الجَمعيّـة العِلميّـة المَلكيّـة
Royal Scientific Society
National Energy Research Centre

National Energy Research Centre

Providing a range of specialised services, from solar thermal energy, photovoltaic and geothermal, to wind energy, bio-energy and energy efficiency to Jordan and the region

2021 Profile

Table of Contents

The Royal Scientific Society

Born out of the great hearts and spirit of His Majesty the Late King Hussein and HRH Prince Hassan in 1970, the Royal Scientific Society (RSS) aims to be the knowledge leader for science and technology locally and regionally. The RSS uses excellent scientific and engineering research to power economic development and social progress.

HRH Princess Sumaya bint El Hassan serves as the President of the Royal Scientific Society and is greatly recognized for her work in promoting various scientific endeavours on a local, regional and international level.

RSS is the largest applied research institution, consultancy, and technical support service provider in Jordan, and is a regional leader in the fields of science and technology.

RSS provides expert testing services via 38 specialized locally and internationally accredited laboratories and prides itself on offering both the public and private sectors a unique scientific resource and a wide range of project expertise.

Supported by more than 500 scientists, researchers, technical support staff, highly skilled management and faculty, the RSS has always been recognized as a local, regional and international research and development hub.

RSS proactively guides, supports and strengthens large governmental research projects and commercial incubators for both small and medium enterprises. Industrial firms contract RSS to assess potential impacts on the environment and to recommend practical solutions to minimize and control pollutants. RSS conducts standardized laboratory inspections on many food items consumed daily by Jordanians.

The National Energy Research Centre

Secure Energy, Empower Lives, Brighten the Future

The establishment of the centre goes back to the beginning of the work of the Royal Scientific Society, where the Department of Solar Energy was established in 1972, which developed into the National Energy Research Centre. The centre was founded to conduct applied research, technical studies and to advance development in the field of Renewable energy, such as wind energy, solar energy, bio-energy, etc., in addition to raising the efficiency of energy use and management, which collectively lead to reducing energy costs for the national economy, protecting the environment and reducing pollution. The centre aims to achieve the following:

- Exploit local sources of renewable energy, including wind energy, solar energy, bio-energy and geothermal energy, using modern technologies that are appropriate for local conditions.
- Cooperate with relevant government agencies to develop means, guidelines and incentives to improve energy efficiency.
- Develop the necessary local and scientific capabilities and expertise to exploit renewable energy sources.
- Provide information for solar radiation and wind characteristics, and identify and evaluate promising areas for wind and solar farms.
- Cooperate with local, regional and international institutions to conduct applied scientific research and spread the concept of energy, water and food nexus.
- Developing renewable energy and energy efficiency policies, and the necessary infrastructure to support the implementation of investment projects and implementing pilot projects within Jordan and the region through partnerships.
- Provide technical services, consultation, and supervision for the implementation of relevant projects, preparing technical and economic feasibility studies and financial models for clean technology investments.

The work focused initially on implementing pilot projects in various regions of the Kingdom for the benefit of local communities, such as the electrification of the first village in the region entirely using renewable energy project in 1987, where the village of Jurf Al-Darawish in southern Jordan was provided with electricity using a hybrid system of solar and wind energy. On the other hand, the centre has been involved in providing remote communities with renewable energy, such as the water pumping project at the Bir al-Omari site that works with solar energy and the al-Jafr well on the eastern border of the Kingdom, and the installation of solar PV systems for both the village of Qurayqara and al-Risha in Wadi Araba, in addition to several solar PV systems at other villages and service centres.

In addition, many mechanical wind turbines were manufactured and installed in remote areas to pump water from desert wells and provide residents of these areas with their water needs in cooperation with the Water Authority.

With regards to the services provided to third parties, NERC carries out techno economic feasibility studies, building energy design studies, energy audits, monitoring and measurements, performance measurements and certification of buildings & products, Measurements & Verification (M&V), and laboratory testing of the air conditioners, clothes washers, refrigerators, photovoltaic system, solar thermal system and lighting.

In addition, NERC was heavily involved in the development of the technical documents related to energy labelling and minimum performance and has assisted the public and private sectors in bridging the gap between them to ensure a smooth transition towards energy labelling and minimum performance parameters for home appliances.

