03
عبدالصمداالاطرش	0.488	0.415	-0.471	-0.391	16.6	24.9	93.4	89.2	4.18
Line252	0.017	0.023	-0.017	-0.023	0.0	0.0	93.4	93.4	0.00
Line253	1.157	0.639	-1.157	-0.639	0.2	0.3	93.4	93.3	0.02
سامر القواسمه	0.007	0.005	-0.007	-0.005	0.0	0.0	93.4	93.0	0.35
يوسف الصاحب	0.171	0.166	-0.169	-0.163	2.3	3.4	93.4	91.8	1.58

Project: ALDUHDAH SUBTATION BEFORE IMPROVMENT

ETAP

Page: 3

Location:

12.6.0H

Date: 17-4-2022

Contract:

SN:

Engineer:

Study Case: LF

Revision: Base

Filename: ss

Config.: Normal

CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Line255	0.056	0.057	-0.056	-0.057	0.0	-0.1	93.3	93.3	0.00
Line256	1.015	0.517	-1.015	-0.516	0.5	0.5	93.3	93.3	0.06
الاطرش عام	0.086	0.065	-0.085	-0.064	0.7	1.1	93.3	92.3	1.09
Line257	0.963	0.468	-0.963	-0.467	0.4	0.4	93.3	93.2	0.05
نصار عمرو	0.052	0.049	-0.051	-0.048	0.3	0.5	93.3	92.5	0.74
Line258	0.835	0.387	-0.835	-0.387	0.1	0.1	93.2	93.2	0.01
حلمي السعيد	0.127	0.080	-0.126	-0.078	1.4	2.2	93.2	91.8	1.47
Line260	0.792	0.356	-0.791	-0.355	0.8	0.9	93.2	93.1	0.13
عبد العزيز ابوترك	0.043	0.031	-0.043	-0.031	0.1	0.2	93.2	92.9	0.34
Cable509	0.219	0.110	-0.219	-0.110	0.1	0.0	93.1	93.1	0.03
بيرين	0.572	0.245	-0.566	-0.224	6.1	21.5	93.1	91.0	2.07
القبة كوكا كولا	0.219	0.110	-0.218	-0.106	1.2	4.2	93.1	92.0	1.11
Line262	0.202	0.216	-0.202	-0.216	0.0	0.0	93.5	93.5	0.01
Line263	1.892	1.043	-1.891	-1.042	1.2	1.5	93.5	93.5	0.08
بكري وابوترك	0.065	0.038	-0.065	-0.037	0.6	0.9	93.5	92.4	1.15
حسن حلو	0.031	0.038	-0.031	-0.037	0.1	0.2	93.5	93.1	0.42
نصر حلو	0.105	0.140	-0.102	-0.137	2.5	3.7	93.5	91.1	2.37
Line268	1.635	0.878	-1.633	-0.876	2.2	2.7	93.5	93.3	0.16
المسلخ	0.255	0.164	-0.254	-0.157	1.8	6.3	93.5	91.9	1.51
133	1.562	0.857	-1.561	-0.856	0.8	1.0	93.3	93.2	0.06
Line264	0.071	0.019	-0.071	-0.019	0.0	0.0	93.3	93.3	0.00
شمس الزعري	0.036	0.007	-0.036	-0.007	0.1	0.1	93.3	93.1	0.18
نور الدين الزعري	0.034	0.011	-0.034	-0.011	0.1	0.2	93.3	92.8	0.49
Line269	1.354	0.724	-1.353	-0.723	0.6	0.7	93.2	93.2	0.05
مجمع الحرف1	0.207	0.132	-0.206	-0.128	1.2	4.2	93.2	92.0	1.22
Line270	1.145	0.592	-1.145	-0.592	0.2	0.3	93.2	93.1	0.03
مجمع الحرف2	0.208	0.131	-0.206	-0.127	2.5	3.7	93.2	91.6	1.53
Cable512	0.008	0.004	-0.008	-0.004	0.0	0.0	93.1	93.1	0.00
Line271	1.129	0.577	-1.128	-0.576	0.6	0.7	93.1	93.1	0.07
حسن نبروخ	0.009	0.011	-0.009	-0.011	0.0	0.0	93.1	92.9	0.24
الريو	0.008	0.004	-0.008	-0.004	0.0	0.0	93.1	93.1	0.08
Cable514	0.183	0.062	-0.183	-0.062	0.0	0.0	93.1	93.1	0.01
Line273	0.945	0.514	-0.944	-0.514	0.2	0.2	93.1	93.1	0.02
تامر الاطرش	0.183	0.062	-0.182	-0.060	1.5	2.3	93.1	92.0	1.04
Cable516	0.255	0.184	-0.255	-0.184	0.0	0.0	93.1	93.1	0.01
Cable519	0.190	0.003	-0.190	-0.002	0.0	0.0	93.1	93.1	0.01
Line265	0.427	0.290	-0.426	-0.290	0.2	0.1	93.1	93.0	0.04

Project: ALDUHDAH SUBTATION BEFORE IMPROVMENT

Location:

Contract:

Engineer:

Filename: ss

ETAP

12.6.0H

Study Case: LF

Page: 4

Date: 17-4-2022

SN:

Revision: Base

Config.: Normal

CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Line266	0.043	0.021	-0.043	-0.021	0.0	-0.1	93.1	93.1	0.00
وليد ابوتركي	0.030	0.017	-0.030	-0.016	0.2	0.3	93.1	92.2	0.82
Cable517	0.127	0.080	-0.127	-0.080	0.0	0.0	93.1	93.1	0.00
عثمان محمد وشركاه	0.128	0.104	-0.128	-0.102	0.4	1.5	93.1	92.3	0.72
محمد شريف	0.127	0.080	-0.125	-0.078	1.4	2.2	93.1	91.6	1.47
جهاد عزو جابر	0.190	0.002	-0.189	0.000	0.7	2.5	93.1	92.7	0.36
Line275	0.303	0.220	-0.303	-0.220	0.0	0.0	93.0	93.0	0.01
Line277	0.123	0.070	-0.123	-0.070	0.0	-0.1	93.0	93.0	0.01
خضري وقصراوي	0.009	0.011	-0.009	-0.011	0.0	0.0	93.0	92.6	0.37
نخلة الكركي	0.250	0.159	-0.246	-0.152	4.5	6.8	93.0	90.7	2.33
زهرايو حنديه	0.044	0.050	-0.043	-0.049	0.7	1.1	93.0	91.2	1.78
Cable521	0.033	0.021	-0.033	-0.021	0.0	0.0	93.0	93.0	0.00
طالب علي	0.090	0.049	-0.089	-0.048	0.7	1.0	93.0	92.0	0.98
مجمع الأميره	0.033	0.021	-0.033	-0.020	0.2	0.2	93.0	92.4	0.61
Line279	1.310	1.206	-1.310	-1.206	0.3	0.4	94.3	94.3	0.03
Line280	0.164	0.143	-0.164	-0.143	0.0	0.0	94.3	94.3	0.01
Line283	1.145	1.063	-1.145	-1.063	0.3	0.3	94.3	94.3	0.02
Line281	0.110	0.123	-0.110	-0.123	0.0	0.0	94.3	94.3	0.00
جهاد السليمه	0.055	0.020	-0.055	-0.020	0.2	0.3	94.3	93.8	0.50
نعمان شبانه	0.110	0.123	-0.109	-0.121	0.5	1.8	94.3	93.3	0.98
Line284	0.470	0.508	-0.469	-0.508	0.6	0.3	94.3	94.2	0.09
Line285	0.620	0.487	-0.620	-0.487	0.1	0.1	94.3	94.3	0.01
الشرياتي جرسليم	0.055	0.068	-0.055	-0.067	0.1	0.4	94.3	93.9	0.43
الشرياتي الحديثه	0.295	0.344	-0.292	-0.333	3.2	11.1	94.2	92.0	2.18
رضوان الامحتسب	0.174	0.164	-0.172	-0.161	2.3	3.4	94.2	92.6	1.57
Cable528	0.192	0.198	-0.192	-0.199	0.1	-1.3	94.3	94.3	0.02
Line287	0.428	0.289	-0.428	-0.289	0.1	0.0	94.3	94.3	0.02
غز بصل	0.192	0.199	-0.191	-0.195	1.2	4.1	94.3	93.0	1.29
Cable530	0.108	0.041	-0.108	-0.041	0.0	0.0	94.3	94.3	0.00
Cable531	0.009	0.007	-0.009	-0.007	0.0	0.0	94.3	94.3	0.00
Line289	0.311	0.241	-0.311	-0.241	0.0	0.0	94.3	94.3	0.01
ناجي الجعري	0.009	0.007	-0.009	-0.007	0.0	0.0	94.3	94.2	0.09
Line290	0.037	0.014	-0.037	-0.014	0.0	0.0	94.3	94.3	0.00
سنقرط للبلاستيك	0.039	0.013	-0.039	-0.013	0.1	0.2	94.3	93.9	0.34
سنقرط للبلاط	0.032	0.015	-0.031	-0.014	0.2	0.3	94.3	93.5	0.79
عبد المهدي سعيد	0.037	0.014	-0.037	-0.013	0.2	0.2	94.3	93.7	0.54
Line292	0.209	0.154	-0.209	-0.154	0.0	0.0	94.3	94.2	0.01

