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INCEPTION REPORT

SUPPORT IMPLEMENTATION OF BYLAW REGARDING COMPULSORY ENERGY AUDITS FOR LARGE ENERGY CONSUMERS IN JORDAN

AUGUST 2016

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SUPPORT IMPLEMENTATION OF BYLAW REGARDING COMPULSORY ENERGY AUDITS FOR LARGE ENERGY CONSUMERS IN JORDAN

INCEPTION REPORT

PROGRAM TITLE: SUPPORT MEMR IN IMPLEMENTATION OF
BYLAW (73) FOR COMPULSORY ENERGY AUDIT FOR
TARGETTED ENERGY CONSUMERS IN JORDAN

SPONSORING USAID OFFICE: ENERGY SECTOR CAPACITY
BUILDING PROGRAM

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This publication was prepared by IIEC Team – Sanjay Dube, Sommai Phon-Amnuaisuk and Dilip Limaye

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List of Acronyms

CEO	Chief Executive Officer
DOS	Department of Statistics
DSM	Demand Side Management
ECI	Energy Cost Index
ECM	Energy Conservation Measure
EDECO	Electricity Distribution Company
EE	Energy Efficiency
EMO	Energy Management Opportunity
EMRC	Energy and Mineral Regulatory Commission
Eng.	Engineer
ESCB	Energy Sector Capacity Building
ESCO	Energy Service Company
ESP	Energy Service Provider
EUI	Energy Use Intensity
EU	European Union
GDP	Gross Domestic Product
GWh	Giga Watt Hour
IDECO	Irbid District Electric Company
IIEC	International Institute for Energy Conservation
ISIC	International Standard Industrial Classification
IT	Information Technology
ISO	International Organization for Standardization
JCI	Jordan Chamber of Industries
JD	Jordanian Dinar
JEPCO	Jordan Electric Power Company
JNEEAP	National Energy Efficiency Action Plan
JPRC	Jordan Petroleum Refinery Company
JREEF	Jordan Renewable Energy and Energy Efficiency Fund
LPG	Liquid Petroleum Gas
Kgoe	Kilo Gram of Oil Equivalent
KW	Kilo Watt
kWh	Kilo Watt Hour
LOE	Level of Efforts

MEMR	Ministry of Energy and Mineral Resources
MOPWH	Ministry of Public Works and Housing
MOU	Memorandum of Understanding
MWh	Mega Watt Hour
NEPCO	National Electric Power Company
NERC	National Energy Research Centre
Mt	Metric Ton
NPV	Net Present Value
OMC	Oil Marketing Company
PAT	Perform, Achieve & Trade
PJ	Peta Joules
QA/QC	Quality Assurance / Quality Control
RE	Renewable Energy
SCADA	Supervisory Control and Data Acquisition
SEC	Specific Energy Consumption
TJ	Tera Joules
TOE	Tons of Oil Equivalent
USAID	United States Agency for International Development

1.0 BACKGROUND

The USAID Energy Sector Capacity Building (ESCB) Activity has been working with Jordanian energy sector partners to cultivate effective policies and decision-making in the energy sector; and to build sustainable institutional and organizational capacity in support of renewable energy and energy efficiency technologies and practices. ESCB also places a high priority on addressing gender issues in the energy sector, especially promoting women's inclusion and advancement in energy-related careers.

ESCB started in July 2013 and has been running for three years. It applies a broad, adaptable approach to meet the energy sector's evolving needs, including:

1. Development and adoption of a utilities incentive mechanism to promote energy efficiency, including a robust monitoring, evaluation, and validation system;
2. Increasing the institutional capacity of the Jordanian energy sector partners including the Ministry of Energy and Mineral Resources, Electricity Regulatory Commission, and electricity production, distribution, and transmission companies;
3. Strengthening the presence, capacity and regulation of energy services providers through market research, business development services, accreditation of those companies, and the creation of a coalition of energy services association; and
4. Flexible response mechanism for emergent energy sector needs and opportunities on a demand-driven basis.

The activities and results described here were part of ESCB's effort to increase the capacity of the Ministry of Energy and Mineral Resources and its sister ministries and agencies to plan and implement energy-saving measures on their physical facilities.

1.1 General Energy Indicators in Jordan

Jordan imports most of its energy resources. According to the Ministry of Energy and Mineral Resources (MEMR), the cost of consumed energy in 2014 was around 4,480 million JDs which account for around 86.8% of its total exports and 27.7% of total imports of goods and services and 17.6% of its Gross Domestic Products (GDP). Energy consumption has been growing steadily over the past decade. Primary and final energy consumption in 2014 grew by 3.6% and 2.25% respectively¹. Electricity consumption grew by 16.7% from 2010 through 2015. Implementation of energy efficiency (EE) measures is essential in facing future challenges of the growing energy and electricity demands.

Table 1: General Economic Indicators²

Details	2011	2012	2013	2014	2015
Population ('000)	6,250	6,388	6,530	6,650	6,514
GDP (Million JD) at Current Price	20,477	21,965	23,852	25,437	26,637
GDP Per Capita (JD)	3,276	3,432	3,652.7	3,825	4,089
Energy Intensity (Kgoe/1000\$ in fixed price)	209	208	208	207	207
Per Capita Primary Energy Consumption (kgoe)	1,193	1,247	1,249.2	1,272	1,373
Per Capita Consumption of Electricity (KWh)	2,166	2,230	2,234.8	2,318	2,483
Population Supplied with Electricity (%)	99.9	99.9	99.9	99.9	99.9

¹ Data from Department of Statistics (DOS), Jordan - 2015

² Data from Department of Statistics (DOS), Jordan 2015

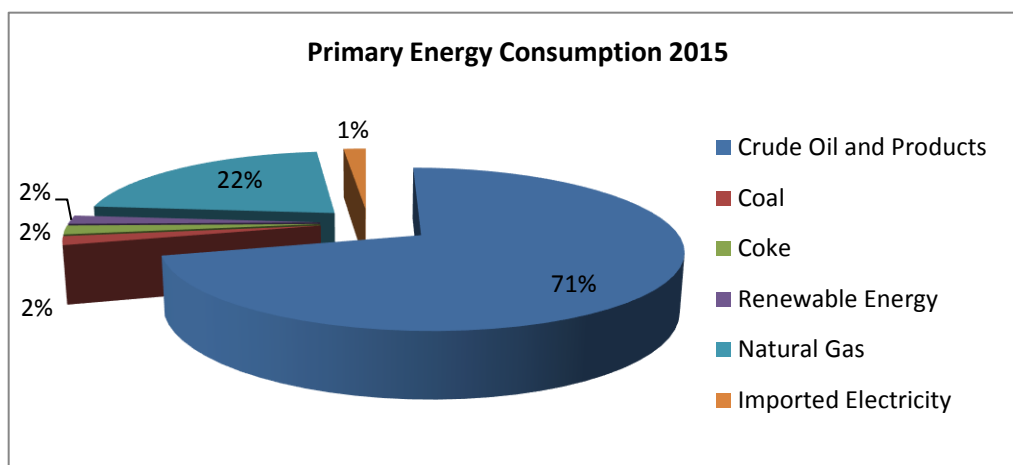


Figure 1: Primary Energy Consumption in 2015 (DOS, 2015)

The total Primary and final Energy Consumption in 2015 was 89.44 Million TOE and 58.28 Million TOE respectively. The consumption of petroleum products and electricity was 17.05 Million TOE and 16,173 GWh respectively. Consumption of petroleum products and electricity grew by 17.24% and 5.4% in 2015³.

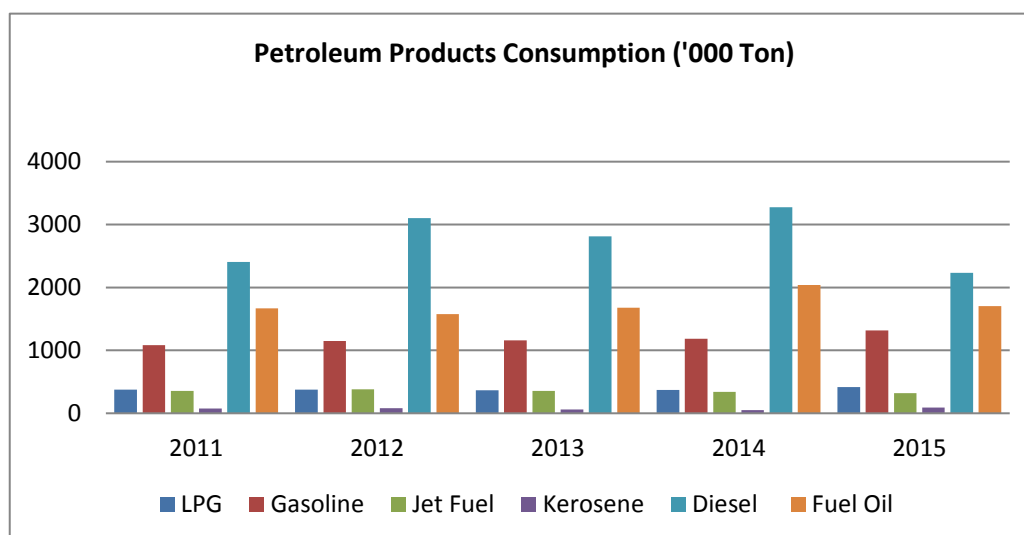


Figure 2: Petroleum Product Consumption 2011-2015 (DOS, 2015)