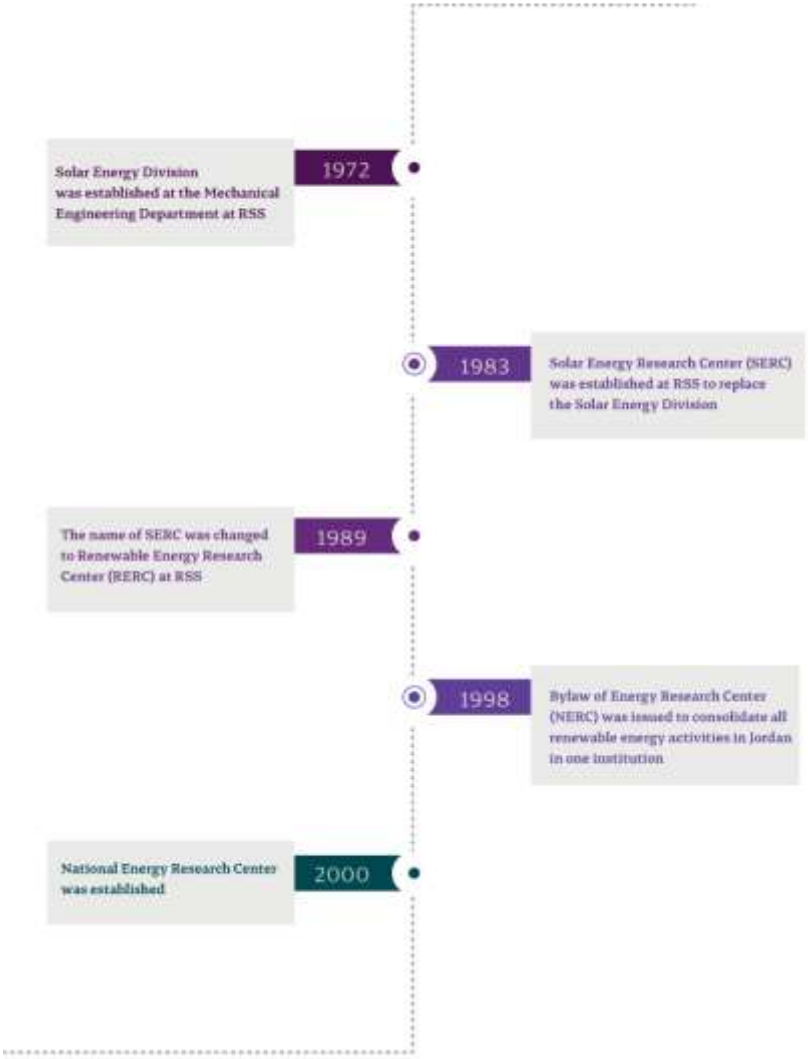
Among the broader public sector clients are the European Commission (EC), the World Bank (WB), the European Bank for Reconstruction and Development (EBRD), the United Nations Development Program (UNDP), the European Investment Bank (EIB), the German Bank for Reconstruction (KfW), Ministry of Energy and Mineral resources and many others.

During the past 25 years, NERC has successfully completed many assignments in the field of energy efficiency and renewable energy in Jordan.