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
محدثشده العزة	0.102	0.087	-0.101	-0.085	1.1	1.7	94.3	92.9	1.37
Cable536	0.121	0.139	-0.121	-0.139	0.0	0.0	94.2	94.2	0.00
Line294	0.088	0.015	-0.088	-0.015	0.0	0.0	94.2	94.2	0.00
منصورا	0.121	0.139	-0.119	-0.136	2.1	3.2	94.2	92.3	1.94
Line295	0.088	0.015	-0.088	-0.015	0.0	0.0	94.2	94.2	0.00
Line296	0.000	0.000	0.000	0.000	0.0	0.0	94.2	94.2	0.00
جبريل ابو داود	0.088	0.015	-0.088	-0.014	0.4	0.6	94.2	93.7	0.52
Line298	1.584	1.334	-1.583	-1.333	1.0	1.2	94.3	94.3	0.07
Line299	0.165	0.059	-0.165	-0.059	0.0	0.0	94.3	94.3	0.00
Line302	1.418	1.274	-1.418	-1.273	0.6	0.8	94.3	94.2	0.05
Line300	0.018	0.013	-0.018	-0.013	0.0	0.0	94.3	94.3	0.00
ماهر ابو غريبية	0.147	0.046	-0.145	-0.042	2.4	3.5	94.3	92.3	2.01
منير ابو حنيد	0.018	0.013	-0.018	-0.013	0.0	0.0	94.3	94.1	0.18
Line304	1.208	1.140	-1.208	-1.139	0.3	0.4	94.2	94.2	0.03
محطة الاندلس	0.210	0.133	-0.206	-0.128	3.9	5.8	94.2	91.8	2.41
Line305	1.094	1.030	-1.093	-1.030	0.3	0.3	94.2	94.2	0.03
Line306	0.018	0.024	-0.018	-0.024	0.0	-0.1	94.2	94.2	0.00
المناصره	0.096	0.085	-0.095	-0.084	1.0	1.6	94.2	92.9	1.32
محمد خليل ابوتركه	0.018	0.024	-0.018	-0.024	0.0	0.1	94.2	94.0	0.20
Line308	0.094	0.123	-0.094	-0.123	0.0	-0.1	94.2	94.2	0.01
Line309	0.999	0.907	-0.999	-0.906	0.3	0.4	94.2	94.1	0.04
عزام ابوحمديه	0.094	0.123	-0.092	-0.119	2.4	3.6	94.2	91.5	2.63
Cable539	0.217	0.075	-0.217	-0.075	0.0	0.0	94.1	94.1	0.00
Line311	0.782	0.832	-0.782	-0.832	0.1	0.2	94.1	94.1	0.02
Cable541	0.208	0.072	-0.208	-0.072	0.0	0.0	94.1	94.1	0.00
الاسفلت	0.009	0.003	-0.009	-0.003	0.0	0.0	94.1	94.1	0.03
الفارس	0.208	0.072	-0.205	-0.067	3.0	4.5	94.1	92.3	1.85
Line313	0.304	0.293	-0.304	-0.293	0.1	0.0	94.1	94.1	0.02
Line315	0.469	0.528	-0.469	-0.528	0.1	0.1	94.1	94.1	0.02
اسعد الجعيري	0.009	0.011	-0.009	-0.011	0.0	0.0	94.1	93.7	0.36
Line314	0.225	0.203	-0.225	-0.203	0.1	0.0	94.1	94.1	0.03
زهير الحسيني	0.079	0.090	-0.078	-0.089	0.6	0.9	94.1	93.3	0.80
اطلال الحسيني	0.094	0.097	-0.093	-0.094	1.8	2.8	94.1	91.8	2.27
كفل الحسيني	0.130	0.106	-0.130	-0.104	0.5	1.9	94.1	93.1	0.91
Cable542	0.130	0.152	-0.130	-0.152	0.0	-0.7	94.1	94.1	0.01
Line317	0.228	0.282	-0.228	-0.282	0.1	0.0	94.1	94.1	0.03
طالب ابو سنينه	0.085	0.074	-0.083	-0.071	2.0	3.0	94.1	91.2	2.90

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
فريد ابو حديد	0.026	0.020	-0.026	-0.019	0.3	0.4	94.1	92.8	1.31
عبد المعز نيروخ	0.130	0.152	-0.127	-0.148	2.5	3.8	94.1	92.0	2.11
Line319	0.158	0.180	-0.158	-0.180	0.0	0.0	94.1	94.1	0.01
Line323	0.070	0.102	-0.070	-0.102	0.0	-0.1	94.1	94.1	0.01
Line320	0.114	0.152	-0.114	-0.152	0.0	0.0	94.1	94.0	0.01
نعيم الننتشه	0.044	0.029	-0.044	-0.028	0.1	0.2	94.1	93.7	0.33
Line321	0.077	0.114	-0.077	-0.114	0.0	0.0	94.0	94.0	0.00
عمر ابوشرخ	0.037	0.038	-0.037	-0.038	0.1	0.2	94.0	93.7	0.35
الانشانات	0.077	0.114	-0.076	-0.113	0.8	1.1	94.0	93.1	0.93
Cable544	0.035	0.025	-0.035	-0.026	0.0	-1.3	94.1	94.0	0.00
محمد عيسى عمرو	0.035	0.077	-0.034	-0.076	0.7	1.1	94.1	92.6	1.42
الهيوموني	0.035	0.026	-0.035	-0.026	0.1	0.2	94.0	93.6	0.44
Line325	0.673	0.408	-0.673	-0.408	0.2	0.1	95.0	95.0	0.03
ماجد ابوميله	0.053	0.022	-0.053	-0.021	0.5	0.8	95.0	93.8	1.25
Line327	0.584	0.352	-0.584	-0.352	0.2	0.1	95.0	95.0	0.03
مفرق الضاحية	0.089	0.056	-0.088	-0.054	1.1	1.6	95.0	93.4	1.61
Cable550	0.089	0.039	-0.089	-0.039	0.0	0.0	95.0	95.0	0.02
Line329	0.406	0.264	-0.406	-0.264	0.3	0.1	95.0	94.9	0.08
محول بنر عيس	0.089	0.049	-0.088	-0.048	0.8	1.2	95.0	93.8	1.20
خلة مناع	0.089	0.039	-0.088	-0.037	0.9	1.4	95.0	93.6	1.37
Line331	0.357	0.214	-0.357	-0.214	0.1	0.0	94.9	94.9	0.04
ماجد أبو اسنينة	0.049	0.050	-0.047	-0.048	1.2	1.8	94.9	92.0	2.89
Line333	0.189	0.104	-0.188	-0.105	0.2	-0.4	94.9	94.7	0.12
عبدالمعطي ابوتركي	0.018	0.014	-0.018	-0.014	0.1	0.1	94.9	94.3	0.58
وادالسمن	0.151	0.095	-0.149	-0.092	2.0	2.9	94.9	93.1	1.71
Line335	0.062	0.024	-0.062	-0.025	0.0	-0.2	94.7	94.7	0.01
عقبة انجيله	0.126	0.080	-0.124	-0.077	2.2	3.3	94.7	92.4	2.30
Line337	0.018	0.006	-0.018	-0.006	0.0	-0.4	94.7	94.7	0.01
مسجد حسن البنا	0.044	0.019	-0.044	-0.019	0.2	0.3	94.7	94.0	0.69
بويرت زيف	0.018	0.006	-0.018	-0.006	0.0	0.1	94.7	94.5	0.25
شبكة المجد	3.134	1.237	-3.103	-1.198	30.7	39.6	95.1	93.9	1.22
كيبيل طارق - محمدعلي	3.103	1.198	-3.096	-1.191	7.9	6.3	93.9	93.6	0.27
Cable552	0.341	0.118	-0.341	-0.118	0.1	0.1	93.6	93.6	0.02
Cable554	2.331	0.879	-2.328	-0.878	2.2	1.8	93.6	93.5	0.10
مدرسة أحمد	0.424	0.194	-0.419	-0.179	4.3	14.9	93.6	91.6	1.99
مدرسة القدس	0.341	0.118	-0.336	-0.110	5.2	7.9	93.6	91.7	1.94
Cable555	0.513	0.228	-0.513	-0.228	0.1	0.1	93.5	93.5	0.02