³ Data from Department of Statistics (DOS), Jordan 2015

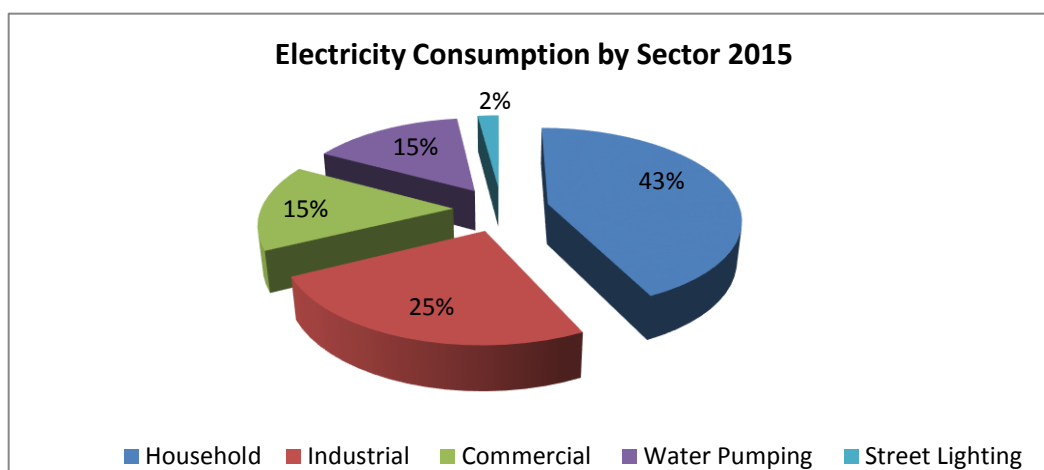


Figure 3: Electricity Consumption by Sector in 2015 (DOS, 2015)

1.2 About the Inception Report

This Inception Report was developed based on the Inception Mission conducted between 17th and 28th July 2016 by the IIEC team as part of the Sub-contract to “Support implementation of the bylaw regarding Compulsory Energy Audits for large energy consumers in Jordan”. As per Bylaw No. 73, Compulsory Energy Audits are required for all facilities consuming more than 50 toe of energy every year.

The objective of this report is to present the findings of the Inception Mission and the agreed scope of work and timelines for deliverables. The details about the kick off meetings conducted with key stakeholders in Jordan and the plan for future missions to Jordan are also presented.

2.0 ABOUT THE ASSIGNMENT

2.1 Introduction

Jordan's National Energy Efficiency Action Plan (JNEEAP), issued in 2007 and updated in 2013, sets a target of reducing energy consumption among all energy consuming sectors by an average of 20% (compared with 2007) by 2020. In the year 2012, Jordan issued Bylaw No. 73 for regulating the procedures and means of conserving energy and improving its efficiency issued by virtue of Article 18 of the Renewable Energy and Energy Efficiency Law No. 13 in the year 2012.

Bylaw No. 73 aims to set the general policy of energy conservation and improvement of its efficiency, submit it to the cabinet for endorsement and enact the plans and programs necessary for its implementation. The Bylaw also encourages investment in the field of conserving energy and improving efficiency of its use. It will help in monitoring energy audit procedures and the implementation of systems and activities related to conservation of energy and improving efficiency of its use, and in taking the necessary measures for the implementation of the emergency plan to reduce energy consumption.

The Bylaw encourages spreading the national awareness in the field of conservation of energy and improvement of its efficiency and helps in establishing a database related to conservation of energy and improvement of its efficiency.

The USAID-funded Energy Sector Capacity Building (ESCB) Project is committed to developing the financial, regulatory, and legal enabling frameworks needed to scale-up energy efficiency and renewable energy in Jordan. The ESCB project is helping in implementation of RE and EE activities through three main tasks:

1. Policies that support investment in energy saving measures;
2. Building the institutional capacity needed for effective management of the energy sector; and
3. Supporting the private sector to provide clean energy technologies and services.

Bylaw No. 73, 2012

In general, the Bylaw focuses on:

- **Setting forth** the general policy for conserving energy and efficient consumption
- **Promoting** investment in energy conservation and efficiency programs
- **Monitoring** energy audit activities and implementing regulations and activities related to safeguarding energy and its efficient use
- **Adopting** measures needed to carry out emergency plans for energy conservation
- **Spreading** national awareness on energy efficiency and conservation
- **Providing** opinions on projects expected to consume large amounts of energy
- **Establishing** a database to support conserving energy and improving efficiency

Article (3) of the Bylaw lays out the additional responsibilities of the Ministry to set energy conservation policies and promote efficiency. It also encourages the investments in improving energy efficiency and increase awareness in the field of energy conservation.

Article (4) mandates that the consumer shall comply with policies and procedures of conserving energy and improving its efficiency as specified under the directives issued for such a purpose, including compliance with the building codes for energy saving.

Article (5) places requirements on large consumers, making them subject to mandatory and periodic energy audits carried out by parties licensed according to the provisions of this Regulation, with the details of the auditing regime to be set out according to subsequent instructions.

Article (6) requires energy auditors to be licensed before offering energy audit services. The Ministry is responsible for specifying the license conditions and procedures, in accordance with subsequent instructions.

A key ESCB activity is supporting the Ministry of Energy and Mineral Resources (MEMR) to implement policies contained in the 2007 Energy Strategy, the Renewable Energy and Energy Efficiency Law, and the 2012 National Energy Efficiency Action Plan⁴.

2.2 Objectives of the Assignment

- Work with ESCB to support MEMR's implementation of Bylaw No. 73 (2012) - Regulating Procedures and Means of Conserving Energy and Improving its Efficiency;
- Identify which organizations/facilities are subject to the Bylaw;
- Develop a strategy to help organizations/facilities subject to Bylaw No. 73 to comply with its requirements;
- Build MEMR's capacity to implement the Bylaw and oversee compliance by organizations/facilities subject to the Bylaw.

2.3 Overall Scope of Work

The main purpose of the assignment is to provide capacity building and technical assistance in support of implementing the instructions regarding compulsory energy audits for all facilities consuming more than 50 tons of oil equivalent (toe). The assignment includes will supporting MEMR in justifying or recommending changes to the details of the existing policy on compulsory energy audits, and developing new approaches to enlist support for the policy from the private sector.

The International Institute for Energy Conservation (IIEC) is expected to deliver the technical assistance and capacity building on compulsory energy audits over the course of ten months starting from June 2016 and ending in March 2017. IIEC experts will conduct the required missions to Jordan to work with the local stakeholders to facilitate the timely completion of assigned tasks. The work is organized into the following tasks:

Task 1 – Appraise the background, results-to-date and current status of implementing Bylaw No. 73 regarding compulsory energy audits for large energy consumers

IIEC will work closely with MEMR, Chamber of Industry, and other stakeholders to determine the current status of efforts to implement the Bylaw. IIEC will review the origin and rationale behind key elements of the Bylaw, notably the specification of 50 toe as the consumption threshold for organizations/facilities to be subject to the provisions of the Bylaw. IIEC will review any draft Implementation Instructions or Regulations developed to date and any efforts underway to create a database of large energy consumers in Jordan.

IIEC will prepare an inception report incorporating the appraisal of status and results-to-date and will present the initial appraisal to MEMR management.

Task 2 – Review international experience with policies requiring compulsory energy audits for large consumers, and identify “lessons learned” which are applicable to Jordan

IIEC will review the international experience on compulsory energy audit programs for large consumers and present good examples from other countries similar to Jordan and will pay particular attention to the following aspects of such policies: (i) selecting the consumption threshold for large

⁴ 2007 Energy Strategy: <http://www.nerc.gov.jo/Download/english%20-energy%20strategy.pdf>
Renewable Energy and Energy Efficiency Law of 2012: <http://www.ilo.org/dyn/natlex/docs/ELECTRONIC/94599/111048/F-1870188604/Clean+Version-Final-Renewable+Energy++Energy+Ef.pdf> National Energy Efficiency Action Plan: <http://www.rcreee.org/content/jordan-energy-efficiency-action-plan-neeap>

consumers; (ii) constructing a database of consumers subject to the compulsory energy audit policy, and tracking the actions taken as a result of the audit; (iii) providing support to alleviate the financial burden of conducting the compulsory audits; and (iv) other policies that complement the compulsory energy audit requirements. IIEC will prepare a report including recommendations for which elements of international good practice on compulsory energy audit policies could be transferred to Jordan. IIEC will also develop a presentation and conduct a workshop for MEMR, Chamber of Industry, and other stakeholders including large consumers.

IIEC's review will include (but not limited to) the following countries known to have well-developed compulsory energy audit requirements for large energy consumers like Japan, China, Vietnam, Korea, India, the European Union, Turkey, Tunisia, Lebanon, and Algeria⁵.

Task 3 – Develop a methodology for determining who is covered by the compulsory energy audit requirements contained in Bylaw No. 73, and data required to make this determination

IIEC will work closely with MEMR, NEPCO, EMRC, electricity distribution companies, JPRC, Jordan Bureau of Statistics, authorized petroleum product distributors (Manaseer, Jordan Petroleum, and Total) and other stakeholders to develop a methodology for determining who is covered by the compulsory energy audit requirements. IIEC will also identify the data needed for this determination by sector, which organizations have the data, and what would be required for MEMR to access the data.