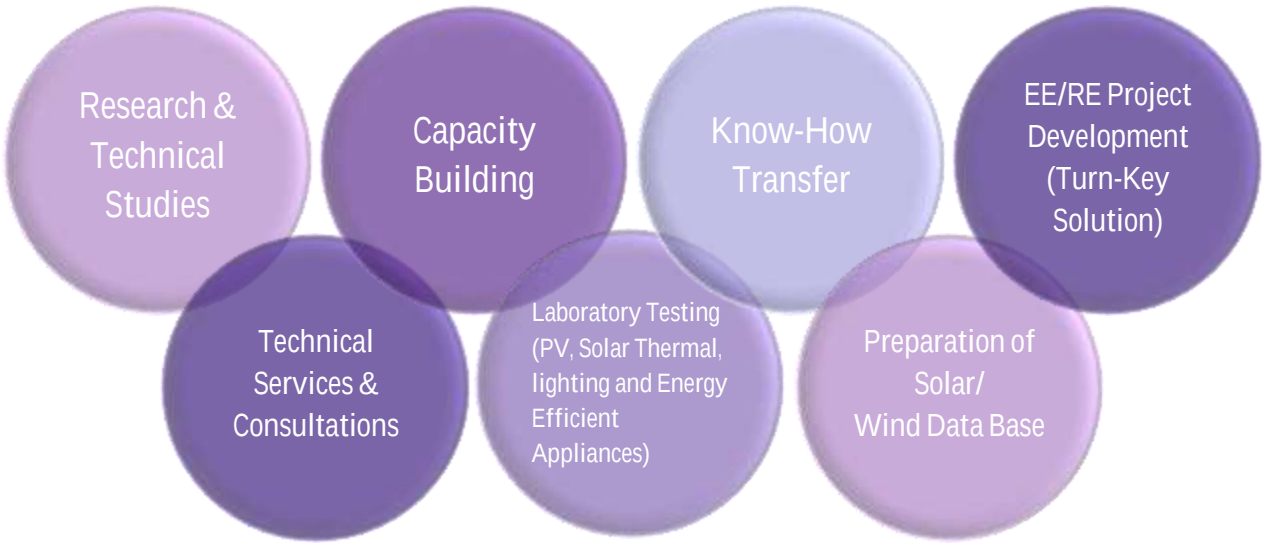
Our Objectives

- Ensuring energy efficiency conditions in the relevant sectors (industry, buildings are achieved
- Supporting the relevant market key actors as energy consumers in reducing overall energy consumptions
- Promote the utilisation of renewable energy in Jordan

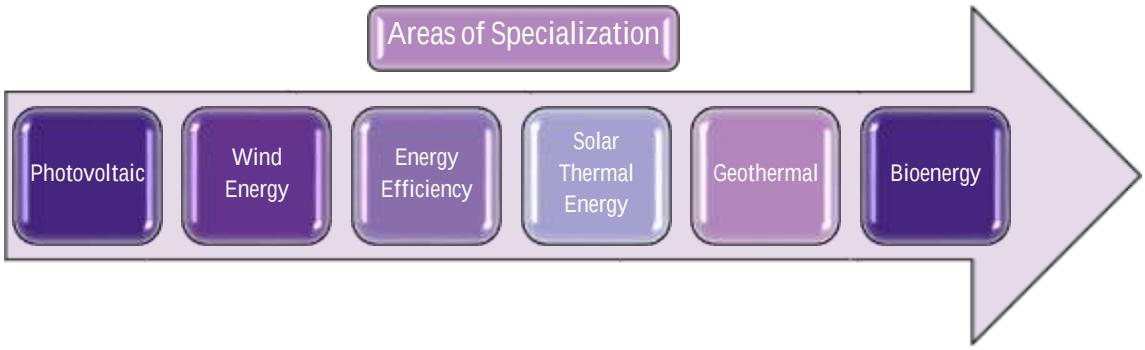
Our History



Our Services



Our Work



Energy Efficiency & Solar Thermal Division

"Energy efficiency is a measure of energy used for delivering a given service. Improving energy efficiency means getting more from the energy that we use."

Activities & Services

Energy conservation and improving energy efficiency is the key tool and mean for reducing the growing demand for energy and easing its economic burdens. It can be characterized by its easiness, speedy and lower implementation cost when compared to establishing new conventional power plants.

The National Energy Research Centre provides various services in the field of energy conservation and the implementing projects related to energy efficiency and solar thermal energy.

The National Energy Research Centre works on the development of domestic solar water heaters according to the criteria that guarantees low cost of unit, ease of installation and maintenance and the utilization of materials normally available in the country

NERC conducts research & development and demonstration projects, providing technical consultations in the field of solar energy. It also aims at developing the appropriate equipment and systems for application in Jordan and know-how transfer of solar energy applications. In the field of Energy Efficiency, NERC carries out the following

- Conduct energy audit studies for all sectors
- Implementation and Supervision of energy efficiency projects
- Provide measurements and verifications services related to energy efficiency projects (M&V)
- Carry out specialized energy efficiency training courses.
- Provide services to investors from the private sector, companies and local authorities as a third party with regard to exploiting the technical and economic capabilities to implement energy efficiency measures.
- Carry out Energy labelling tests for household appliances and solar water heater systems.
- Participation in different Gov. Committees (EE/MEMR, Climate Change TWG/MoEnv, JSMO.
- Participation in the preparation of the National communication Reports for GHG inventory and Mitigation.
- Provide specialized training courses and capacity building on issues related to energy efficiency. NERC also offers certified training on RetSCreen software for Monitoring and Verification (M&V) of EE&RE projects in cooperation with the Canadian Institute for Energy training.