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Cable558	1.815	0.650	-1.813	-0.648	2.5	2.0	93.5	93.4	0.14
Cable556	0.170	0.075	-0.170	-0.075	0.0	0.0	93.5	93.5	0.02
مسجد المحسنين	0.343	0.153	-0.340	-0.145	2.2	7.7	93.5	92.2	1.28
خلة القيه	0.170	0.075	-0.168	-0.072	2.2	3.3	93.5	91.8	1.67
Cable560	1.386	0.513	-1.385	-0.512	0.9	0.8	93.4	93.3	0.07
جبل الضاحية1	0.427	0.135	-0.424	-0.124	3.2	11.1	93.4	92.1	1.30
Cable561	0.961	0.321	-0.961	-0.321	0.4	0.4	93.3	93.2	0.05
جبل الضاحية2	0.424	0.191	-0.420	-0.179	3.4	11.9	93.3	91.7	1.59
Line341	0.535	0.187	-0.534	-0.187	0.3	0.2	93.2	93.2	0.07
الكساره	0.426	0.134	-0.423	-0.123	3.2	11.0	93.2	92.0	1.30
Line343	0.211	0.073	-0.211	-0.073	0.1	-0.1	93.2	93.1	0.04
جبل جالس	0.323	0.114	-0.321	-0.105	2.3	8.1	93.2	91.9	1.31
خلة النتش	0.211	0.073	-0.208	-0.068	3.2	4.8	93.1	91.2	1.90
Line345	3.046	1.968	-3.044	-1.965	2.2	2.8	94.2	94.1	0.09
Line347	3.016	1.948	-3.012	-1.943	4.0	5.2	94.1	93.9	0.16
شركة البنقيه	0.028	0.018	-0.028	-0.017	0.1	0.2	94.1	93.6	0.51
Line349	2.922	1.830	-2.921	-1.828	1.2	1.6	93.9	93.9	0.05
احمد الحربايو	0.089	0.113	-0.088	-0.112	0.8	1.2	93.9	93.0	0.97
Line350	0.559	0.449	-0.559	-0.449	0.1	0.0	93.9	93.9	0.02
Line360	2.363	1.379	-2.362	-1.378	0.8	1.0	93.9	93.9	0.04
Line351	0.083	0.052	-0.083	-0.052	0.0	-0.1	93.9	93.9	0.01
Line355	0.475	0.397	-0.475	-0.397	0.1	0.1	93.9	93.9	0.02
انريس	0.083	0.052	-0.083	-0.051	0.6	0.9	93.9	92.9	0.95
Line352	0.098	0.102	-0.098	-0.102	0.0	0.0	93.9	93.9	0.01
Line354	0.077	0.099	-0.077	-0.099	0.0	0.0	93.9	93.9	0.01
Line357	0.300	0.197	-0.300	-0.197	0.1	0.0	93.9	93.8	0.03
هائي غيث	0.098	0.102	-0.097	-0.100	1.3	1.9	93.9	92.4	1.48
اسحق الشرباتي	0.016	0.011	-0.016	-0.011	0.1	0.1	93.9	93.4	0.47
السلامه	0.061	0.088	-0.061	-0.087	0.6	0.9	93.9	92.9	0.91
Line358	0.143	0.048	-0.143	-0.048	0.0	0.0	93.8	93.8	0.01
فيصل ابوسنينه	0.157	0.148	-0.154	-0.144	2.9	4.4	93.8	91.6	2.24
Line353	0.057	0.001	-0.057	-0.001	0.0	0.0	93.8	93.8	0.00
الارتباط القواسمه	0.086	0.048	-0.086	-0.046	1.0	1.5	93.8	92.3	1.49
الامير	0.057	0.001	-0.056	0.000	0.5	0.8	93.8	93.0	0.85
Line362	0.226	0.052	-0.226	-0.052	0.0	0.0	93.9	93.8	0.01
Line366	2.081	1.271	-2.080	-1.270	0.9	1.2	93.9	93.8	0.06
الشركه الواعده	0.054	0.055	-0.054	-0.054	0.4	0.6	93.9	93.1	0.80

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Line364	0.183	0.003	-0.183	-0.003	0.0	0.0	93.8	93.8	0.02
راشد الزعري	0.044	0.048	-0.043	-0.048	0.3	0.4	93.8	93.2	0.69
عطا ابو رموز	0.183	0.003	-0.181	0.000	2.1	3.2	93.8	92.7	1.09
Line367	1.956	1.215	-1.954	-1.212	2.4	3.1	93.8	93.6	0.15
اكرم ابوسنينه	0.037	0.000	-0.037	0.000	0.1	0.1	93.8	93.6	0.22
شعيب منقرط	0.087	0.055	-0.086	-0.054	0.7	1.0	93.8	92.8	1.00
Line368	1.894	1.212	-1.893	-1.210	1.1	1.4	93.6	93.6	0.07
1 عبد الاطرش	0.060	0.001	-0.060	0.000	0.4	0.5	93.6	93.1	0.57
Line369	0.847	0.432	-0.847	-0.432	0.4	0.4	93.6	93.5	0.06
Line375	0.788	0.629	-0.788	-0.629	0.4	0.5	93.6	93.5	0.06
ابوداود	0.084	0.078	-0.082	-0.075	2.1	3.1	93.6	90.6	2.97
ابوزينه	0.174	0.071	-0.171	-0.068	2.2	3.3	93.6	91.9	1.65
Cable569	0.751	0.382	-0.751	-0.382	0.1	0.1	93.5	93.5	0.01
منشار الزعري	0.096	0.049	-0.095	-0.049	0.5	0.7	93.5	92.9	0.64
Cable571	0.541	0.289	-0.541	-0.289	0.1	0.0	93.5	93.5	0.01
Line401	0.178	0.094	-0.178	-0.094	0.0	-0.1	93.5	93.5	0.02
ناصر قباجة	0.032	0.000	-0.032	0.000	0.1	0.2	93.5	93.2	0.31
Line371	0.396	0.287	-0.396	-0.287	0.1	0.0	93.5	93.5	0.03
الشماء	0.145	0.002	-0.143	0.000	1.3	2.0	93.5	92.6	0.87
Line373	0.308	0.193	-0.308	-0.193	0.1	0.0	93.5	93.4	0.02
فايز غيث	0.036	0.041	-0.036	-0.041	0.3	0.5	93.5	92.5	0.93
محمدي غيث	0.052	0.052	-0.051	-0.051	0.9	1.3	93.5	91.5	1.93
Cable572	0.017	-0.001	-0.017	0.000	0.0	-0.6	93.4	93.4	0.00
Cable574	0.290	0.194	-0.290	-0.194	0.0	-0.6	93.4	93.4	0.01
عبد العظيم ابورجب	0.017	0.000	-0.017	0.000	0.0	0.0	93.4	93.3	0.10
ياسين قباجة	0.290	0.194	-0.288	-0.186	2.4	8.4	93.4	91.7	1.77
Cable577	0.788	0.629	-0.788	-0.629	0.1	0.1	93.5	93.5	0.01
Cable578	0.488	0.413	-0.488	-0.413	0.0	0.0	93.5	93.5	0.01
الباكرم الكبجي	0.300	0.216	-0.291	-0.203	8.7	13.0	93.5	89.8	3.69
Line377	0.488	0.413	-0.488	-0.413	0.1	0.0	93.5	93.5	0.02
Line379	0.314	0.256	-0.314	-0.256	0.1	0.0	93.5	93.5	0.01
غالب ابوقويد	0.174	0.157	-0.169	-0.149	5.6	8.4	93.5	89.6	3.88
Line381	0.250	0.230	-0.250	-0.230	0.0	0.0	93.5	93.5	0.01
خميس نبروخ	0.063	0.025	-0.063	-0.025	0.3	0.4	93.5	92.9	0.60
مروان الننتشة	0.250	0.230	-0.246	-0.223	4.7	7.0	93.5	91.2	2.24
Line384	0.503	0.546	-0.503	-0.546	0.2	0.1	94.7	94.6	0.02
Line388	2.579	2.162	-2.576	-2.159	2.9	2.6	94.7	94.6	0.11

