

# Curriculum Vitae

**Name:** Iqbal Ahmed AL-Tayar



- **Expert and Judicial Arbitration committee member in the Ministry of Justice.**

## **Educational Qualification:**

- **BA of Engineering – Mechanical Engineering – Kuwait University**
- **Expert and member in the Arbitration Lawyers Center.**
- **Member of the American World Organization in the Kuwait Center of Commercial Arbitration.**
- **Member of the American World Organization for Value Engineering and have the AVS certificate from The American SAVE International Association.**
- **Member of the American Association of Energy Engineers**

## **Work Experience**

- **The first site engineer in the ministry in the Water Sector Projects (Al-Zour Water Station) (Replacement of the water networks of Al-Nozha and Al-Faeha Area)**
- **Member of the American Society of Heating, Refrigerating and Air-condition Engineers (ASHRAE).**
- **Manager of the Technical Controlling Management since 1992.**
- **Al-Tarshed Team Manager for the following sectors: Government sector, Hotel sector, Banking sector and Oil Sector.**
- **National Committee member for Green Building.**
- **A professor of the Public Authority of Applied Education and Training since 2000.**
- **A professor of the Rehabilitation Program of the new ministry engineers**
- **Member of Kuwait Society of Engineers, membership No. 1715.**



# **MEW EFFORTS IN REDUCING ELECTRICITY AND WATER CONSUMPTION IN GOVERNMENT AND PRIVATE SECTORS IN KUWAIT**

**Eng. Iqbal Al-Tayar**

**Manager – Technical Supervision  
Department**

**Planning and Training Sector  
Ministry of Electricity & Water (MEW) -  
Kuwait**



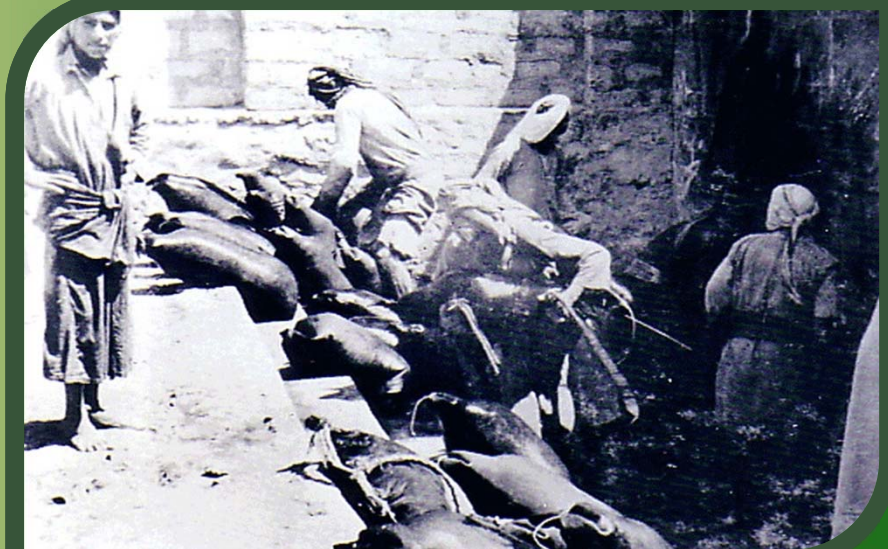
# Historical Background - Electricity

- In 1913, the first electric machine was installed in Kuwait to operate 400 lamps for Al-Saif Palace.
- In 1934, two electric generators were installed with a total capacity of 60 kW.
- In 1949, the first power generation plant was established in Merghab with a total capacity of 60 kW.
- In 1951, Kuwait established the General Department of Electricity and then the Ministry of Electricity & Water in 1961.