NERC's main field of expertise in the field of solar thermal energy extends to:

- Solar space heating and cooling
- Passive solar application
- Solar cookers
- Drying crops
- Heating of outdoor and indoor swimming pools
- Electric power generation by using CSP
- Solar desalination of seawater & brackish water
- Water heating for domestic, commercial and industrial applications

The following topics are covered in the solar thermal training provided by NERC:

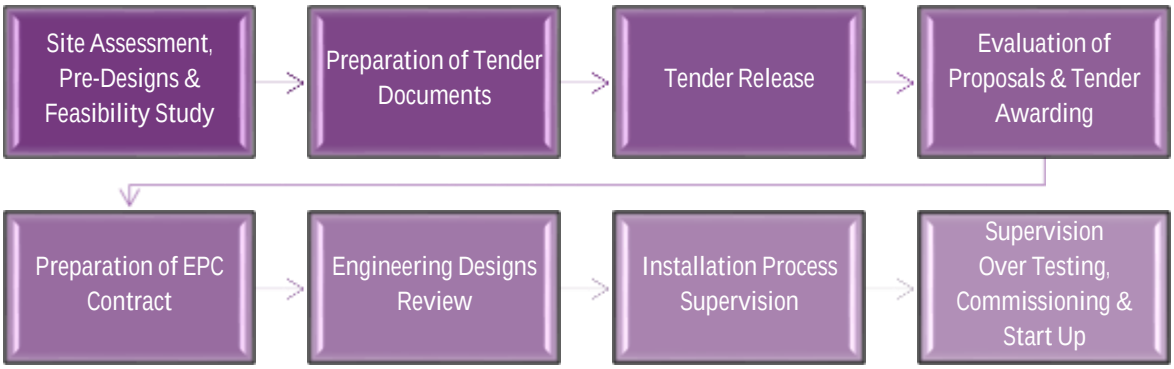
- SWHS optimal design
- Solar component loops & connections
- Solar system applications: case study
- Solar collector marketing
- Collector performance
- Solar cooling system

Instruments & Equipment

- Electronic Balance PRECISA 60000 GM SCS
- Testo 400 Multi-Functional Measurement
- Testo 177-T4 (4 Channel External Thermocouple Data Logger)
- Infrared Thermometer with Laser Sighting
- Analog Ultrasonic Detection System
- Testo 475 Non-Contact Measurement of RPM and Oscillation
- Testo 845 Adjustable Focus Infrared Thermometer
- Panametrics Transport Pt868 Water Flow Meter
- Lighting Lux-Meter
- FLUKE 43B Power Quality Analyser
- Flue Gas Analyser
- Multi-function Data Logger
- Analyst 2000P AC/DC Power Meter
- VIP System 3 – Digital Energy Analyser
- Fluke Power Analyser
- Solar Pathfinder Instrument
- Thermal Imager

Photovoltaics Division

Activities & Services



The PV Division was established in 1985, with the following areas of function:

- A-Z projects development (Turn-key solutions)
- Development of techno-economic feasibility studies and financial models for
- Clean-tech investments
- Carries out measurements and verifications as well as performance monitoring services
- Technical services and consultations
- Laboratory testing of photovoltaic solar cells and system components, PV modules and inverters performance
- Design and installation of photovoltaic solar systems for different applications like water pumping, water desalination, rural electrification and grid-connected systems
- Maintenance of photovoltaic solar systems
- Solar radiation measurement, technical and technological cooperation with local and international institutions
- Conduct training courses, seminars and workshops to enhance and develop local skills in the field of PV applications

PV training courses' topics are:

- Photovoltaic basics & technologies
- Solar radiation basics
- PV system components
- Off-Grid and On-Grid Systems

- Design and Sizing of PV Systems
- Introduction to Economics of PV Systems
- Presentation of NERC's PV