Task 4 – Review the existing Bylaw No. 73 regarding compulsory energy audits (Articles 2, 3, 4 and 5), especially the reasonableness of the definition of a “Large Energy Consumer”, and suggest improvements or revisions

IIEC will review all elements of Bylaw No. 73 that relate to compulsory energy audit policy to identify improvements or revisions. In particular, IIEC will consider the reasonableness of the definition of a large consumer (50 toe annual energy consumption) established in Article 2 of Bylaw No. 73. In reviewing the reasonableness of this threshold, IIEC will take into account practical considerations (how many facilities would be covered and the administrative burden of tracking the compliance of these facilities), financial considerations (cost burden on Jordan's private sector), data considerations (difficulty in obtaining the necessary energy consumption by fuel type) and overall contribution to Jordan's national energy-saving targets.

Based on this review and the review of international experience on compulsory energy audit policies for large consumers, IIEC will recommend changes or improvements in elements of Bylaw No. 73 related to compulsory energy audits. For example, IIEC might suggest different thresholds according to consuming sector or according to type of energy consumed or exemptions to the compulsory energy audit for certain types of consumers. IIEC will prepare a report on the reasonableness of the compulsory energy audit related requirements contained in Bylaw No. 73, including suggestions on how to refine, apply and interpret or if necessary revise the language of the existing Bylaw. IIEC will present the results of this review to MEMR, the Chamber of Industry, and other relevant stakeholders.

Task 5 – Design and develop a database for the facilities covered by the compulsory energy audit requirements of Bylaw No. 73

⁵ See: <http://www.iea.org/policiesandmeasures/renewableenergy/>

IIEC will work with MEMR to design and develop a database for the organizations/facilities covered by Bylaw No. 73's compulsory energy audit requirement. IIEC will coordinate this effort with the parallel effort by MEMR, supported by the EU and being undertaken by the Chinese consortium China Power Engineering Consulting Group/Beijing North-Star Technology Development Co, to develop a master information system and database for MEMR. IIEC will present the design of the database to MEMR and other stakeholder for their comments. IIEC will support MEMR to collect all information required to maintain the database, and will also recommend a process to periodically update the database, including developing reporting requirements for organizations/facilities found to be subject to the compulsory energy audit requirements of Bylaw No. 73.

Task 6 – Consider and recommend additional and complementary policies to support large consumers in complying with the compulsory energy audit requirements of Bylaw No. 73

IIEC will work closely with MEMR, Chamber of Industry, and other relevant stakeholders to identify additional and complementary policies to support large consumers in conducting the required energy audits. Potential supporting and complementary policies to be considered should include: (i) conditional grants from JREEEF to offset the initial cost of performing the compulsory energy audit; (ii) project preparation facility to support large consumers in taking forward energy saving measures identified in the audit report; (iii) feed-in tariffs for energy efficiency projects submitted under Article 11 (b) of Bylaw No. 73; and (iv) awareness-building, outreach and energy efficiency project demonstrations to show large consumers the business benefits of energy saving measures. IIEC will develop a report which reviews the additional and complementary policies reviewed and which are recommended. IIEC will present these results to MEMR, the Chamber of Industry, and in a workshop for relevant stakeholders including large consumers.

Task 7 – Develop proposed Implementation Instructions and Requirements

IIEC will work closely with MEMR and other stakeholders to develop clear instructions for implementing Bylaw No. 73's articles pertaining to compulsory energy audits for large consumers. IIEC will work with MEMR to organize and participate in a workshop to present the proposed instructions for comment to the affected organizations/facilities and related stakeholders. IIEC will work with MEMR to incorporate the comments received before finalizing the implementation instructions. The instructions shall include additional policies to support targeted consumers in complying with the Bylaw.

Task 8 – Assist MEMR and other stakeholders to acquire the technical and management capacity needed to implement the new instructions

IIEC will help build the institutional and technical capacity to implement the approved recommendations. IIEC will support build the capacity of the MEMR, and other stakeholders through awareness sessions and technical trainings on implementing the Instructions developed in Task 7. IIEC will prepare a procedures manual based on the Implementation Instructions and train the MEMR staff using this manual.

2.4 Scope of Work for Inception Mission

The scope of work for the Inception Mission is presented below.

- 1. Conduct kick-off meetings** with counterparts, partners, stakeholders, and constituencies. Identify key needs and key issues needing resolution to complete the assignment.

2. **Collect information** necessary to appraise the background, result-to-date and current status of implementing Bylaw No. 73 on Compulsory Energy Audits for large energy consumers.
3. Based on the review of successful international experience, **begin identifying** “lessons learned” which are applicable to Jordan.
4. **Conduct local background research** needed to develop a methodology for who should be covered by the Compulsory Energy Audit requirements under Bylaw No. 73. Identify data sources and gaps in existing data needed to make this determination.
5. Drawing on international experience, **discuss the reasonableness** of the definition of a “large energy consumer”, and suggest improvements or revisions.
6. **Discuss the requirements** for a database of facilities covered by the compulsory energy audit requirements of Bylaw No. 73.
7. Drawing on international experience, **begin discussing additional policies** to support large consumers in complying with the compulsory energy audit requirements.

3 FINDINGS OF INCEPTION MISSION

As part of the Inception Mission, the team of IIEC experts including Mr. Sanjay Dube, Vice President, South Asia, Mr. Sommai Phon-Amnuaisuk, Vice President, Asia Pacific and Mr. Dilip Limaye, Advisor, IIEC visited Jordan between 17th and 28th July 2016. During the mission, the team conducted meetings with the ESCB project team and the key stakeholders in Jordan. The purpose of the inception mission was to confirm the scope of work, get introduced to the stakeholders, establish clear terminology, answer any remaining questions and concerns, and outline the methods of communication internally and externally for the duration of the project.

3.1 Meetings Conducted During Inception Mission

The IIEC team conducted a number of meetings with the Ministry of Energy and Mineral Resources (MEMR) and other key stakeholders. The detail of the key meetings held is provided below. The detailed meeting notes are attached as Annex A of this report.

Table 2: Stakeholder Meetings Conducted during the Inception Mission

Date	Time & Day	Person & Agency
17-Jul-16	9.30 am Sunday	Grayson Heffner, Resident Advisor, ESCB, Eng. Ghassan Naji, Senior DSM Planner, ESCB
17-Jul-16	2.00 pm Sunday	Eng. Abdessalam Rashaideh, Director IT, MEMR
18-Jul-16	9.00 am Monday	Eng. Ziyad Jibril, Director, Renewable Energy, MEMR
18-Jul-16	11.00 am Monday	Sayyeda Ruba Al-Zubi, CEO, EDAMA
19-Jul-16	9.00 am Tuesday	Eng. Ashraf Rawashdeh, Director, Oil & Petroleum Products Department, MEMR
19-Jul-16	11.00 am Tuesday	Dr. Maher H. Al-Mahrouq, General Manager & Dr. Iyad Abu Haltam, Member Board of Directors (Secretary General), Jordan Chamber of Industries
19-Jul-16	1.00 pm Tuesday	Eng. Walid Shahin, Director, NERC
20-Jul-16	11.00 am Wednesday	Prof. Mohammad H. F. Dado, CEO, Prof. Ahmed Al-Ghandoor, Partner & Ismael Al-Hinti, Partner, ETA MAX
20-Jul-16	2.00 pm Wednesday	Eng. Hasan Suboh, General Manager, Eco SOL
21-Jul-16	10.00 am Thursday	Mr. Nimer Hashem, In-Charge, Energy & Economy Cell, Department of Statistics, Ministry of Planning
21-Jul-16	11.45 am Thursday	Abdel-Motaleb Al-Nugrush, Director, Statistics & Information Unit, MEMR
25-Jul-16	9.00 am Monday	Eng. Wijdan Al Rabadi, Commissioner, Energy & Minerals Regulatory Commission (EMRC)
26-Jul-16	11.00 am Tuesday	Sabri S. Al Khassib, Director of Economic Policies & Studies, Amman Chamber of Commerce
28-Jul-16	11.00 am Thursday	Grayson Heffner, Resident Advisor, ESCB, Eng. Ghassan Naji, Senior DSM Planner, ESCB
28-Jul-16	3.30 pm Thursday	USAID De-brief meeting with Mr. Yasser Bayado, Program Manager, USAID, Marry Worzala, Chief of Party, ESCB, Eng. Ghassan Naji, Senior DSM Planner, ESCB

The meetings were helpful in terms of developing an understanding about the background, results-to-date and current status of implementing Bylaw No. 73 regarding compulsory energy audits for large energy consumers. The team reviewed the origin and rationale behind key elements of the Bylaw, notably the specification of 50 tons of oil equivalent (toe), which has been set as the consumption threshold for organizations/facilities to be subject to the provisions of the Bylaw. The team also reviewed the draft Implementation Instructions or Regulations developed to date and how to assist MEMR in creation of a database of large energy consumers in Jordan.

3.2 Implementation Issues Highlighted by Stakeholders

The desk research and the meetings conducted during the Inception Mission helped in identifying the key issues in implementation of Bylaw no. 73. The key issues are discussed below:

a. Energy Information of MEMR (eis.memr.gov.jo): The recently completed energy information system is a web-based database system compiling daily, monthly and yearly energy supply data (oil, gas and electricity). The system has a menu for “electricity consumption by company”, however it shows only electricity consumption data from distribution companies [*Electricity Distribution Company (EDCO)*, *Irbid District Electric Company (IDECO)* and *Jordan Electric Power Company (JEPCO)*] and large customers directly supplied by National Electric Power Company (NEPCO). Disaggregated electricity consumption at consumer level is not yet available from the system. The energy consumption data in the current energy information system is mainly used by MEMR in calculation of ‘Energy Balance’ at the national level, however it is not sufficient to support evaluation of appropriate energy consumption threshold for Bylaw No. 73 (which currently specifies 50 toe as threshold). The data is also not sufficient to support the implementation of compulsory energy audits.