# Historical Background - Water

- < 1925 - rain water and shallow wells
- 1925 - 1951 - water imported from Shatt Al-Arab, Iraq
- 1951 - public water supply service established and managed by the State
- 1951 - KOC installs a small desalination plant
- 1960 - discovery of fresh water at Al-Raudhatain
- 1970 - to date - rapid increase of desalination capacity





# Electricity Generation and Water Desalination

No.	Power Station	Established	Electricity Generation	Water Production
		Year	Million kW	Million emperor/day
1	Shuwaikh Plant	1955	33	4
2	Shuaiba North Plant	1965	72	9
3	Shuaiba South Plant	1970	3.032	30
4	Al-Doha East Plant	1977	4.630	42
5	Al-Doha west Plant	1984	11.010	110
6	Az-Zour South Plant	1989	101.212	36
7	Sabiya Plant	1998	29	100

# MEW Responsibilities

- Fully responsible to provide electricity and water for all consumers in the State of Kuwait, which cover the following areas:
  - Generation
  - Transmission and Distribution
  - Collection of Water and Electricity Invoices.



# MEW Efforts

- MEW efforts to monitor and enforce conservation policies on government and private sectors
- Awareness Campaign
  - 2007 National Conservation Campaign (Tarsheed) in collaboration with Kuwait Society of Engineers.
- MEW collaboration with Kuwait Institute for Scientific Research (KISR)
- MEW collaboration with Kuwait University (KU)
- Efforts of other government and institutional agencies to reduce power demand and energy consumption





# Objectives of Conservation Policies on government and private sectors

To reduce power demand and energy during peak summer months and yearly energy consumption:

- Optimized operation strategies of Air-conditioning and lighting systems.
- Utilization of more energy efficient systems.

To minimize water consumption.

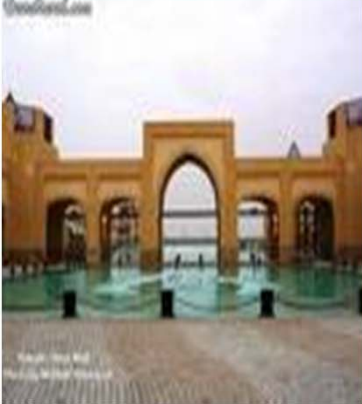




# Government Buildings

No.	Name of the Institution	Energy Savings
		%
1	Assessment Authority for Compensation	11
2	Kuwait Public Transport Co.	14
3	Ministry of Foreign Affairs	12
4	Ministry of Public Works	18
5	Development and Planning, Secretariat Building	11
6	Public Authority for Agriculture and Fisheries	15
7	Kuwait News Agencies	8

# Shopping Malls



No.	Name of Shopping Mall	Energy Savings
		%
1	Lila Gallary	6
2	Al-Mohallab	4
3	Marina	8
4	Avenues Mall	9
5	Ajial	9
6	Al-Kutte	3
7	Al-Manshar	5
8	Beirut	4
9	Al-Fannar	7
10	Maghateer	10





# Hotels and Banks

No.	Name of Hotel	Energy Savings
		%
1	Sheraton	2
2	JW Marriott	2
3	Movenpick El-Beda'a	4
4	Marina	3
5	SAS International	5

No.	Name of Bank	Energy Savings
		%
1	Kuwait Finance House	17
2	National Bank of Kuwait	14
3	Commerical Bank	21
4	International Bank	20

# Electricity Reading Collection

**ACK**

الهيئة العامة للكهرباء  
Kuwait Electricity Authority

Date: 08/08/2011

Attn: Eng. Ma  
Ministry  
Kuwait.

Subject: Electric

Dear Eng. Maha,  
In reference to

Time	Meter Series Number
12 p.m.	8110111
12 p.m.	8110127
12 p.m.	8229326
12 p.m.	8278374
5 p.m.	8110111
5 p.m.	8110127
5 p.m.	8229326
5 p.m.	8278374

Best Regards,

Support Services Department  
Facilities Unit

Date: 08/08/2011

Meter No.

Time

12:00 Noon

05:00 PM

12:00 Noon

Date: 08/08/2011

12:00 Noon

Month: 08/2011

Date/Time

TR-1 - PANEL 3C

TR-2 - PANEL 3A

TR-3 - PANEL 2A

TR-4 - PANEL 2B

TR-5 - PANEL 1B

TR-6 - PANEL 1A

TR-7 - PANEL 4B

TR-8 - PANEL 4A

TR-9 - PANEL 6

PANEL - AC 1

PANEL - AC 2

SPA METER - A

SPA METER - B

CPK Water Meter

SPA Water Meter

Attention : Mr. Engineers

3081116

843892

295912

MEW

Eng. Suad

Eng. Sheik

Eng. Reem

Tel: 2537

Fax: 2537

To: Mr. Hassan MEW

From: Mohammed Abd Chief Engineer Al Manshar Ro

Dear Mr. Hassan,

Please be informed that 5pm is as follows:

For your reference,

Best Regards,

Mohammed Abdallah Chief Engineer

**360° mall**

Monday

Sl. No.	TRANSFORMER #NO	Date: 17/07/2011(Sunday)	12:00pm	05:00pm	Date: 18/07/2011(Monday)	12:00pm	05:00pm	Date: 24/07/2011(Sunday)	12:00pm	05:00pm	Date: 25/07/2011(Monday)	12:00pm	05:00pm
1	01-TR-NO-01-8379756	3636190	3636670	780	3640620	3641400	780	3668440	3669510	1070	3673340	3674400	1060
2	01-TR-NO-02-8379721	4971800	4974630	2830	4978090	4980920	2830	5052970	5056470	3500	5070660	5074160	3500
3	01-TR-NO-03-8379781	8349240	8350990	1750	8359920	8361670	1750	8424160	8428440	2280	8435350	8437650	2300
4	01-TR-NO-04-8379850	9602640	9604110	1470	9613400	9614860	1460	9679800	9681840	2040	9692130	9694170	2040
5	01-TR-NO-05-8379755	4906550	4906740	190	4922330	4922730	200	4987540	4990970	3430	5001420	5004850	3430
6	01-TR-NO-06-8379736	7095760	7098610	2850	7111780	7114630	2850	7189650	7190570	920	7206840	7207780	940
7	01-TR-NO-07-8379806	11568480	11570690	2210	11583210	11585420	2210	11672310	11675390	3080	11688630	11691710	3080
8	01-TR-NO-08-8379754	7180450	7181270	820	7185700	7186520	820	7245920	7247030	1110	7251340	7252450	1110
9	01-TR-NO-09-8379706	4936980	4937260	280	4938790	4939090	300	4965650	4966040	390	4967570	4967960	390
10	01-TR-NO-10-8379748	6195290	6195830	540	6198610	6199150	540	6217970	6218690	720	6221400	6222140	740
11	01-TR-NO-11-8379735	5526620	5529120	2500	5540270	5542770	2500	5592700	5595960	3260	5599440	5602700	3260
12	01-CP-NO-23-8379881	5174270	5175150	880	5181150	5182050	880	5222190	5222690	740	5223620	5230370	750
13	01-TR-NO-12-8379671	1652080	1652270	190	1654020	1654210	190	1665500	1665810	310	1667470	1667780	310
14	01-TR-NO-13-8379780	2645320	2645970	650	2649760	2650380	620	2675560	2676560	1000	2680330	2681330	1000
15	01-TR-NO-14-8379761	3298660	3299600	940	3303820	3304760	940	3335880	3337210	1350	3341460	3342810	1350
16	01-TR-NO-15-8379770	2241820	2242470	650	2245700	2246340	640	2269900	2270250	950	2273550	2274500	950
17	01-TR-NO-16-8379734	5482170	5483380	1210	5489230	5490450	1220	5525490	5533150	7660	5538960	5546610	7650
18	01-TR-NO-17-8379815	5545870	5547270	1400	5553710	5555100	1390	5600580	5602710	2130	5609130	5611250	2120
19	01-TR-NO-18-8379799	5820960	5822800	1840	5830900	5832760	1860	5889290	5892070	2780	5900110	5902890	2780
20	01-TR-NO-19-8379765	4553800	4554970	1170	4560870	4562020	1150	4601790	4603450	1660	4609080	4610750	1670
21	01-TR-NO-20-8379784	3399050	3399850	800	3403550	3404390	840	3430410	3431630	1220	3435200	3436420	1220

Awareness campaign MEW  
conducted to reduce electricity and water in Kuwait.