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Line420	-3.082	-2.260	3.094	2.271	12.0	10.7	94.7	95.1	0.40
Line386	0.209	0.280	-0.209	-0.280	0.1	0.0	94.6	94.6	0.03
الجمال الاطرش	0.293	0.267	-0.290	-0.256	3.0	10.5	94.6	92.4	2.21
شركة التقدم	0.209	0.280	-0.204	-0.272	4.8	7.2	94.6	92.3	2.34
Cable586	0.018	0.008	-0.018	-0.009	0.0	-0.9	94.6	94.6	0.00
Line390	2.559	2.151	-2.552	-2.146	6.6	5.9	94.6	94.3	0.25
Cable594	0.088	0.055	-0.088	-0.055	0.0	-0.4	94.3	94.3	0.00
Line392	0.188	0.213	-0.188	-0.213	0.0	0.0	94.3	94.3	0.01
Line394	2.267	1.871	-2.262	-1.867	5.0	4.4	94.3	94.1	0.22
3ناجي جابر	0.009	0.007	-0.009	-0.007	0.0	0.0	94.3	94.0	0.29
Cable588	0.188	0.213	-0.188	-0.213	0.0	-0.4	94.3	94.3	0.00
Cable590	0.031	0.041	-0.031	-0.041	0.0	-0.3	94.3	94.3	0.00
Cable592	0.064	0.060	-0.064	-0.060	0.0	-0.4	94.3	94.3	0.00
شركة البناء والتطوير	0.093	0.112	-0.093	-0.111	0.8	1.3	94.3	93.3	0.98
عبدالحافظ ادريس	0.031	0.041	-0.031	-0.041	0.2	0.2	94.3	93.7	0.55
طالب ناجي جابر	0.088	0.055	-0.088	-0.054	0.5	0.8	94.3	93.5	0.80
Line396	2.244	1.858	-2.241	-1.855	3.0	2.6	94.1	94.0	0.13
عربي الرجبي	0.018	0.009	-0.018	-0.009	0.0	0.0	94.1	93.9	0.18
Line398	2.025	1.623	-2.024	-1.622	1.1	1.0	94.0	93.9	0.05
عبد الشكور الاطرش	0.121	0.121	-0.119	-0.118	1.8	2.7	94.0	92.2	1.78
محمد المناصره	0.095	0.112	-0.094	-0.110	1.4	2.0	94.0	92.4	1.55
Line399	1.871	1.489	-1.869	-1.487	2.0	1.8	93.9	93.8	0.11
ياسين غيث	0.153	0.133	-0.150	-0.128	3.3	4.9	93.9	91.3	2.65
Cable607	0.000	-0.213	0.000	0.000	0.0	-212.9	100.0	100.0	0.00
Line402	0.169	0.084	-0.169	-0.084	0.1	0.0	93.5	93.5	0.03
الديك	0.009	0.010	-0.009	-0.010	0.0	0.0	93.5	93.3	0.22
خلة ابو عصا	0.169	0.084	-0.167	-0.081	2.3	3.4	93.5	91.7	1.74
حسن الصاحب	0.017	0.023	-0.017	-0.023	0.1	0.1	93.4	92.9	0.49
موسى دعا	0.056	0.057	-0.055	-0.056	0.6	1.0	93.3	92.0	1.34
حسين الجعيري	0.043	0.021	-0.043	-0.021	0.1	0.2	93.1	92.7	0.36
Line404	1.482	1.030	-1.482	-1.029	0.5	0.5	93.8	93.8	0.04
Line405	0.112	0.116	-0.112	-0.116	0.0	0.0	93.8	93.8	0.00
الاخنف	0.274	0.342	-0.262	-0.323	12.1	18.2	93.8	89.1	4.65
عبيد غيث	0.035	0.041	-0.035	-0.040	0.3	0.4	93.8	92.9	0.91
ويلدكات	0.077	0.075	-0.076	-0.073	1.2	1.8	93.8	92.0	1.80
Line406	0.058	0.057	-0.058	-0.057	0.0	0.0	93.8	93.8	0.00
Line408	1.398	0.938	-1.398	-0.938	0.5	0.4	93.8	93.7	0.04

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
فارس غيث	0.026	0.034	-0.026	-0.033	0.3	0.4	93.8	92.6	1.14
اسماعيل ابوحمديه	0.058	0.057	-0.057	-0.057	0.3	0.4	93.8	93.2	0.54
Line409	0.054	0.054	-0.054	-0.054	0.0	0.0	93.7	93.7	0.00
Line410	0.375	0.375	-0.375	-0.375	0.0	0.0	93.7	93.7	0.01
Line411	0.793	0.450	-0.793	-0.449	0.1	0.1	93.7	93.7	0.02
سليمان جابر	0.175	0.059	-0.174	-0.057	1.4	2.1	93.7	92.7	0.99
هشلمون ورجي	0.054	0.054	-0.054	-0.053	0.4	0.5	93.7	92.9	0.80
Line412	0.190	0.254	-0.190	-0.254	0.0	0.0	93.7	93.7	0.01
سالم وعمر جابر	0.159	0.105	-0.157	-0.101	2.3	3.4	93.7	91.8	1.87
عبد الكريم داوود	0.026	0.016	-0.026	-0.016	0.1	0.2	93.7	93.0	0.75
Line413	0.217	0.096	-0.217	-0.096	0.0	0.0	93.7	93.7	0.00
Line414	0.490	0.299	-0.490	-0.299	0.1	0.0	93.7	93.7	0.01
جوال	0.087	0.054	-0.086	-0.053	0.7	1.0	93.7	92.7	1.00
خلف جابر	0.190	0.254	-0.184	-0.245	6.4	9.5	93.7	90.3	3.38
عبد العزيز ابوسمره	0.141	0.054	-0.139	-0.050	2.3	3.5	93.7	91.6	2.09
فلاح ابوحماد	0.017	0.009	-0.017	-0.008	0.1	0.1	93.7	93.3	0.45
وائل البكري	0.058	0.033	-0.058	-0.033	0.3	0.4	93.7	93.1	0.64
Cable609	0.058	0.015	-0.058	-0.017	0.0	-2.3	93.7	93.7	0.00
Line415	0.431	0.284	-0.431	-0.284	0.0	0.0	93.7	93.7	0.01
Line418	0.000	0.000	0.000	0.000	0.0	0.0	93.7	93.7	0.00
Line416	0.226	0.182	-0.226	-0.182	0.1	0.0	93.7	93.7	0.02
حميدان جابر	0.205	0.103	-0.201	-0.098	3.3	5.0	93.7	91.6	2.12
حميدان جابر2	0.087	0.043	-0.086	-0.042	0.6	0.9	93.7	92.8	0.89
شفيق غيث	0.140	0.139	-0.138	-0.137	1.6	2.3	93.7	92.3	1.31
بدر ابوحماد	0.066	0.043	-0.065	-0.040	1.6	2.4	93.1	90.0	3.09
رسمي فارس غيث	0.058	0.017	-0.058	-0.017	0.2	0.4	93.7	93.2	0.50
شركة الغفران	0.067	0.025	-0.067	-0.024	0.1	0.3	92.9	92.7	0.23
سليمان القواسمه الجعبه	-0.018	-0.009	0.018	0.009	0.1	0.1	94.1	94.6	0.45
شعيب ادريس	0.064	0.060	-0.062	-0.058	1.2	1.8	94.3	92.0	2.26
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Branch Losses Summary Report

CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Alfas	-20.253	-7.385	20.471	7.570	218.2	185.0	98.4	99.7	1.23
T11	6.272	2.051	-6.243	-1.677	28.8	374.1	98.4	96.4	2.00
T12	7.241	2.787	-7.209	-2.373	31.8	413.8	98.4	96.3	2.15
T14	6.740	2.547	-6.713	-2.012	26.8	535.1	98.4	95.7	2.69
Cable1	0.000	0.000	0.000	0.000			100.0	100.0	
Cable2	0.000	-0.086	0.000	0.000	0.0	-86.1	100.0	100.0	0.00
Cable3	20.531	7.621	-20.471	-7.570	60.0	50.9	100.0	99.7	0.34
Cable4	0.000	-0.086	0.000	0.000	0.0	-86.1	100.0	100.0	0.00
Cable5	0.000	-0.086	0.000	0.000	0.0	-86.1	100.0	100.0	0.00
Cable598	0.000	-0.094	0.000	0.000	0.0	-93.7	100.0	100.0	0.00
Cable600	0.000	0.000	0.000	0.000			100.0	100.0	
Cable498	1.901	0.469	-1.895	-0.464	6.8	5.4	95.7	95.4	0.39
Cable504	2.646	0.836	-2.645	-0.835	1.6	1.3	95.7	95.7	0.07
Cable511	2.165	0.706	-2.165	-0.706	0.4	0.3	95.7	95.7	0.02
Cable527	1.380	0.254	-1.379	-0.254	0.6	0.5	96.4	96.4	0.05
Cable538	1.653	0.362	-1.652	-0.361	0.7	0.6	96.4	96.4	0.05
Cable565	3.210	1.061	-3.205	-1.057	5.4	4.3	96.4	96.2	0.18
Cable546	0.740	0.336	-0.740	-0.335	0.7	0.6	96.3	96.2	0.10
Cable548	3.211	0.990	-3.209	-0.989	1.5	1.2	96.3	96.2	0.05
Cable612	3.258	1.047	-3.256	-1.045	2.4	1.9	96.3	96.2	0.08
Cable608	0.070	0.028	-0.070	-0.029	0.0	-0.9	95.4	95.4	0.00
Line225	1.769	0.686	-1.768	-0.685	0.9	0.5	95.4	95.3	0.05
عز نبروخ	0.056	0.022	-0.055	-0.022	0.4	0.5	95.4	94.5	0.83
Cable500	1.530	0.587	-1.528	-0.587	1.2	-0.5	95.3	95.2	0.07
سميح شريف	0.119	0.050	-0.116	-0.046	2.5	3.8	95.3	92.5	2.79
فواز غيث	0.120	0.049	-0.118	-0.047	1.6	2.4	95.3	93.5	1.79
Cable610	0.070	0.026	-0.070	-0.026	0.0	0.0	95.2	95.2	0.00
Line227	1.297	0.482	-1.296	-0.482	0.5	0.3	95.2	95.2	0.04
صبيح شاور	0.161	0.079	-0.160	-0.077	1.3	1.9	95.2	94.2	1.03
Line229	1.214	0.449	-1.213	-0.448	0.4	0.2	95.2	95.2	0.04
مازن غيث	0.083	0.033	-0.082	-0.032	0.5	0.7	95.2	94.4	0.77
Line231	1.066	0.387	-1.066	-0.387	0.3	0.2	95.2	95.1	0.03
Line232	0.147	0.061	-0.147	-0.061	0.0	0.0	95.2	95.2	0.00
محتسب	0.147	0.061	-0.145	-0.057	2.5	3.7	95.2	92.9	2.21
Line234	0.867	0.306	-0.867	-0.306	0.2	0.1	95.1	95.1	0.03