The 50 toe threshold includes the consumption of both electricity and oil and petroleum products. The Energy Balance calculated by MEMR includes the data for oil and petroleum but it is mainly the supply side data that is collected by MEMR. The consumption data for oil and petroleum products for individual consumers is not collected by MEMR. The data on the consumption of heavy fuels is held by the Jordan Petroleum Refinery Company (JPRC) and the data for distillates - diesel, kerosene, LPG, Gasoline, Natural Gas and other products - is held by the three Oil Marketing Companies (OMCs), Manaseer, Total, and JoPetrol. This data does not appear to reside in any government data bases.

b. Electricity Consumption by Consumer Accounts: The initial analysis of the available 2013 nationwide electricity consumption data for consumer accounts under each tariff classification shows that at 50 toe threshold, approximately 1,200 electricity consumer accounts will be classified as designated entities based on their electricity consumption alone. It is worth noting that the number of consumer accounts may not correspond to the number of consuming entities, since one consumer/entity may have more than one account. The number of designated consumers will also increase once fuel consumption data is introduced into the analysis.

c. Capacity of Local Energy Services Providers to Perform Energy Audits and Implement Energy Conservation Measures: There are only 3-4 ESPs in Jordan and each one of them cannot conduct more than 20 energy audits in a year. Jordan’s existing energy services industry is not sufficient to support more than 100 energy audits per year. Institutional arrangement and capacity of MEMR to operationalize the compulsory energy audit scheme (certifying auditors, reviewing energy audit results, implementing consumer awareness, etc.) will need to be strengthened to enhance confidence and encourage participation of the private sector in the compulsory energy audit scheme. The requirement to license of energy audit providers under Article 6 of Bylaw No. 73 will likely be a further limiting factor in terms of conducting energy audits.

d. Supporting Policies for Implementation of Compulsory Energy Audit Scheme: The policy measures and procedures needed to support implementing compulsory energy audits have not yet developed. Bylaw No. 73 became effective in 2012 and over the last 4-years only limited efforts have been made to implement the policy. The Jordan Renewable Energy and Energy Efficiency Fund (JREEFF), established under the Renewable Energy & Energy Efficiency Law No 13 of 2012, is a positive step taken by MEMR to support renewable energy and energy efficiency in Jordan. JREEFF has developed innovative financing mechanisms to implement energy efficiency in small and medium size industries. Jordan needs additional supporting policies to ensure the implementation of compulsory energy audits and energy conservation measures in large industries in Jordan.

e. Lack of Clarity to Commercial and Industrial Stakeholders about the Provisions under Bylaw No. 73: The interviews conducted with the Jordan Chamber of Industries, Chamber of Commerce, Amman and the Energy Service Providers in Jordan have revealed that large consumers do not understand the rationale behind Bylaw No. 73, and are concerned about how it might be implemented. In particular they are concerned about the cost, the coverage, and the non-compliance penalties that may be associated with a compulsory energy audit.

- i. The basis of selection of the 50 toe threshold limit set for compulsory energy audits was a concern. Stakeholders believe that too many small commercial and industrial consumers will be designated as large consumers and subject to compulsory energy audits. As described above, Jordan does not have the capacity to conduct and implement large number of energy audits.
- ii. The reason for introducing a Compulsory Energy Audit policy. Industrial and commercial consumers maintain they are knowledgeable about energy efficiency and implement energy efficiency measures according to their requirements; thus mandatory regulations are not needed.
- iii. Who will bear the costs for energy audits? MEMR should develop a policy for financing of energy audits.
- iv. What will be the frequency of compulsory energy audits (3-year, 5-year- or more)? Industry does not want to conduct the audits very frequently.
- v. Both Chambers suggest that only large industry should be targeted for the implementation of compulsory energy audits and the program should be implemented in phases with the largest consumers audited first.
- vi. Stakeholders expressed concern about penalties for not complying with the energy audit policy, although there are no penalties mentioned in Bylaw (73). This points to the need for better communication and consultation regarding how the policy will be implemented.

f. Communication and Awareness Campaigns: During the meetings, both the public and private sector stakeholders have highlighted the need for extensive communication and awareness campaigns to raise the awareness of industry. MEMR should organize focused stakeholder consultations to understand the market issues and to mobilize the support of industry.

3.3 How to Define ‘Large Consumers’ for Compulsory Energy Audits

The IIEC team conducted an initial analysis to estimate the number of large consumers subject to compulsory energy audits. The analysis used 2013 electricity consumption data converted to tons of oil equivalent (toe) and plotted against the different categories of non-residential consumers. The analysis estimates how many consumer accounts would be covered according to where the threshold is set for being subject to a compulsory energy audit. Figure-4 shows that approximately 1200 consumers would be subject to a compulsory energy audits if a 50 toe threshold is used whereas only 84 consumers would be subject to a compulsory energy audits if a 500 toe threshold

is used. Note that the analysis does not include the oil and petroleum product consumption data; the number of covered consumers would surely rise if non-electricity energy consumption was included. Setting the consumption threshold affects not only who is covered but how long it will take to implement the policy. If 1200 consumers are covered, the Energy Service Providers (ESPs) will be unable to conduct the energy audits in a timely manner.

A detailed analysis will be conducted by the IIEC team once the latest electricity and oil and petroleum product consumption data is available. ESCB has requested all the three electricity distribution utilities and the JPRC to provide the data for each consumer falling under different tariff categories. The analysis conducted with the available data for top 100-200 consumers will help in defining the 'large consumer' for compulsory energy audits.

Once the 'large consumers' are defined, the IIEC team will suggest the suitable thresholds for conducting compulsory energy audits for commercial and industrial consumers in Jordan.

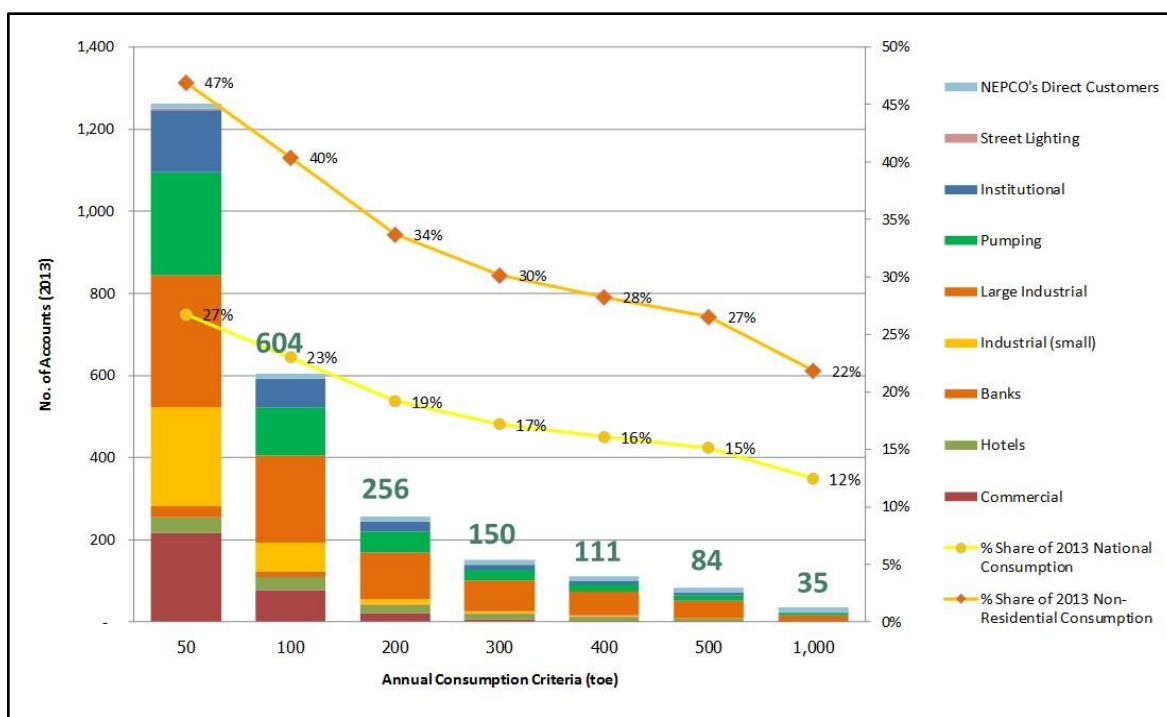


Figure 4: Annual Energy Consumption v/s Number of Consumer Accounts

3.4 Review of International Experience

Many Governments stimulate energy efficiency activities by introducing laws and regulations requiring or encouraging large energy consumers to take action. Energy Audit Programs (mandatory/voluntary) are one such regulatory action. Related institutional, regulatory and legal policies include:

- Energy Performance Targets
- Implementation of Energy Audits
- Certification of Energy Managers
- Mandatory Reporting of Energy Consumption
- Adoption of Standards like ISO 50001

Key Aspects of the Compulsory Energy Audit Programs

Compulsory energy audit programs or energy efficiency measures are often combined with fiscal and financial support policies. The important aspects of these programs are discussed below.