## Kuwait National Bank

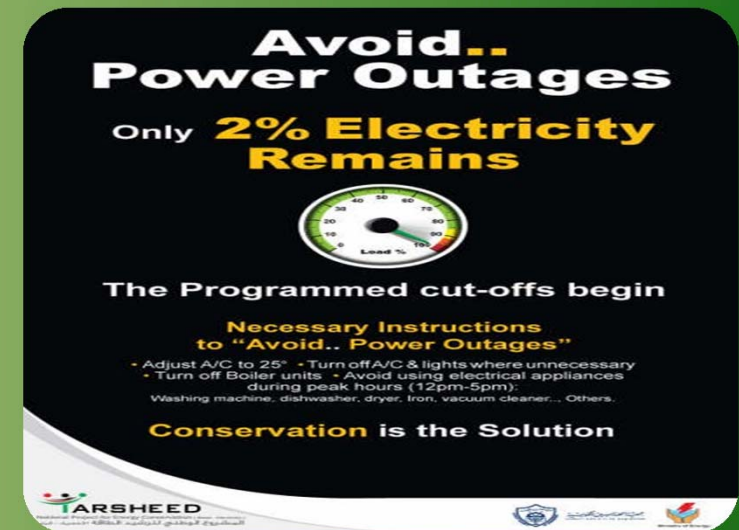
NBK recently launched its energy conservation awareness campaign tagged "Put your energy into saving energy". NBK volunteers handed out 10,000 long life energy-saving light bulbs at the Avenues Mall.





Awareness campaign MEW  
conducted to reduce electricity and water in Kuwait.

A campaign for Society  
of Engineers cost 10  
million K.D



Awareness campaign MEW  
conducted to reduce electricity and water in Kuwait.

Distribution of water conservation tools



Awareness campaign MEW  
conducted to reduce electricity and water in Kuwait.

energy-saving campaign cost 400,000 K.D  
Under the slogan

“we love it so we save for it”







# MEW and KISR Collaboration



1983 Regulations and Code of Practice  
Energy Audit Program



Peak power reduction program



Demand Side Management through Centralized Remote Control



Standard Specifications for Standard Rules and Extensions of Drinking Water in Kuwait



Distribution of Water Conservation Kits in the State of Kuwait



Design of a sustainable traditional Kuwaiti villa



# Standard Specifications for Standard Rules and Extensions of Drinking Water in Kuwait

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State of Kuwait  
Ministry of Electricity & Water



دولة الكويت  
وزارة الكهرباء والماء

## Major parameters analysis of Distilled, Brackish and Fresh water

Fax: 25386175

Parameters	Unit	D.W (Distilled water)	B.W (Brackish water)	F.W (Fresh water)
Temperature	(°C)	36 – 43	22 – 32	29 – 42
Conductivity	(µs/cm)	10 – 120	4000 – 7500	173 – 606
T.D.S.	(mg/l)	6.0 – 60	2500 – 4500	75 – 333
pH value		6 – 8.5	7.0 – 7.5	7.3 – 7.9
Residual Chlorine	Cl	Nil	Nil	0.35 – 0.90
Turbidity	(NTU)	0.1 – 1.0	0.1 – 0.2	0.16 – 1.0
Potassium	(K)	0 – 0.70	18 – 37.00	0.7 – 3.0
Calcium as	(Ca)	0 – 20	400 – 650	16.4 – 54.5
Magnesium	(Mg)	0.10 – 2.0	140 – 190	2.9 – 14.3
Chloride	(Cl)	5 – 60	650 – 2000	50 – 101
Sulphate	(SO <sub>4</sub> )	0.1 – 2.0	1000 – 1400	87.3 – 140
Nitrate	(NO <sub>3</sub> )	0.1 – 1.5	10 – 87	0.1 – 0.61
Alkalinity	(CaCO <sub>3</sub> )	1.0 – 65	90 – 140	37 – 68
Total Hardness	(CaCO <sub>3</sub> )	2 – 70	1500 – 2200	58 – 182
Carbon Di-oxide	(CO <sub>2</sub> )	1 – 3.0	10 – 15	0.92 – 2.56
Silica	(mg/l)	Nil	20 – 24	0.50 – 2.0

**Notes:** Quality subject to change during emergency operation conditions.

# 983 Regulations and Code of Practice

MEW/R-1: Regulations for Electrical Installations

MEW/R-2: Procedures for Approval of Electrical & A/C Drawings and connection of power supply for construction and buildings projects.