PV Instruments and Equipment

- Power Quality Analyzer
- Power Quality Circuitor
- Ultrasonic Liquid Flowmeter
- Fluke Laser Distance Meter
- Emissometer Devices & Services
- Scaling Digital Voltmeter
- Thermal Imager Mains Unit
- IR Thermometer
- Temperature, RH & Air Velocity
- Quad Temperature Converter Pico
- Fluke Flexible
- Ultrasonic Leak Detector and Leakage Tester Armaturen ArImetec-S
- Thermometer – Rough Deployment in Industry and Trade
- Flue Gas Analyzer
- Speed and Temperature Meter
- Thermometer – for Long-Term Monitoring
- PH Conductivity

Wind Division

Activities & Services

In this field, NERC provides the following:

- Wind potential assessment studies
- Technical services and consultations
- Site evaluation and feasibility
- Support throughout project development
- Implement demonstration projects
- Wind Farm technical support services
- Wind data measurements and analysis
- Installation and maintenance of wind measurement masts and weather stations
- Wind energy know-how transfer to relevant institutions and private companies in Jordan and the region
- Conduct training courses, seminars and workshops to enhance and develop local skills in the field of wind applications

Preparation of Wind Data Base

NERC is currently conducting a wind measuring campaign in the promising sites in Jordan as a first stage based on the availability of wind measuring systems at different heights (10, 30, 40, 50, 60, and 70) meter above ground level (a.g.l). The gathered data is processed and evaluated using different software. One of the main software used in data analysis is Wind Rose.

Training

- Wind turbine technology
- Wind applications
- Wind energy assessments
- Wind farm design & economics

Wind Instruments & Equipment

- Wind Sensors: Depending on the type of sensor, it converts wind speed, wind direction, temperature and/or solar radiation to electrical signals.
- Masts: The function of the mast is to carry and fix the sensors to the desired height. Wind Department has two different types of masts: tubular & Lattice (see pictures) with different heights ranging from 10 m up to 71 m.
- Data Loggers: The data logger is used to process the electrical signals received from different sensors for pre-defined time periods and record them as time series for retrieval at a later time.

Bio Energy Division

Activities & Services

National Energy Research Centre has a multi-disciplinary operation encompassing a wide range of scientific, engineering and energy skills that focus both on applied and fundamental research in the field of new and renewable energy sources as well as on energy conservation. In this essence, National Energy Research Centre's role is to act as a bridge between academia and the energy industry through 16 energy experts, two environmentalists, three economists, thus enabling coherency of research, design, testing and promotion of energy related topics.

In the bio energy field, NERC provides the following:

- Bio-energy technology & know-how transfer
- Capacity building and awareness by training and information dissemination
- Provide technical data for establishing small biogas digesters for agricultural and rural areas
- Bio-energy project implementation and management

National Energy Research Centre is taking the role of research and development activities related to resource assessment like biomass potential, Biomass RTD, and chemical analysis.

Assessing available technologies including organic waste to energy, biomass boilers and stoves for domestic heating, gasification, palletizing machinery and pellet boilers.

National Energy Research Centre is equipped with all necessary instruments in order to analyse the fuel properties, like:

- Elemental analysis (C, H, O, N, S)
- Proximate analysis (volatile, ash, fixed carbon)
- Analysis on nitrogen content
- Sugar content with spectrophotometer
- Calorific value (gross, net)

Instruments & Equipment

- Thermometer
  Portable thermometer used to test the different in the temperature between two points
- Portable Biogas Analyser
  Portable Biogas Analyzer used for analysing the biogas content. It shows the concentration of Methane (CH4), Carbon Dioxide (CO2), Oxygen (O2), Hydrogen (H2) and Hydrogen Sulfide (H2S) at the biogas.

NERC Strategic Partners

Global Environment Facility

Government of Jordan

European Union (EU)

World Bank (WB)

Mediterranean Association of National Agencies for Energy Management (MEDENER)

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Government of Germany

Swedish International Development Cooperation Agency (SIDA)

European Bank for Reconstruction and Development (EBRD)

German International Cooperation Agency (GIZ)

European Investment Bank (EIB)

German Bank for Reconstruction (KfW)

French Development Agency

Japan International Cooperation Agency

International Union for Conservation of Nature

United States Agency for International Development

United Nations Development Programme

Awards

RSS/NERC Receives 2019 Energy Globe Award for Solar Project

NERC has won the "Energy Globe Award", the Global Sustainability Award, for the "Solar Water Pumping in the Jordan Valley and Highlands" project.