- **Reasons for Introduction of Program** – Strong increase in energy prices, greater energy needs for growth and expected shortages of energy supplies.
- **Target Sectors** – Normally legislation for mandatory audits cover all sectors, but examples also exist for only industrial coverage in some countries.
- **Threshold** – Ranges from **260 toe (3,000 MWh) in Bulgaria** to **30,000 toe in India**, also dependent on the size of the companies in a country. Thresholds also differentiate between sectors or energy carriers, for e.g. in Czech Republic much lower threshold for government facilities.
- **Features** – Wide variety of mandatory features are observed ranging from soft approach in Australia, aiming at business cultural changes to strong regulatory approaches in India, Taiwan or Bulgaria, which include mandatory standards for industrial processes.
- **Period** – Typical period of renewal of audits 3-5 years, but there are also examples of Romania with shorter periods 1-2 years, and Czech Republic with only a one-time audit requirement.
- **Financial Support** – Despite the mandatory nature, in order to enhance compliance or ensure implementation of energy saving measures, countries have provided financial support for both financing the audits and implementation of EE measures.
- **Databases** – All countries have maintained databases for using the information to generate benchmarks or feedback. The central body in charge of the program maintains the database. The data is the most important component of these programs.
- **Sanctions for Non-Compliance** – Often include fines. In Taiwan, restrictions or suspension of energy supply is a sanction. However, there appears to be no evidence of enforcement of such sanctions.

The table and the diagram below present the details about the mandatory audit programs and thresholds⁶ in different countries.

⁶ Global CCS Institute Publication. 3.5 – Mandatory Energy Audits

Table 3: Countries and Thresholds for Compulsory Energy Audits

Country	Threshold	Unit	Conversion to toe	Plot Value (toe)	Note
Jordan	50	toe	1	50	
Bulgaria	3000	MWh	0.086	258	Industry: 3000 MWh
Thailand	20	TJ	23.88459	478	Industry: 20 TJ, 1000 kW
Romania	1000	toe	1	1,000	1000 toe
Tunisia	1000	toe	1	1,000	Industry: 1000 toe
Turkey	1000	toe	1	1,000	Industrial establishments consuming more than 1,000 toe are obliged to report their energy consumption to the EIE and have an energy manager to monitor EE.
Algeria	2000	toe	1	2,000	Industry: 2000 toe
South Korea	2000	toe	1	2,000	Since 2007 large energy consumers (over 2 ktoe/year) to carry out mandatory energy audits every 5 years.
Japan	33510	MWh	0.086	2,882	Energy Managers to conduct audits in Type 1 & 2 factories.
Taiwan	6000	Mt of Coal	0.7	4,200	Coal 6000t/y, Fuel oil 6000kl/y, Gas 10 mil. M ³ , Elec 1000 kW, Steam 100 t/h
Indonesia	6000	toe	1	6,000	EE Regulation (No. 70/2009) mandates large consumers consuming > 6,000 toe of energy to conduct energy audits & implement ECMs.
China (Top 10000 Program)	10000	Mt of Coal	0.7	7,000	Largest 15,000 enterprises consuming more than 10,000 Mt of coal per year.
Australia	0.5	PJ	23884.59	11,942	0.5 PJ
India	30000	toe	1	30,000	30,000 toe
China (Top 1000 Program)	180000	Mt of Coal	0.7	126,000	Largest 1008 enterprises consuming more than 180,000 Mt of coal per year

Source: Prepared by authors based on international review.

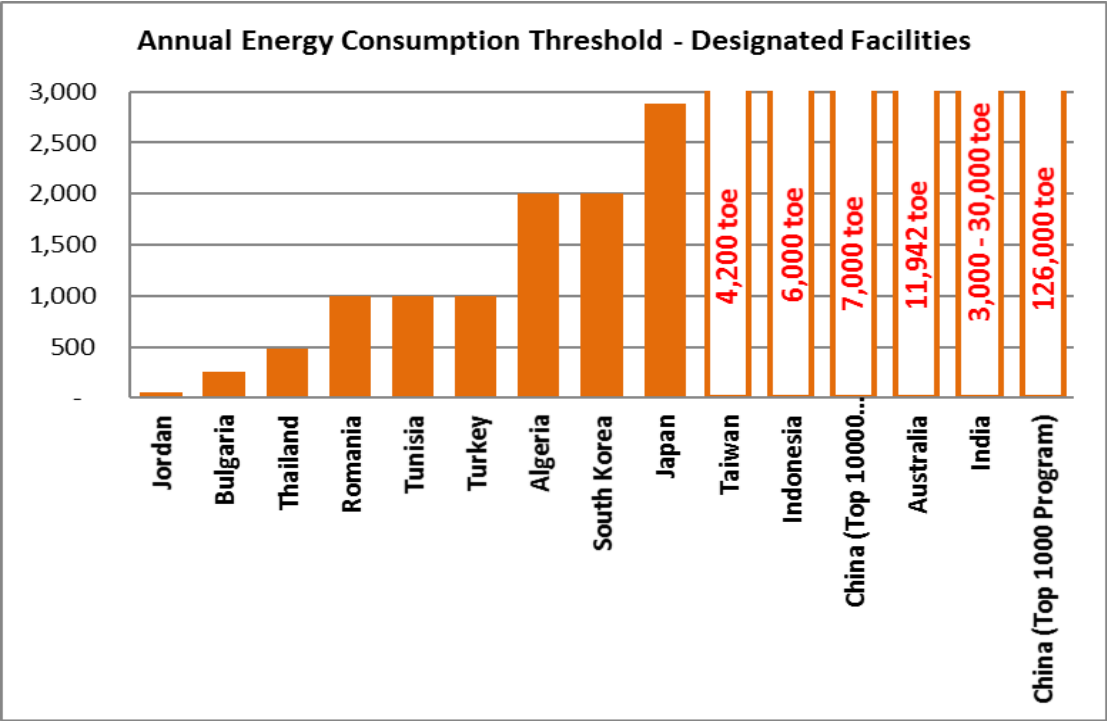


Figure 5: International Comparison of Thresholds for Compulsory Energy Audits

Source: Prepared by authors based on international review.

Table-3 and Figure-5 show that Jordan has by far the lowest threshold of 50 toe for compulsory energy audits. Thus it is important to re-assess the basis for setting up such low threshold.

3.5 Proposed Next Steps after Inception Mission

The immediate next steps for IIEC team after the submission of Inception Report are discussed below.

- **Follow-up and collection** of the oil and petroleum product and electricity consumption **data** for individual customers from JPRC, OMCs and from the three utilities (JEPCO, EDCO & IDECO). The letters have been drafted for MEMR for sending them to all the three electricity distribution utilities, JPRC and the three OMCs in Jordan.
- **Continue reviewing** the experiences and the **lessons learned from international examples** to assess implications for Jordan. Also identify supportive policies and programs, which can be introduced in Jordan to support the implementation of compulsory energy audit scheme.
- **Conduct data analysis to define “large consumers”** for compulsory energy audits. Also define who should be covered by the compulsory energy audits.
- **Prepare the plan for a stakeholder workshop** to be organized in November 2016 for presenting the findings and also to capture stakeholder perspectives on implementation of Bylaw No. 73. The workshop will provide the opportunity to present the international examples, suitable strategy for Jordan, and capture the views of large commercial and industrial consumers for the implementation of compulsory energy audit program.
- **Work on additional compulsory supportive policies** to support the implementation of Bylaw No. 73.
- **Identify and work on capacity building tools and procedures** manuals to help build the institutional and technical capacity of MEMR and other stakeholders to implement the approved recommendations. IIEC will also organize awareness sessions and technical trainings on implementing the instructions at the end of the assignment for MEMR staff.

4.0 DELIVERABLES AND TIMELINE

4.1 Deliverables as per the Contract

The task wise outcomes and deliverables and the level of efforts for IIEC team are presented in table-5 below. The key deliverables and the timeline are presented in table-6.

Table 4: Tasks, Outcomes, Deliverables and LOE for IIEC

Tasks	Outcomes and Deliverables	LOE-Days
1. Appraise the background, results-to-date and current status of implementing Bylaw No. 73 regarding compulsory energy audits for large energy consumers.	<ul style="list-style-type: none"> • Inception report, including an appraisal of the background, results-to-date and current status of implementing Bylaw No. 73 regarding compulsory energy audits for large energy consumers • Presentation to Management 	10
2. Review international experience with policies requiring compulsory energy audits for large consumers, and identify “lessons learned” which are applicable to Jordan.	<ul style="list-style-type: none"> • Review of international experience with policies requiring compulsory energy audits for large energy consumers, including practices from other countries which could be transferrable to Jordan. • Presentation and workshop for MEMR, Chamber of Industry, and other stakeholders 	10
3. Develop a methodology for determining who is covered by the compulsory energy audit requirements contained in Bylaw No. 73, and data required to make this determination.	<ul style="list-style-type: none"> • Methodology for identifying the facilities subject to Bylaw No. 73 • Data requirements, who holds the data, and a strategy for accessing the data 	10
4. Review the existing Bylaw No. 73 regarding mandatory energy audits (Articles 2, 3, 4 and 5), especially the reasonableness of the definition of a “large energy consumer”, and suggest improvements or revisions	<ul style="list-style-type: none"> • Report on the reasonableness of the mandatory energy audit related requirements contained in the Bylaw • Suggestions on how to refine or apply or interpret the language of the existing Bylaw without having to revise the Bylaw itself. • Presentation on the results of this review to MEMR and the Chamber of Industry 	10
5. Design and develop a database for the facilities covered by the compulsory energy audit requirements of Bylaw No. 73.	<ul style="list-style-type: none"> • Database design • Data collection • Recommended process to periodically update the database 	15
6. Consider and recommend additional and complementary policies to support large consumers in complying with the mandatory energy audit requirements of Bylaw No. 73.	<ul style="list-style-type: none"> • Report reviewing additional and complementary policies reviewed and which are recommended. • Presentation on additional policies recommended for MEMR and the Chamber of Industry • Workshop on policy recommendations for large consumers and stakeholders. 	10
7. Develop proposed Implementation Instructions and Requirements	<ul style="list-style-type: none"> • Implementation Instructions and Requirements • Additional policies to support targeted consumers in complying with the bylaw 	15
8. Assist MEMR and other stakeholders to acquire the technical and management capacity needed to implement the new instructions.	<ul style="list-style-type: none"> • Trainings • Implementation Instructions Procedures manual 	10
Subtotal LOE		90
Travel days	8 missions – 12 days each – 2 travel days/mission	16
Total LOE (days)		106