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
الإيدي العامله	0.153	0.062	-0.151	-0.060	1.7	2.5	95.1	93.7	1.43
شركة المستقبل	0.046	0.019	-0.046	-0.018	0.4	0.6	95.1	94.0	1.08
Cable502	0.063	0.023	-0.063	-0.023	0.0	0.0	95.1	95.1	0.00
Line236	0.472	0.191	-0.472	-0.191	0.1	0.0	95.1	95.1	0.02
Line244	0.332	0.092	-0.332	-0.092	0.2	0.0	95.1	95.1	0.05
محمدشفيق نبروخ	0.063	0.023	-0.063	-0.023	0.3	0.4	95.1	94.5	0.57
Line238	0.285	0.115	-0.285	-0.115	0.0	0.0	95.1	95.1	0.01
الشهبامه	0.187	0.077	-0.185	-0.073	2.5	3.8	95.1	93.3	1.76
Line240	0.229	0.092	-0.229	-0.092	0.0	0.0	95.1	95.1	0.01
احمد شرباتي	0.055	0.022	-0.055	-0.022	0.4	0.5	95.1	94.2	0.83
Line242	0.159	0.063	-0.159	-0.063	0.0	0.0	95.1	95.1	0.01
شركة الرواد	0.071	0.029	-0.070	-0.028	0.9	1.3	95.1	93.4	1.66
Line241	0.050	0.020	-0.050	-0.020	0.0	0.0	95.1	95.1	0.00
نادر ابوقويدر	0.057	0.023	-0.056	-0.022	0.2	0.3	95.1	94.5	0.53
يحيى محمد	0.052	0.021	-0.052	-0.021	0.2	0.3	95.1	94.6	0.49
فضال زلوم	0.050	0.020	-0.050	-0.020	0.3	0.4	95.1	94.3	0.75
Line245	0.239	0.054	-0.239	-0.054	0.0	0.0	95.1	95.0	0.01
اجنادين	0.092	0.038	-0.091	-0.036	1.0	1.5	95.1	93.7	1.38
Line246	0.221	0.047	-0.221	-0.047	0.1	-0.1	95.0	95.0	0.04
حمدي الحداد	0.018	0.007	-0.018	-0.007	0.1	0.1	95.0	94.6	0.42
اخو الصرصوريه	0.221	0.047	-0.218	-0.042	3.1	4.7	95.0	93.3	1.69
Line247	0.630	0.250	-0.630	-0.250	0.1	0.1	95.7	95.7	0.02
Line249	1.909	0.817	-1.908	-0.816	1.0	1.3	95.7	95.6	0.07
عمر ابوشرخ قيسي	0.106	0.043	-0.105	-0.042	0.8	1.2	95.7	94.7	0.98
Cable505	0.453	0.181	-0.453	-0.184	0.3	-2.6	95.7	95.6	0.06
Cable507	0.018	0.005	-0.018	-0.007	0.0	-2.7	95.7	95.7	0.00
ماهر الجعري	0.158	0.064	-0.158	-0.062	0.5	1.9	95.7	95.0	0.68
ابراهيم الحموري	0.088	0.035	-0.087	-0.034	0.4	0.6	95.6	95.0	0.65
ابوحماد الحموري	0.198	0.081	-0.195	-0.077	2.8	4.2	95.6	93.8	1.85
شحده الزين	0.167	0.067	-0.166	-0.065	1.2	1.9	95.6	94.6	0.98
عيد الجولاني	0.018	0.007	-0.018	-0.007	0.0	0.0	95.7	95.5	0.17
Line250	1.389	0.597	-1.389	-0.597	0.3	0.3	95.6	95.6	0.02
عبدالصمداالاطرش	0.519	0.219	-0.507	-0.200	12.2	18.3	95.6	92.5	3.10
Line252	0.018	0.007	-0.018	-0.007	0.0	0.0	95.6	95.6	0.00
Line253	1.183	0.513	-1.183	-0.513	0.2	0.2	95.6	95.6	0.02
سامر القواسمه	0.007	0.004	-0.007	-0.004	0.0	0.0	95.6	95.3	0.29
يوسف الصاحب	0.180	0.073	-0.179	-0.071	1.5	2.2	95.6	94.5	1.06

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Line255	0.059	0.024	-0.059	-0.024	0.0	-0.1	95.6	95.6	0.00
Line256	1.033	0.453	-1.033	-0.452	0.4	0.5	95.6	95.5	0.05
الاطرش عام	0.091	0.036	-0.090	-0.036	0.6	0.9	95.6	94.7	0.84
Line257	0.979	0.431	-0.978	-0.430	0.3	0.4	95.5	95.5	0.04
نصار عمرو	0.054	0.022	-0.054	-0.021	0.2	0.3	95.5	95.0	0.50
Line258	0.844	0.376	-0.844	-0.376	0.1	0.1	95.5	95.5	0.01
حلمي السعيد	0.134	0.054	-0.133	-0.053	1.3	1.9	95.5	94.2	1.25
Line260	0.799	0.358	-0.798	-0.357	0.8	0.8	95.5	95.3	0.13
عبد العزيز ابوترك	0.045	0.018	-0.045	-0.018	0.1	0.1	95.5	95.2	0.27
Cable509	0.221	0.111	-0.221	-0.111	0.1	0.0	95.3	95.3	0.03
بيرين	0.577	0.246	-0.571	-0.225	5.9	20.8	95.3	93.3	2.04
القبة كوكا كولا	0.221	0.111	-0.220	-0.107	1.2	4.0	95.3	94.2	1.09
Line262	0.206	0.110	-0.206	-0.110	0.0	0.0	95.7	95.7	0.01
Line263	1.959	0.596	-1.958	-0.595	1.0	1.3	95.7	95.7	0.06
بكري وابوترك	0.069	0.028	-0.068	-0.027	0.5	0.8	95.7	94.7	1.02
حسن حلو	0.033	0.039	-0.033	-0.039	0.1	0.2	95.7	95.3	0.43
نصر حلو	0.105	0.042	-0.104	-0.041	1.0	1.5	95.7	94.5	1.24
Line268	1.688	0.758	-1.686	-0.755	2.1	2.6	95.7	95.5	0.15
المسلخ	0.270	0.112	-0.268	-0.106	1.6	5.6	95.7	94.5	1.17
133	1.611	0.736	-1.611	-0.735	0.8	0.9	95.5	95.4	0.06
Line264	0.074	0.020	-0.074	-0.020	0.0	0.0	95.5	95.5	0.00
شمس الزعري	0.038	0.008	-0.038	-0.008	0.1	0.1	95.5	95.3	0.18
نور الدين الزعري	0.036	0.012	-0.036	-0.012	0.1	0.2	95.5	95.0	0.50
Line269	1.402	0.602	-1.401	-0.601	0.6	0.7	95.4	95.4	0.05
مجمع الحرف1	0.209	0.133	-0.208	-0.129	1.2	4.0	95.4	94.2	1.21
Line270	1.191	0.469	-1.191	-0.469	0.2	0.3	95.4	95.4	0.02
مجمع الحرف2	0.210	0.132	-0.207	-0.129	2.4	3.6	95.4	93.9	1.50
Cable512	0.008	0.004	-0.008	-0.004	0.0	0.0	95.4	95.4	0.00
Line271	1.174	0.461	-1.173	-0.460	0.6	0.7	95.4	95.3	0.06
حسن نبروخ	0.009	0.004	-0.009	-0.004	0.0	0.0	95.4	95.2	0.13
الريو	0.008	0.004	-0.008	-0.004	0.0	0.0	95.4	95.3	0.08
Cable514	0.192	0.065	-0.192	-0.065	0.0	0.0	95.3	95.3	0.01
Line273	0.981	0.395	-0.981	-0.395	0.2	0.2	95.3	95.3	0.02
تامر الاطرش	0.192	0.065	-0.191	-0.063	1.6	2.4	95.3	94.2	1.07
Cable516	0.269	0.109	-0.269	-0.109	0.0	0.0	95.3	95.3	0.00
Cable519	0.199	0.003	-0.199	-0.003	0.0	0.0	95.3	95.3	0.01
Line265	0.437	0.249	-0.436	-0.249	0.1	0.1	95.3	95.3	0.04