MEW/R-3: Electrical load form and explanatory memo

MEW/R-4: Regulations for testing of Electrical installations before connection of power supply

MEW/R-5: General Guidelines for Energy Conservation in buildings

MEW/R-6: Code of Practice for Energy Conservation in Kuwait building and Appendices

Appendix No. (1): Properties and application of insulating materials for buildings in Kuwait

Appendix No. (2): Energy Conservation Measures in Residential Sector Buildings.

Appendix No. (3): Energy Conservation Measures in Institutional and Commercial Sector Buildings

Appendix No. (4): Energy Conservation Measures Hospitals

Appendix No. (5): Effect of thermal mass and colour

Appendix No. (6): Comparison between air-cooled and water-cooled condensers.

MEW/R-7: Rules and Regulations for design of A/C System and Equipment

MEW/R-8: Rules and Regulations for handing over Engineering Services (Electrical and Mechanical) to the Maintenance Authority

MEW/R-9: General specification for electrical installation



## Benefit from The Code

Component	Unit	Quantity Saved	Unit Cost (mil KD/unit)	Total Savings (million KD)
Electrical Power Requirements	MW	2,530	0.48	1,214
A/C System	RT	1,260,000	500	630
Fuel	million Barrels	131	10	1,310
Total				3,154





# Achievements from Energy Audit Program

Building	Year	Peak Power Reduction (%)	Energy Saving (%)
<b>MEW and MPW buildings in South Surra</b>	<b>2004</b>	<b>38</b>	<b>20</b>
<b>Public Authority for Civil Information</b>	<b>2004</b>	<b>5</b>	<b>12</b>
<b>Al-Fanar Shopping Mall</b>	<b>2004</b>	<b>15</b>	<b>8</b>



# Peak Power Reduction through the Implementation of Smart Operations



# Projected Financial and Environmental Benefits

KD 500 million toward the cost of new power generation and distribution equipment.

KD 0.3 million KD per day of the MEW fuel bill during the summer season.

7,000 tons/day of CO<sub>2</sub> emissions during the summer season.



## Standard Specifications for Standard Rules and Extensions of Drinking Water in Kuwait

- Water treatment equipment
- Equipment of maintenance and water conservation
- types of some pipe material modules in Kuwait
  - Cross Linked Polyethylene (PEX )
  - Polypropylene (PP-R)





# Distribution of Water Conservation Kits in the State of Kuwait

## Selection of devices

- Health certificates
- Testing at KISR
- Price

## Distribution Plan

- **940 000** water saving devices was distributed in Residential Areas
- **160 000** was distributed for water users in Governmental buildings

## Savings

- reduce water use by 5%, or 26 million cubic meters per year (30% of houses x 85% domestic water use x 53% tap water use x 40% saving)



# Future Collaboration – Energy

No.	Project Title
1	Construction and Performance Evaluation of a sustainable traditional Kuwaiti villa (ongoing)
2	Updating of MEW Electrical Codes
3	Implementation of Energy Efficient Retrofits for Five Private Office Buildings
4	Development of a Guide and Building-Energy Simulator for MEW Code Compliance
5	Experimental Verification of Fenestration Products
6	Performance Assessment of Commercially Available Small and Medium Units Utilizing R410A Refrigerant
7	The Potential of Energy Conservation and Peak Power Reduction in Residential Sector (5 villas)





# Future Collaboration – Water

NO.	Project Title
1	Fifth International Symposium of groundwater between the Kuwait Institute for Scientific Research and the World Organization for Research and Engineering Environment Water (IAHR)
2	Household water consumption and conservation in Kuwait WM042K
3	Action plan "a pilot study to reduce water levels high and re-use in the areas of (Jaber al-Ahmad, and AL-Kairouan)
4	Action plan study (monitoring and evaluation of the quality of drinking water in the State of Kuwait)



## Energy-Efficient Design of Low-Rise Residential Buildings in Kuwait (ASHRAE 90.2 – Kuwait)

This standard provides minimum energy-efficiency requirements for the design and construction of

- a. New portions of residential dwelling units and their systems.
- b. New systems and equipment in existing dwelling units.





# Efforts of other Government and Institutional Agencies



# Conclusion

Work Hand in Hand  
For a Green  
Environment