Table 5: Deliverables and Timeline

S. N.	Deliverables	Timeline
1.	Inception report, including an appraisal of the background, results-to-date and current status of implementing Bylaw No. 73 regarding compulsory energy audits for large energy consumers.	10 th August 2016
2.	Review of international experience with policies requiring compulsory energy audits for large energy consumers, including practices from other countries which could be transferrable to Jordan.	End September 2016
3.	Presentation and workshop on international experience with compulsory energy audit policies for MEMR, Chamber of Industry, and other stakeholders including large consumers.	November 2016
4.	Methodology for identifying the facilities subject to Bylaw No. 73.	November 2016
5.	Review of the reasonableness of energy consumption thresholds contained in Bylaw No. 73, including recommendations for how to interpret and implement the threshold.	November 2016
6.	Database of organizations/facilities identified as being subject to Bylaw No. 73.	November 2016
7.	Procedures for mandatory data collection and processes for updating the database.	February 2017
8.	Report on recommended additional and complementary policies to support large consumers in complying with the bylaw.	March 2017
9.	Proposed Implementation Instructions and Requirements, to include the additional policies and procedures to support large consumers in complying with the Bylaw No. 73.	March 2017
10.	Capacity building and training for MEMR needed to implement the mandatory energy audit requirements of Bylaw No. 73.	March 2017
11.	Final report	10 th April 2017

ANNEXURES

A. Stakeholder Meeting Details

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
17-Jul-16	2.00 pm Sunday	Eng. Abdessalam Rashaideh, Director IT, MEMR	Grayson Hefner, Ghassan Nazi, Dilip Limaye, Sommai, Sanjay Dube & Leena	<ul style="list-style-type: none"> Meeting was organized to understand the process for energy sector data collection, analysis & availability. The Director informed that Italian Consultants designed the software and tools for SCADA system for data collection and analysis and Chinese consultants helped in development and implementation of the online database system. Database servers are located at the ministry. The daily/monthly/yearly economic and electricity supply data is supplied to the IT department by the utility companies and refinery The utility companies upload the data on daily basis using the SCADA system No SCADA system for the oil sector supply side data was available. The data was received on daily basis and uploaded manually. No demand-side data is being incorporated in the system at this stage. Each day a report is generated for the Ministry. The annual reports are generated for all kinds of data and they also conduct the energy balance. The data can be tracked on their website – eis.memr.gov.jo. 	<ul style="list-style-type: none"> Eng. Abdessalam Rashaideh promised to introduce the team to Mr. Abdel-Motaleb Al-Nugrush, Director of Statistics & Information Unit, MEMR Eng. Abdessalam Rashaideh also mentioned that they can reach out to the three electricity distribution utilities to get the electricity consumption data for various types of consumers.

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
18-Jul-16	9.00 am Monday	Eng. Zaid Jibril, Director, Renewable Energy, MEMR	Grayson Hefner, Ghassan Nazi, Dilip Limaye, Sommai, Sanjay Dube & Leena	<ul style="list-style-type: none"> Eng. Zaid was involved with the preparation process of By-law 73 and Article-5 before he took over the charge as Director, Renewable Energy. He suggested that EMRC may be able to provide the right justification for 50 toe threshold. He suggested that there should be different thresholds for different size of consumers (large/medium/small). He informed that World Bank in coordination with MEMR conducted a study on energy audits in Jordan couple of years back (most likely in 2006). He suggested that the team should meet Chamber of Commerce, Ministry of Public Works (building codes) and Chamber of Industries for getting more detailed information on demand side data. 	<ul style="list-style-type: none"> Set-up the meetings with suggested Ministries, industry and departments Get the World Bank report on the Energy Audits.
18-Jul-16	11.00 am Monday	Sayyeda Ruba Al-Zubi, CEO, EDAMA	Ghassan Nazi, Dilip Limaye, Sommai & Sanjay Dube	<ul style="list-style-type: none"> EDAMA wants to continue supporting the implementation of policies for energy efficiency EDAMA is involved in capacity building of industries in different areas including energy efficiency. They have 84 registered members. EDAMA has a MOU with Jordan Chamber of Industries in 2015 for providing the capacity building support to industries. EDAMA Informed that in the past Jordan Enterprise Development Corporation (JEDCO) offered to conduct free energy audits for the industries but no interest was shown, as industry believed that there is no 	<ul style="list-style-type: none"> EDAMA to provide the contact at JEDCO for collection of information on free energy audit program (energy & environment clinic). EDAMA to provide the contact of the consultant responsible for ongoing data collection for estimation of GHG emission reduction. EDAMA to introduce the consultants to Satch Net, the ESCO.

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
				<p>incentive for them especially when the energy prices are also low in Jordan.</p> <ul style="list-style-type: none"> ▪ EDAMA informed that Ahli Bank in Jordan has a scheme to support the financing of energy services. ▪ While checking about the availability of energy consumption data, EDAMA informed that Royal Scientific Society (RSS) and GIZ must have collected the data as they were involved in the preparation of INDC for Jordan. Ms. Ruba promised to introduce ESCB to GIZ contact person. ▪ Ms. Ruba also promised to introduce the consultants to one of the leading ESCO called Satch Net. ▪ Ms. Ruba highlighted that energy audit businesses in Jordan has been declining and large EE services companies go outside of Jordan. Small EE services companies do not have capacities to undertake complex energy audits. ▪ EDAMA informed that the industries have a fear of penalties for non-compliance if the By-law 73, Article-5 is implemented. This is due to the problem faced by the industry from the pollution department as some of the industries were asked to shut down due to non-compliance of pollution laws. ▪ EDAMA suggested that industrial estates have separate mandates for their clients and these can be included to support implementation 	

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
				of energy audits and EE implementation.	
19-Jul-16	9.00 am Tuesday	Eng. Ashraf Rawashdeh, Director, Oil & Petroleum Products Department, MEMR	Grayson Hefner, Ghassan Nazi, Dilip Limaye, Sommai, Sanjay Dube, Ola & Eng. Zaid Al Thaher (Project Engineer)	<ul style="list-style-type: none"> Eng. Ashraf informed that the By-law covers both oil and electricity. The Oil & Petroleum Product Department receive the supply and consumption data from MEMR's IT department. JPRC submits the data to MEMR's IT department on the use of heavy fuels on a daily basis. JPRC collects the data from large industrial consumers on the consumption of heavy fuels. The data on the use of gasoline, diesel, kerosene, and other products can be obtained from OMC's. The Oil & Petroleum Product Department needs an official mail from JREEEF for supplying the oil and fuel data to ESCB. He also suggested that JREEEF should write to JPRC and OMC's for the data on oil and other fuel consumption in Jordan. Eng. Ashraf believed that the 50 toe threshold set under the By-law 73 is quite low for Jordan. Eng. Ashraf also suggested about conducting a sample audit at a large industry to identify the low and no-cost opportunities. The audit and the implementation of audit recommendations can set an example for Jordan. 	<ul style="list-style-type: none"> Ola to write an email to Eng. Ashraf with a request to provide the supply and consumption data on oil and petroleum products. Prepare the draft letters for JREEEF to be sent to JPRC and the OMC's for data on consumption of oil and petroleum products by key consumers. Meet with Eng. Ashraf again to discuss about the available data and its use. Also the suggestions for setting up of different thresholds for different categories of industries and commercial consumers.
19-Jul-16	11.00 am Tuesday	Dr. Maher H. Al-Mahrouq, General Manager & Dr. Iyad Abu Haltam, Member	Grayson Hefner, Ghassan Nazi, Dilip	<ul style="list-style-type: none"> The Jordan Chamber of Industry (JCI) has objections on the implementation of mandatory energy audit program for the industries. The main objections included: 	<ul style="list-style-type: none"> A small presentation to be made to key personal at the Chamber in the week of 24th July on international examples on

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
		Board of Directors (Secretary General), Jordan Chamber of Industries	Limaye, Sommai & Sanjay Dube	<ul style="list-style-type: none"> ○ Mandatory nature of the By-law 73, Article-5. ○ The 50 toe threshold for mandatory audits. It is very low. As per the analysis by the Chamber, the last 5-year average is above 63 to 68 toe. Considering this, the industry consuming less than 75 toe should not fall under this program. Even this is very low. ○ Mandatory energy audits should be free of cost. ○ JCI has an impression that violation of By-law 73 will lead to closure of facilities. ○ The suggested 3-year period for compliance of the audit is very short. ▪ They believe that MEMR needs to re-think about the 50 toe threshold and should consider to revise this based upon the consumption by different categories of industries/consumers ▪ The program should cover only large size of industry and the implementation of the program should be in phases. ▪ When presented, they preferred PAT Scheme type of mechanism for Jordan. ▪ The Chamber can mobilize the industry if required for the implementation of the By-law. ▪ Chamber is already talking to JREEEF for financing the implementation of energy audits and EE implementation in small and 	<p>implementation of mandatory energy audit programs.</p> <ul style="list-style-type: none"> ▪ Request mail to be sent to the Chamber about energy consumption data from small, medium and large industries. ▪ Discuss the plan, scope, timeline, participants and other logistics with the Chamber for the proposed stakeholder workshop in September/October.