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Line266	0.045	0.022	-0.045	-0.022	0.0	-0.1	95.3	95.3	0.00
وليد ابوتركي	0.031	0.013	-0.031	-0.012	0.2	0.3	95.3	94.6	0.73
Cable517	0.134	0.054	-0.134	-0.054	0.0	0.0	95.3	95.3	0.00
عثمان محمد وشركاه	0.135	0.054	-0.135	-0.053	0.3	1.1	95.3	94.8	0.47
محمد شريف	0.134	0.054	-0.132	-0.052	1.3	1.9	95.3	94.0	1.25
جهاد عزو جابر	0.199	0.003	-0.198	0.000	0.7	2.6	95.3	94.9	0.37
Line275	0.308	0.190	-0.308	-0.190	0.0	0.0	95.3	95.2	0.01
Line277	0.128	0.059	-0.128	-0.059	0.0	-0.1	95.3	95.2	0.01
خضري وقصراوي	0.009	0.011	-0.009	-0.011	0.0	0.0	95.2	94.9	0.38
نخلة الكركي	0.252	0.160	-0.248	-0.154	4.4	6.6	95.2	93.0	2.29
زهرايو حنديه	0.046	0.019	-0.046	-0.018	0.4	0.6	95.2	94.2	1.08
Cable521	0.033	0.021	-0.033	-0.021	0.0	0.0	95.2	95.2	0.00
طالب علي	0.095	0.038	-0.094	-0.037	0.6	1.0	95.2	94.4	0.89
مجمع الأميرة	0.033	0.021	-0.033	-0.021	0.2	0.2	95.2	94.6	0.60
Line279	1.379	0.533	-1.379	-0.532	0.2	0.3	96.4	96.4	0.02
Line280	0.172	0.067	-0.172	-0.067	0.0	0.0	96.4	96.4	0.01
Line283	1.207	0.465	-1.207	-0.465	0.2	0.2	96.4	96.3	0.02
Line281	0.115	0.046	-0.115	-0.046	0.0	0.0	96.4	96.4	0.00
جهاد السلامه	0.057	0.021	-0.057	-0.021	0.2	0.3	96.4	95.9	0.51
نعمان شبانه	0.115	0.046	-0.115	-0.045	0.3	1.0	96.4	95.9	0.49
Line284	0.497	0.204	-0.497	-0.203	0.4	0.1	96.3	96.3	0.07
Line285	0.652	0.239	-0.652	-0.239	0.0	0.0	96.3	96.3	0.01
الشرياتي جرسليم	0.057	0.023	-0.057	-0.023	0.1	0.2	96.3	96.2	0.20
الشرياتي الحديثه	0.314	0.130	-0.313	-0.124	1.7	6.0	96.3	95.2	1.09
رضوان المحاسب	0.183	0.074	-0.181	-0.072	1.5	2.2	96.3	95.2	1.07
Cable528	0.203	0.081	-0.203	-0.082	0.0	-1.3	96.3	96.3	0.01
Line287	0.449	0.157	-0.449	-0.157	0.0	0.0	96.3	96.3	0.01
غز البصل	0.203	0.082	-0.202	-0.080	0.7	2.5	96.3	95.6	0.70
Cable530	0.112	0.043	-0.112	-0.043	0.0	0.0	96.3	96.3	0.00
Cable531	0.009	0.004	-0.009	-0.004	0.0	0.0	96.3	96.3	0.00
Line289	0.327	0.111	-0.327	-0.111	0.0	0.0	96.3	96.3	0.01
ناجي الجعري	0.009	0.004	-0.009	-0.004	0.0	0.0	96.3	96.3	0.07
Line290	0.039	0.014	-0.039	-0.014	0.0	0.0	96.3	96.3	0.00
سنقرط للبلاستيك	0.041	0.013	-0.041	-0.013	0.1	0.2	96.3	96.0	0.35
سنقرط للبلاط	0.033	0.015	-0.033	-0.015	0.2	0.3	96.3	95.5	0.80
عبد المهدي سعيد	0.039	0.014	-0.039	-0.014	0.2	0.2	96.3	95.8	0.55
Line292	0.220	0.068	-0.220	-0.068	0.0	0.0	96.3	96.3	0.01

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
محمد جميل العزة	0.107	0.043	-0.106	-0.042	0.8	1.2	96.3	95.3	0.99
Cable536	0.128	0.052	-0.128	-0.052	0.0	0.0	96.3	96.3	0.00
Line294	0.092	0.016	-0.092	-0.016	0.0	0.0	96.3	96.3	0.00
منصور	0.128	0.052	-0.127	-0.050	1.1	1.7	96.3	95.1	1.18
Line295	0.092	0.016	-0.092	-0.016	0.0	0.0	96.3	96.3	0.00
Line296	0.000	0.000	0.000	0.000	0.0	0.0	96.3	96.3	0.00
جبريل ابو داود	0.092	0.016	-0.091	-0.015	0.4	0.6	96.3	95.8	0.53
Line298	1.652	0.640	-1.651	-0.639	0.7	0.8	96.4	96.3	0.05
Line299	0.172	0.055	-0.172	-0.055	0.0	0.0	96.3	96.3	0.00
Line302	1.479	0.584	-1.479	-0.583	0.4	0.5	96.3	96.3	0.04
Line300	0.019	0.007	-0.019	-0.007	0.0	0.0	96.3	96.3	0.00
ماهر أبو غربية	0.153	0.048	-0.151	-0.044	2.5	3.7	96.3	94.3	2.06
منير ابو حنيد	0.019	0.007	-0.019	-0.007	0.0	0.0	96.3	96.2	0.14
Line304	1.268	0.497	-1.268	-0.496	0.2	0.2	96.3	96.3	0.02
محطة الاندلس	0.211	0.087	-0.208	-0.082	3.1	4.7	96.3	94.3	1.96
Line305	1.149	0.449	-1.149	-0.448	0.2	0.2	96.3	96.3	0.02
Line306	0.019	0.007	-0.019	-0.007	0.0	-0.1	96.3	96.3	0.00
المناصره	0.100	0.040	-0.100	-0.039	0.7	1.1	96.3	95.4	0.93
محمد خليل ابوتركه	0.019	0.007	-0.018	-0.007	0.0	0.0	96.3	96.2	0.11
Line308	0.100	0.041	-0.100	-0.041	0.0	-0.1	96.3	96.3	0.00
Line309	1.049	0.408	-1.049	-0.408	0.2	0.3	96.3	96.2	0.03
عزام ابوحنينه	0.100	0.041	-0.099	-0.039	1.1	1.7	96.3	94.8	1.48
Cable539	0.226	0.078	-0.226	-0.078	0.0	0.0	96.2	96.2	0.00
Line311	0.822	0.330	-0.822	-0.329	0.1	0.1	96.2	96.2	0.01
Cable541	0.217	0.075	-0.217	-0.075	0.0	0.0	96.2	96.2	0.00
الاسفلت	0.009	0.003	-0.009	-0.003	0.0	0.0	96.2	96.2	0.04
الفارس	0.217	0.075	-0.214	-0.070	3.2	4.7	96.2	94.3	1.89
Line313	0.320	0.129	-0.320	-0.129	0.1	0.0	96.2	96.2	0.02
Line315	0.493	0.197	-0.493	-0.197	0.1	0.0	96.2	96.2	0.01
اسعد الجعيري	0.009	0.004	-0.009	-0.004	0.0	0.0	96.2	96.0	0.21
Line314	0.237	0.096	-0.237	-0.096	0.0	0.0	96.2	96.2	0.02
زهير الحسيني	0.083	0.033	-0.082	-0.033	0.3	0.5	96.2	95.7	0.48
إطلال الحسين	0.100	0.041	-0.098	-0.039	1.1	1.7	96.2	94.7	1.47
كفل الرحسيني	0.137	0.055	-0.137	-0.054	0.4	1.4	96.2	95.6	0.59
Cable542	0.136	0.055	-0.136	-0.055	0.0	-0.7	96.2	96.2	0.00
Line317	0.239	0.094	-0.239	-0.094	0.0	-0.1	96.2	96.2	0.02
طالب ابو سنينه	0.090	0.037	-0.089	-0.035	1.4	2.1	96.2	94.1	2.10