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
				<p>medium size industries. There is no mechanism available in Jordan for financing the energy audits and implementation of EE in large industries.</p> <ul style="list-style-type: none"> ▪ JCI mentioned that the Department of Statistics (DOS) has been conducting industrial surveys and updated data should be sought from DOS. ▪ JCI has around 70,000 members, most of which are micro. About 1,500 – 1,600 members are medium to large and about 10% of these are considered as large enterprises with more than 250 employees. (any establishment having more than 250 employees is categorized as large consumers in Jordan.) ▪ JCI classifies its members into 10 sectors. ▪ The Chamber also offered to organize the proposed stakeholder workshop at their facility near Circle No. 2 in September or October. The convention hall at Chambers office can accommodate 300 people. ▪ Finally, the Chamber proposed that the By-law should have the provision to level the penalties with some kind of innovative financing mechanism. 	
19-Jul-16	1.00 pm Tuesday	Eng. Walid Shahin, Director, NERC	Grayson Hefner, Ghassan Nazi, Dilip Limaye,	<ul style="list-style-type: none"> ▪ NERC does not have information about how the 50 toe threshold was set for mandatory energy audit program. ▪ NERC conducts energy audits and helps in regulating the market costs for audits. 	<ul style="list-style-type: none"> ▪ Request to be sent for the supply of SEC data of industries. ▪ Request to be sent for supply of a sample energy audit report of any large or medium industry consumer.

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
			Sommaï & Sanjay Dube	<ul style="list-style-type: none"> NERC claims to have the best equipments for conducting the audits and they can conduct the audits of utility systems at large industries, but not the production process audit. They have the qualified teams of engineers in NERC and claimed to have the capacity to deliver about 50 energy audits per year. NERC informed that the consumers in Jordan are going after the installation of Solar PV in place of implementation of EE measures. The net metering is one of the incentives for installing solar. But net metering is not benefiting the small consumers. Also the grid is no more supportive for the injection of renewables. NERC suggested setting up of Specific Energy Consumption (SEC) for large industries in Jordan. There are 12 large industries in the country. The large industry can comply with the By-law through achieving the targets based upon their SEC's. NERC suggested focusing more on medium size industries for better results. But setting up of different thresholds (above 50 toe) is important. For medium size industry, innovative financing mechanism should be introduced in the market. For small industries, the MEMR should provide the financial support to conduct and implement the EE measures. 	

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
				<ul style="list-style-type: none"> ▪ NERC can play the role of Quality Assurance and Quality Control (QA/QC) agency to support the implementation of Mandatory Audit Program. ▪ NERC mentioned that they have the SEC data of some of the industries. They can supply the data on request (without disclosing the client). ▪ NERC also promised to share one of their energy audit reports. 	
20-Jul-16	11.00 am Wednesday	Prof. Mohammad H. F. Dado, CEO, Prof. Ahmed Al-Ghandoor, Partner & Ismael Al-Hinti, Partner, ETA MAX	Ghassan Nazi, Dilip Limaye, Sommai & Sanjay Dube	<ul style="list-style-type: none"> ▪ ETA Max works as Energy Service Provider (ESP) in Jordan, Saudi Arabia and Qatar. ▪ Their work includes energy audits and energy management. ▪ ETA MAX also installs Solar PV for different categories of consumers in Jordan. ▪ ETA Max informed that consumers can spend JD 200,000 for Solar PV but are not ready to spend JD 20,000 for energy audits as there is no asset created out of the audit. RE financing in Jordan is also easier than EE financing for the same asset/collateral reasons. ▪ ETA Max believes that the industry should be the main target for the mandatory energy audit program. The buildings are not the best consumers as they are subject to high electricity tariff and already install EE equipment, appliances and lighting products. ▪ ETA Max explained that most large size ESP's in Jordan cannot conduct more than 20 audits a year. 	<ul style="list-style-type: none"> ▪ None

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
				<ul style="list-style-type: none"> EE equipment suppliers in Jordan are not very active in promoting EE to end-users. ETA Max has its own energy auditor certification program. ETA max also believes that the 50 toe threshold is very low and this should be redesigned. 	
20-Jul-16	2.00 pm Wednesday	Eng. Hasan Suboh, General Manager, Eco SOL	Majd Suleiman, Narneem, Dilip Limaye, Sommai & Sanjay Dube	<ul style="list-style-type: none"> Eco-Sol informed that there are not many qualified energy auditors in Jordan to handle the energy audits in medium and large industries. Eco-Sol believes that the program should be an Energy Management Program in place of Mandatory Energy Audit Program. They believe that due to subsidized electricity tariffs, energy management becomes more important for minimizing on the wastages. ECO-Sol informed that energy tariffs are low in Saudi Arabia and the water tariffs are low in Egypt. Thus many industries have shifted their base to these countries. This is a contradictory statement as on the other hand they mentioned about subsidized electricity tariffs in Jordan. 	<ul style="list-style-type: none"> They may be reached out, for the data on the costs for Solar PV installation, its usage and maintenance.
21-Jul-16	10.00 am Thursday	Mr. Nimer Hashem, In-Charge, Energy & Economy Cell, Department of Statistics, Ministry of Planning	Ghassan Nazi, Sommai & Sanjay Dube	<ul style="list-style-type: none"> The Department of Statistics (DOS) uses questionnaires to conduct the surveys for the collection of data from the consumers. It is not clear how the survey activities are planned. The DOS directly reports to the Minister of Planning in Jordan. The DOS collects data for economic purposes and also to produce 	<ul style="list-style-type: none"> DOS provided the hard copies of 2013 data on number of employees in different types of industries in Jordan.

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
				<p>reports for the Ministries. Economic activities are categorized in accordance with the International Standard Industrial Classification (ISIC).</p> <ul style="list-style-type: none"> ▪ DOS has no connection with the IT Department or Statistics Department at MEMR. Thus there is no exchange of any information between them. ▪ DOS shared the hard copies of data on size of various industries in Jordan on the basis of number of employees. ▪ If requested by the Ministry or the Project, they can collect the data for energy consumption during their next survey in 2017. ▪ DOS believes that they can be more effective in collection of data from different consumers due to their status and legal mandate. 	
21-Jul-16	11.45 am Thursday	Abdel-Motaleb Al-Nugrush, Director, Statistics & Information Unit, MEMR	Ghassan Nazi, Dilip Limaye, Sommai & Sanjay Dube	<ul style="list-style-type: none"> ▪ There are separate units at Department of Statistics and Information for electricity and oil & petroleum product data. ▪ Mr. Abdel-Motaleb's unit collects and compiles only electricity related data. ▪ The unit conducts periodic (2-3 years) survey for the collection of data. ▪ They conduct economic surveys. However, classifications do not follow ISIC as adopted by DOS. ▪ They have commercial and service sector data for the year 2014. The industry sector data will be collected next year. 	<ul style="list-style-type: none"> ▪ Provided 2014 data on commercial consumers in Jordan. The data is in Arabic and needs to be translated. ▪ Data in Arabic on the department's website will be reviewed and additional requests will be made to the unit as necessary.

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
				<ul style="list-style-type: none"> ▪ The surveys in the past were funded by EU programs in Jordan. Now the MEMR should fund. ▪ Currently, there is no linkage between the survey data and the MEMR EIS. 	
25-Jul-16	9.00 am Monday	Eng. Wijdan Al Rabadi, Commissioner, Energy & Minerals Regulatory Commission (EMRC)	Grayson Hefner, Dilip Limaye, Sommai & Sanjay Dube	<ul style="list-style-type: none"> ▪ EMRC informed that the electricity consumption data for large and other consumers of all the three utilities is available with Mr. Mohammed Al-Rousan of EMRC. ▪ EMRC suggested meeting the Director, Planning at MEMR for more detailed data. 	<ul style="list-style-type: none"> ▪ Request to go to Mr. Mohammed Al-Rousan, EMRC for the data. ▪ Meeting to be organized with Director, Planning, MEMR.
26-Jul-16	11.00 am Tuesday	Sabri S. Al Khassib, Director of Economic Policies & Studies, Amman Chamber of Commerce	Ghassan Nazi, Sommai & Sanjay Dube	<ul style="list-style-type: none"> ▪ Amman Chamber has 5000 members. All commercial and service sector companies are required to be the members. The hotels, malls, banks, hospitals and other commercial establishments are the members. ▪ The 50,000 members are divided in 9 categories based upon their class and the size of capital. ▪ The businesses with more than 10 million JD are categorized as large, between 5-10 million JD are categorized as medium and below 5 million JD are categorized as small. The small category is further divided in 6 other categories including even the smallest business with 1000 JD as capital. ▪ ESPs are also the members and they fall under Consulting Agency category. ▪ The Chamber echoed the fear of members about additional financial 	<ul style="list-style-type: none"> ▪ The Chamber should be kept in the loop for the upcoming stakeholder workshop. The concept, plan, agenda and timeline should be shared with them in advance to mobilize their support.

Date	Time & Day	Person & Agency	Attendees	Notes	Actions Required
				<p>burden due to mandatory energy audits.</p> <ul style="list-style-type: none"> ▪ The main issue is about the communication between the Ministry and the consumers. The details about the Bylaw 73 have not been communicated properly to the consumers. ▪ Chamber is keen on participating at the proposed stakeholder workshop by ESCB in October/November. ▪ Chamber also provided the details about their members and the categories. 	

Bylaw No. (73) For year 2012

The Bylaw on Regulating Procedures and Means of Conserving Energy and Improving Its Efficiency

Issued by virtue of Article (18) of the Renewable Energy and Energy Efficiency Law No. (13) for year 2012

Article (1) This Bylaw is named (The Bylaw on Regulating Procedures and Means of Conserving Energy and Improving Its Efficiency) and shall come into effect after thirty (30) days of publishing it in the official gazette.

Article (2) The following words and phrases wherever they occur herein shall have the meanings designated thereto below, unless the context requires otherwise:

Ministry	: The Ministry of Energy & Mineral Resources.
Minister	: The Minister of Energy & Mineral Resources.
Institution	: The Jordan Institution for Standards & Metrology (JISM).
Energy Conservation	: The set of procedures and means undertaken in order to reduce consumption of energy and improve efficiency of its use without affecting the level of performance.
Energy Efficiency	: The process that involves using less amount of energy while having the same product or service.
Energy Efficiency label	: The label issued by the institution fixed on electronic appliances to describe its efficiency in consuming energy.
Consumer	: An individual consuming over (50 TOE) of energy annually, as well as ministries, official departments, official public institutions, and public corporations whatever the amount of its consumption.
Energy Audit	: A study of energy consumption types in all forms, that detects areas of wasting energy and inefficient use of it, and establishing financially feasible technical solutions for reducing consumption of energy and improving efficiency of its use.

Article (3) For purposes of conserving energy and improving efficiency of its use, the Ministry; in cooperation and coordination with competent parties, is working on the following:

- a. Set the general policy of energy conservation and improvement of its efficiency, and submit it to the cabinet for endorsement and enact the plans and programs necessary for its implementation.
- b. Encourage investment in the field of conserving energy and improving efficiency of its use.
- c. Monitoring energy audit procedures and implementation of systems and activities related to conservation of energy and improving efficiency of its use.
- d. Submit to the Cabinet about dates of summer and winter daylight saving time.
- e. Take the necessary measures for the implementing an emergency plan to reduce energy consumption.
- f. Spread national awareness in the field of conservation of energy and improvement of its efficiency.
- g. Opine on energy-consuming projects.
- h. Establish a database related to conservation of energy and improvement of its efficiency.

Article (4)

- a. The consumer shall comply with policies and procedures of conserving energy and improving its efficiency as specified under the directives issued for such a purpose, including compliance with the building codes for energy saving.
- b.
 1. The consumer shall submit an application to the Ministry to obtain a certificate indicating compliance thereby with the policies and procedures as stipulated in paragraph (a) above.
 2. The Ministry shall issue the above mentioned certificate within two months of the applicant's fulfillment of all required conditions.
- c. The consumer shall adapt his conditions according to this Bylaw within a period not exceeding three years from the effectiveness thereof.

Article (5)

- a) The consumer shall be subject to the mandatory and periodic energy audit carried out by the licensed entities pursuant to provisions herein, while basis and conditions of such an audit shall be determined by virtue of certain directions to be issued for such a purpose.

- b) The consumer shall be obliged to furnish the Ministry with the energy audit report.

Article (6) It is impermissible for anyone to provide energy audit services unless the same is licensed by the Ministry to do so. In this context, conditions and procedures of the licensing shall be determined by virtue of certain directions to be issued to this end.

Article (7)

- a) The Ministry, in cooperation with the Institution, shall set a schedule containing equipments, tools, and supplies required to have the energy efficiency label, as per the specifications and the technical rules related thereto.
- b) It is impermissible to import or manufacture equipments, tools, and supplies of low efficiency which the Ministry determines in cooperation with the Institution and the competent parties.
- c) 1- Excluded from provision of section (b) herein above the equipments, tools, and supplies that are traded or present in the market or goods that were under import prior to effectiveness of this bylaw.

2- Cases where goods are deemed to be under import shall be determined according to directions to be issued by the Ministry in coordination with the Customs Department.

Article (8) Any party importing or manufacturing the equipments, tools, and supplies as indicated in Article (7) herein shall be obliged to conduct the following:

- a) Initiate a database including the technical information and the documentations granted thereto by the Ministry and the Institution, which are necessary to verify the validity and accuracy of the energy efficiency label's contents, and maintain such information for a period not less than five (5) years after importing or manufacturing any of these equipments, tools, or supplies.
- b) To fix the energy efficiency label in a clear and notable manner on equipments, tools, or supplies.

Article (9)

- a) Multi-purpose electricity meters shall be endorsed for measuring energy consumption and time of the same for purposes of introducing day and night tariffs as well as peak tariffs, according to the directions to be issued by the Electricity Regulatory Commission (ERC) to this end.
- b) Retail suppliers licensed by (ERC) shall be obliged to replace single-purpose electricity meters with multiple-purpose electricity meters within a period not exceeding seven (7) years from the date of this Act's effectiveness.

Article (10)

- a) No work permit shall be granted until after submitting a proof of installation of a Solar Water Heater (SWH) for any of the following, subject to abundant of the technical conditions allowing the same, according to the inspection conducted by the competent official authorities:
- 1- Buildings exceeding (250) square meters in area.
 - 2- Apartments exceeding (150) square meters in area.
 - 3- Offices exceeding (100) square meters in area in commercial buildings.
- b) Provisions of section (a) of this article shall come into force as of 1/4/2013.

Article (11)

- a) Ministries and official department, in cooperation with the Ministry, may introduce tenders or attract competitive biddings pursuant to accredited legislations for implementing projects of conserving energy and improving its efficiency in sites and projects thereof.
- b) 1- Any individual may submit a direct offer to Ministries and official departments for implementation of projects on energy efficiency at sites and projects of such parties for the purpose of conserving energy and improving its efficiency.
- 2- Direct offers indicated in item (1) above require the bidder to attach a financial and technical feasibility study of the submitted proposal, and to prove previous experiences in performing similar services and to submit any additional data or documents as may be necessary to study the proposal.
- 3- The party to which the direct offer was submitted shall undertake the study of the offer in cooperation with the Ministry, provided that such party shall notify the bidder of its decision within six months from the date of submission.
- 4- In case of initial approval of the submitted direct offer, the party to which the offer was submitted, in cooperation with the concerned party, shall negotiate with the accepted bidder; prelude to the signing agreement of projects on conserving energy and improving its efficiency.
- 5- The procedures of accepting direct bids, studying, and evaluating the same will be determined as per the directions to be issued to this end.

Article (12) Pursuant to provisions herein, an award namely (Energy Efficiency Award) shall be conferred in order to encourage consumers to conserve energy and improve efficiency of its use. Basis of conferring this award and its conditions shall be determined pursuant to directions to be issued for such a purpose.

Article (13) The minister shall issue the directions necessary for implementing provisions herein.

27/9/2012

His Majesty King Abdullah II Son of Al-Hussein

Prime Minister & Minister of Defense Fayez Al-Tarawneh	Minister of Awqaf and Islamic Affairs Dr. Abdul-Salam Al-Abbadi	Minister of Finance & Minister of Industry & Trade in Proxy Sulaiman Hafith	Minister of Parliamentary Affairs Sharary Kassab Al-Shakhanbeh
Minister of Energy & Mineral Resources Alaa' Al-Bataineh	Minister of Interior Ghaleb Al-Zubi	Minister of Planning & International Cooperation Dr. Ja'far Hassan	Minister of Water and Irrigation Eng. Mohammad Al-Najjar
Minister of Higher Education & Scientific Research Dr. Wajeih Owais	Minister of Housing & Public Works Eng. Yahya Al-Kasbi	Minister of Communication and Information Technology Dr. Atef Al-Tall	Minister of Social Development Wajeih Azaizeh
Minister of Health Abdullateef Wraikat	Minister of Culture Dr. Salah Jarrar	Minister of Environment Yaseen Al-Khayyat	Minister of Developing Public Sector in proxy Dr. Khlaif Al-Khawaldeh
Minister of Tourism and Antiquities & Foreign Affairs in proxy Hafid Hmaid Al-Fayez	Minister of Agriculture Ahmad Al Khattab	Minister of Municipal Affairs Eng. Maher Abu Al-Samen	Minister of Justice Khalefah Khaled Al-Sulaiman
Minister of Education Fayez Mohammad Al-Saudi	Minister of State of the Prime Ministry Affairs & Legislation Dr. Kamel Hamed Al-Sa'eed	Minister of Political Development Dr. Nofan Al-Aqeel Al- Ajarmeh	Minister of Transport Dr. Hashem Al-Masa'eed
Minister of State for Media & Communication Affairs Sameeh Al-Ma'aitah		Minister of State Yusef Kaseb Al-Jazi	Minister of State for Women Affairs Nadia Mohammad Hashem

USAID Jordan Energy Sector Capacity Building Activity
Saqra Building # 238(C), 6th Floor
Arar Street
Amman, Jordan