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
فريد ابو حديد	0.027	0.011	-0.027	-0.011	0.2	0.3	96.2	95.2	1.01
عبد المعز نيروخ	0.136	0.055	-0.135	-0.053	1.3	1.9	96.2	94.9	1.26
Line319	0.166	0.066	-0.166	-0.066	0.0	0.0	96.2	96.2	0.00
Line323	0.074	0.028	-0.074	-0.028	0.0	-0.1	96.2	96.2	0.00
Line320	0.120	0.048	-0.120	-0.048	0.0	0.0	96.2	96.2	0.00
نعيم الننتشه	0.046	0.018	-0.046	-0.018	0.1	0.1	96.2	95.9	0.27
Line321	0.081	0.032	-0.081	-0.032	0.0	0.0	96.2	96.2	0.00
عمر ابوشوخ	0.039	0.015	-0.039	-0.015	0.1	0.1	96.2	96.0	0.23
الاشانات	0.081	0.032	-0.081	-0.032	0.3	0.4	96.2	95.7	0.47
Cable544	0.037	0.013	-0.037	-0.015	0.0	-1.4	96.2	96.2	0.00
محمد عيسى عمرو	0.037	0.015	-0.037	-0.014	0.2	0.2	96.2	95.6	0.54
الهيوموني	0.037	0.015	-0.037	-0.015	0.1	0.1	96.2	95.8	0.34
Line325	0.685	0.313	-0.685	-0.313	0.2	0.1	96.2	96.2	0.03
ماجد ابوميله	0.055	0.022	-0.054	-0.021	0.5	0.8	96.2	94.9	1.26
Line327	0.594	0.276	-0.593	-0.276	0.1	0.1	96.2	96.1	0.03
مفرق الضاحية	0.091	0.037	-0.090	-0.036	0.9	1.4	96.2	94.8	1.35
Cable550	0.091	0.040	-0.091	-0.040	0.0	0.0	96.1	96.1	0.02
Line329	0.411	0.199	-0.411	-0.199	0.3	0.1	96.1	96.1	0.07
محول بنر عيس	0.091	0.037	-0.091	-0.036	0.7	1.1	96.1	95.1	1.07
خلة مناع	0.091	0.040	-0.090	-0.038	0.9	1.4	96.1	94.7	1.39
Line331	0.360	0.174	-0.360	-0.174	0.1	0.0	96.1	96.0	0.04
ماجد أبو اسنينة	0.050	0.025	-0.050	-0.024	0.8	1.1	96.1	94.0	2.02
Line333	0.191	0.105	-0.190	-0.105	0.2	-0.4	96.0	95.9	0.12
عبدالمعطي ابوتركي	0.018	0.007	-0.018	-0.007	0.1	0.1	96.0	95.6	0.42
وادالسمن	0.151	0.062	-0.150	-0.059	1.6	2.4	96.0	94.6	1.40
Line335	0.064	0.025	-0.064	-0.025	0.0	-0.2	95.9	95.9	0.01
عقبة انجيله	0.127	0.080	-0.124	-0.077	2.2	3.3	95.9	93.6	2.28
Line337	0.018	0.006	-0.018	-0.006	0.0	-0.4	95.9	95.9	0.01
مسجد حسن البنا	0.046	0.020	-0.045	-0.019	0.2	0.4	95.9	95.2	0.69
بويرت زيف	0.018	0.006	-0.018	-0.006	0.0	0.1	95.9	95.6	0.25
شبكة المجد	3.209	1.267	-3.178	-1.226	31.4	40.6	96.2	95.0	1.23
كيبيل طارق - محمدعلي	3.178	1.226	-3.170	-1.220	8.1	6.4	95.0	94.7	0.27
Cable552	0.349	0.121	-0.349	-0.121	0.1	0.1	94.7	94.7	0.02
Cable554	2.386	0.900	-2.384	-0.899	2.3	1.8	94.7	94.6	0.10
مدرسة أحمد	0.434	0.198	-0.429	-0.183	4.4	15.2	94.7	92.7	2.01
مدرسة القدس	0.349	0.121	-0.344	-0.113	5.4	8.1	94.7	92.7	1.96
Cable555	0.525	0.233	-0.525	-0.233	0.1	0.1	94.6	94.6	0.02

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Cable558	1.859	0.665	-1.856	-0.663	2.5	2.0	94.6	94.5	0.15
Cable556	0.175	0.077	-0.175	-0.077	0.0	0.0	94.6	94.6	0.02
مسجدالمحسنين	0.351	0.156	-0.349	-0.148	2.3	7.9	94.6	93.3	1.29
خلة القيه	0.175	0.077	-0.172	-0.073	2.3	3.4	94.6	92.9	1.69
Cable560	1.419	0.525	-1.418	-0.525	1.0	0.8	94.5	94.4	0.07
جبل الضاحية1	0.437	0.138	-0.434	-0.127	3.2	11.3	94.5	93.2	1.32
Cable561	0.984	0.329	-0.984	-0.329	0.5	0.4	94.4	94.4	0.05
جبل الضاحية	0.434	0.195	-0.430	-0.183	3.5	12.2	94.4	92.8	1.61
Line341	0.547	0.191	-0.547	-0.191	0.4	0.2	94.4	94.3	0.07
الكسا	0.436	0.138	-0.433	-0.126	3.2	11.3	94.4	93.0	1.31
Line343	0.216	0.075	-0.216	-0.075	0.1	-0.1	94.3	94.2	0.04
جبل جالس	0.331	0.116	-0.328	-0.108	2.4	8.3	94.3	93.0	1.32
خلة النتش	0.216	0.075	-0.213	-0.070	3.3	4.9	94.2	92.3	1.92
Line345	3.205	1.335	-3.203	-1.332	1.9	2.5	96.2	96.2	0.08
Line347	3.174	1.320	-3.170	-1.316	3.5	4.6	96.2	96.0	0.14
شركة البنقيه	0.029	0.012	-0.029	-0.012	0.1	0.1	96.2	95.7	0.43
Line349	3.076	1.278	-3.075	-1.277	1.1	1.4	96.0	96.0	0.05
احمد الحر بلاوي	0.094	0.037	-0.093	-0.037	0.4	0.6	96.0	95.5	0.55
Line350	0.578	0.234	-0.578	-0.234	0.1	0.0	96.0	96.0	0.01
Line360	2.497	1.043	-2.496	-1.042	0.7	0.9	96.0	95.9	0.04
Line351	0.084	0.034	-0.084	-0.034	0.0	-0.1	96.0	96.0	0.01
Line355	0.494	0.200	-0.494	-0.200	0.1	0.0	96.0	96.0	0.02
انريس	0.084	0.034	-0.083	-0.033	0.5	0.7	96.0	95.2	0.78
Line352	0.099	0.040	-0.099	-0.040	0.0	0.0	96.0	95.9	0.00
Line354	0.081	0.032	-0.081	-0.032	0.0	0.0	96.0	95.9	0.00
Line357	0.315	0.128	-0.315	-0.128	0.1	0.0	96.0	95.9	0.03
هائي غيث	0.099	0.040	-0.098	-0.039	0.7	1.0	95.9	95.0	0.91
اسحق الشرباتي	0.016	0.007	-0.016	-0.006	0.0	0.1	95.9	95.6	0.38
السلامه	0.064	0.026	-0.064	-0.025	0.2	0.3	95.9	95.5	0.47
Line358	0.149	0.061	-0.149	-0.061	0.0	0.0	95.9	95.9	0.01
فيصل ابوسنينه	0.165	0.067	-0.163	-0.065	1.9	2.9	95.9	94.4	1.53
Line353	0.059	0.024	-0.059	-0.024	0.0	0.0	95.9	95.9	0.00
الارتباط القواسمه	0.091	0.037	-0.090	-0.036	0.9	1.4	95.9	94.6	1.35
الامير	0.059	0.024	-0.058	-0.023	0.6	0.9	95.9	94.5	1.36
Line362	0.235	0.096	-0.235	-0.096	0.0	0.0	95.9	95.9	0.01
Line366	2.205	0.924	-2.204	-0.923	0.9	1.1	95.9	95.9	0.05
الشركه الواعده	0.057	0.023	-0.056	-0.022	0.2	0.3	95.9	95.4	0.52

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Line364	0.189	0.077	-0.189	-0.077	0.0	0.0	95.9	95.9	0.02
راشد الزعري	0.046	0.018	-0.046	-0.018	0.1	0.2	95.9	95.5	0.42
عطا ابو رموز	0.189	0.077	-0.186	-0.074	2.5	3.8	95.9	94.2	1.76
Line367	2.074	0.871	-2.072	-0.868	2.2	2.8	95.9	95.8	0.14
اكرم ابوسنينه	0.038	0.015	-0.038	-0.015	0.1	0.2	95.9	95.5	0.35
شعيب منقرط	0.091	0.037	-0.091	-0.036	0.6	0.9	95.9	95.1	0.85
Line368	2.014	0.845	-2.013	-0.843	1.0	1.2	95.8	95.7	0.06
1 عبد الاطرش	0.058	0.023	-0.058	-0.023	0.4	0.6	95.8	94.9	0.86
Line369	0.888	0.377	-0.888	-0.377	0.4	0.4	95.7	95.6	0.05
Line375	0.833	0.345	-0.832	-0.345	0.3	0.3	95.7	95.7	0.05
ابوداود	0.111	0.046	-0.109	-0.043	2.2	3.3	95.7	93.1	2.60
ابوزينه	0.182	0.074	-0.179	-0.071	2.3	3.5	95.7	94.0	1.69
Cable569	0.788	0.337	-0.788	-0.337	0.1	0.1	95.6	95.6	0.01
منشار الزعري	0.100	0.040	-0.099	-0.039	0.4	0.7	95.6	95.1	0.59
Cable571	0.568	0.232	-0.568	-0.232	0.1	0.0	95.6	95.6	0.01
Line401	0.186	0.091	-0.186	-0.091	0.0	-0.1	95.6	95.6	0.02
ناصر قباجة	0.034	0.013	-0.033	-0.013	0.1	0.2	95.6	95.1	0.50
Line371	0.418	0.171	-0.418	-0.171	0.1	0.0	95.6	95.6	0.03
الشمياء	0.150	0.061	-0.149	-0.059	1.6	2.4	95.6	94.2	1.40
Line373	0.325	0.134	-0.325	-0.134	0.1	0.0	95.6	95.6	0.02
فايز غيث	0.038	0.015	-0.038	-0.015	0.2	0.2	95.6	95.0	0.57
محمدي غيث	0.055	0.022	-0.054	-0.021	0.5	0.8	95.6	94.3	1.27
Cable572	0.018	0.007	-0.018	-0.007	0.0	-0.7	95.6	95.6	0.00
Cable574	0.307	0.127	-0.307	-0.128	0.0	-0.7	95.6	95.6	0.01
عبد العظيم ابورجب	0.018	0.007	-0.018	-0.007	0.0	0.0	95.6	95.4	0.17
ياسين قباجة	0.307	0.128	-0.305	-0.120	2.1	7.3	95.6	94.2	1.34
Cable577	0.832	0.345	-0.832	-0.345	0.1	0.1	95.7	95.6	0.01
Cable578	0.515	0.212	-0.515	-0.212	0.0	0.0	95.6	95.6	0.01
الباكر الكبيجي	0.317	0.133	-0.310	-0.122	7.2	10.8	95.6	92.7	2.98
Line377	0.515	0.212	-0.515	-0.212	0.1	0.0	95.6	95.6	0.02
Line379	0.330	0.134	-0.330	-0.134	0.0	0.0	95.6	95.6	0.01
غالب ابوقويد	0.185	0.077	-0.181	-0.072	3.9	5.9	95.6	92.8	2.78
Line381	0.264	0.108	-0.264	-0.108	0.0	0.0	95.6	95.6	0.01
خميس نبروخ	0.066	0.026	-0.066	-0.026	0.3	0.5	95.6	95.0	0.61
مروان الننتشة	0.264	0.108	-0.261	-0.103	3.1	4.7	95.6	94.0	1.56
Line384	0.523	0.215	-0.523	-0.215	0.1	0.0	95.9	95.9	0.02
Line388	2.723	1.097	-2.721	-1.095	2.2	1.9	95.9	95.8	0.09

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Line420	-3.246	-1.037	3.256	1.045	9.3	8.3	95.9	96.2	0.32
Line386	0.217	0.088	-0.217	-0.088	0.0	0.0	95.9	95.9	0.02
الجمال الاطرش	0.306	0.127	-0.304	-0.120	2.1	7.2	95.9	94.5	1.33
شركة التقدم	0.217	0.088	-0.215	-0.085	2.1	3.1	95.9	94.6	1.28
Cable586	0.018	0.008	-0.018	-0.009	0.0	-0.9	95.8	95.8	0.00
Line390	2.703	1.087	-2.698	-1.083	4.9	4.3	95.8	95.6	0.20
Cable594	0.091	0.036	-0.091	-0.036	0.0	-0.5	95.6	95.6	0.00
Line392	0.212	0.087	-0.212	-0.087	0.0	0.0	95.6	95.6	0.00
Line394	2.386	0.956	-2.383	-0.953	3.7	3.3	95.6	95.4	0.17
3ناحي جابر	0.009	0.004	-0.009	-0.004	0.0	0.0	95.6	95.4	0.21
Cable588	0.212	0.087	-0.212	-0.088	0.0	-0.4	95.6	95.6	0.00
Cable590	0.032	0.015	-0.032	-0.015	0.0	-0.3	95.6	95.6	0.00
Cable592	0.084	0.034	-0.084	-0.034	0.0	-0.5	95.6	95.6	0.00
شركة البناء والتطوير	0.096	0.038	-0.096	-0.038	0.4	0.6	95.6	95.0	0.57
عبدالحافظ ادريس	0.032	0.015	-0.032	-0.015	0.1	0.1	95.6	95.3	0.32
طالب ناخي جابر	0.091	0.036	-0.090	-0.036	0.5	0.7	95.6	94.9	0.68
Line396	2.364	0.946	-2.362	-0.944	2.2	1.9	95.4	95.3	0.10
عربي الرجبي	0.018	0.007	-0.018	-0.007	0.0	0.0	95.4	95.3	0.17
Line398	2.138	0.853	-2.137	-0.852	0.9	0.8	95.3	95.3	0.04
عبد الشكور الاطرش	0.126	0.051	-0.124	-0.049	1.1	1.7	95.3	94.1	1.17
محمد المناصره	0.098	0.040	-0.098	-0.039	0.7	1.0	95.3	94.4	0.92
Line399	1.978	0.787	-1.976	-0.786	1.5	1.3	95.3	95.2	0.09
ياسين غيث	0.160	0.066	-0.157	-0.062	2.3	3.5	95.3	93.4	1.90
Cable607	0.000	-0.213	0.000	0.000	0.0	-212.9	100.0	100.0	0.00
Line402	0.177	0.088	-0.177	-0.088	0.1	-0.1	95.6	95.6	0.03
الديك	0.009	0.004	-0.009	-0.004	0.0	0.0	95.6	95.5	0.14
خلة ابو عصا	0.177	0.088	-0.174	-0.084	2.4	3.5	95.6	93.8	1.78
حسن الصاحب	0.018	0.007	-0.018	-0.007	0.0	0.1	95.6	95.3	0.27
موسى دعا	0.059	0.024	-0.058	-0.023	0.4	0.6	95.6	94.7	0.87
حسين الجعيري	0.045	0.022	-0.045	-0.022	0.1	0.2	95.3	94.9	0.36
Line404	1.533	0.602	-1.533	-0.602	0.4	0.4	95.2	95.2	0.03
Line405	0.154	0.063	-0.154	-0.063	0.0	0.0	95.2	95.2	0.00
الاخنف	0.288	0.121	-0.282	-0.112	6.0	9.0	95.2	92.5	2.72
عبيد غيث	0.051	0.021	-0.051	-0.020	0.3	0.4	95.2	94.4	0.77
ويلدكات	0.103	0.042	-0.102	-0.040	1.2	1.8	95.2	93.6	1.54
Line406	0.059	0.024	-0.059	-0.024	0.0	0.0	95.2	95.2	0.00
Line408	1.446	0.567	-1.446	-0.567	0.4	0.3	95.2	95.1	0.03

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CKT / Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
فارس غيث	0.027	0.011	-0.027	-0.011	0.1	0.2	95.2	94.5	0.63
اسماعيل ابوحمديه	0.059	0.024	-0.059	-0.023	0.2	0.2	95.2	94.8	0.35
Line409	0.056	0.022	-0.056	-0.022	0.0	0.0	95.1	95.1	0.00
Line410	0.390	0.160	-0.390	-0.160	0.0	0.0	95.1	95.1	0.01
Line411	0.819	0.324	-0.819	-0.324	0.1	0.1	95.1	95.1	0.02
سليمان جابر	0.181	0.061	-0.179	-0.059	1.4	2.1	95.1	94.1	1.00
هشلمون ورجي	0.056	0.022	-0.055	-0.022	0.2	0.3	95.1	94.6	0.52
Line412	0.199	0.082	-0.199	-0.082	0.0	0.0	95.1	95.1	0.00
سالم وعمر جابر	0.165	0.067	-0.163	-0.064	1.9	2.9	95.1	93.6	1.54
عبد الكريم داوود	0.027	0.011	-0.027	-0.011	0.1	0.2	95.1	94.5	0.63
Line413	0.224	0.087	-0.224	-0.087	0.0	0.0	95.1	95.1	0.00
Line414	0.506	0.201	-0.506	-0.201	0.0	0.0	95.1	95.1	0.01
جوال	0.090	0.036	-0.089	-0.035	0.6	0.9	95.1	94.3	0.84
خلف جابر	0.199	0.082	-0.196	-0.077	2.8	4.2	95.1	93.3	1.86
عبد العزيز ابوسمره	0.145	0.055	-0.143	-0.052	2.4	3.6	95.1	93.0	2.12
فلاح ابوحماد	0.018	0.007	-0.018	-0.007	0.1	0.1	95.1	94.7	0.42
وائل البكري	0.060	0.024	-0.060	-0.024	0.3	0.4	95.1	94.5	0.56
Cable609	0.060	0.015	-0.060	-0.018	0.0	-2.4	95.1	95.1	0.00
Line415	0.446	0.186	-0.446	-0.186	0.0	0.0	95.1	95.1	0.01
Line418	0.000	0.000	0.000	0.000	0.0	0.0	95.1	95.1	0.00
Line416	0.234	0.099	-0.234	-0.099	0.0	0.0	95.1	95.1	0.02
حميدان جابر	0.211	0.087	-0.208	-0.082	3.2	4.8	95.1	93.1	1.98
حميدان جابر2	0.090	0.036	-0.089	-0.035	0.6	0.9	95.1	94.2	0.84
شفيق غيث	0.145	0.063	-0.144	-0.061	1.0	1.5	95.1	94.2	0.88
بدر ابوحماد	0.070	0.029	-0.069	-0.027	1.4	2.1	95.4	92.7	2.64
رسمي فارس غيث	0.060	0.018	-0.060	-0.017	0.2	0.4	95.1	94.6	0.51
شركة الغفران	0.070	0.026	-0.070	-0.026	0.1	0.3	95.2	95.0	0.23
سليمان القواسمه الجعبه	-0.018	-0.009	0.018	0.009	0.1	0.1	95.3	95.8	0.46
شعيب ادريس	0.084	0.034	-0.082	-0.033	1.2	1.9	95.6	93.6	1.95
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