NERC Project wins the 2016 Energy Global National Award for the best environmental project in Jordan

A recycling system that converts animal manure into energy and heat sources has been awarded the 2016 Energy Global National Award for the best environmental project in Jordan.

RSS Wins Two Prizes from Al Hussein Fund

The Royal Scientific Society won two awards from Al Hussein Fund for Innovation and Excellence for 2016.

Memberships

The Mediterranean Association of National Agencies for Energy Management (MEDENER) brings together agencies in the Mediterranean region in charge of energy efficiency and the promotion of renewable energy sources, two key conditions for the success of the energy transition.

The International Institute for Applied Systems Analysis (IIASA) is an independent, international research institute with National Member Organizations in Africa, the Americas, Asia, and Europe.

World Association of Industrial and Technological Research Organizations is the largest global network of research and technology organizations (RTOs) that enables transformation for a sustainable future. It provides a wide range of services and programs to foster R&D capacities and facilitate the transfer of technology around the globe.

The International Union for the Conservation of Nature is a member-based organization and its Members form the highest decision-making body of the Union, through the IUCN World Conservation Congress taking place every four years. IUCN counts over 1,400 Members from over 170 countries.

Energy Laboratories

The Energy Labelling Laboratory was established in response to the issuance of Energy Label Technical Rules and Eco-design regulations for household appliances by Jordan Standards and Metrology Organization (JSMO).

Energy Labelling Laboratories

Lighting Testing Laboratory

Photovoltaic System Testing Laboratory

Solar Thermal Laboratory

The Energy Labelling Laboratory is accredited according to Jordan Accreditation System, and adheres to Jordan Institution for Standards and Metrology specifications that ensures testing of the household appliances is according to Jordanian standards.

The Energy Labelling Laboratory consists of three laboratories:

Washing Machines Laboratory

The purpose of this lab is to evaluate the energy efficiency level of washing machines in accordance with EU-Standard EN 60456 and Jordanian Technical Regulation 2104:2013 as well as SASO, so it would WM performance characteristics that represented in energy

labelling and eco-design requirements: EEI, AEc, AWc, Rinsing performance, RMC, Spin Speed.

Air Conditioners Laboratory

The purpose of this lab is to evaluate the needed parameters for energy efficiency label of air conditioners according to EUROPEAN STANDARD: EN 14511 & EN 14825, and Jordanian Technical Regulation 2108:2013 about Energy labelling of air conditioners, so it can measure the following parameters: EER, COP, SCOP, SEER.

The steady state heating or cooling capacities determined using the calorimeter method shall be determined with a maximum uncertainty of 5 %.

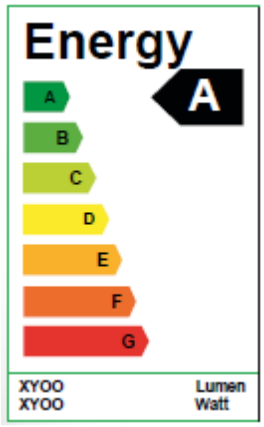
Refrigerating Appliances Test Laboratory

The purpose of this lab is to measure the energy consumption of refrigerating appliances under specified test condition. Through condition test according to standard (BS EN 62552) and Jordanian Technical Regulation 2101:2013, so it can measure the following parameters: energy consumption, testing storage temperature, Energy Efficiency Class (EEI).

Lighting Testing Laboratory

First accredited lab in Jordan for testing energy efficiency class for lamps

The lab is accredited according to Jordanian Technical Regulation 2092: Energy efficiency labelling of household electric lamps.



The lab is capable of testing and verifying energy efficiency class of lamps by measuring luminous flux and input power parameters. The energy efficiency of the lamp is rated in terms of a set of energy efficiency classes from A to G on the label; A being the most energy efficient, and G the least efficient.

The lab is capable of testing the following lamp types:

- Double capped fluorescent lamps
- Single capped fluorescent lamps
- Tungsten halogen lamps
- Tungsten filament lamps
- Self-ballasted LED lamps
- Self-ballasted lamps

The lighting testing lab performs tests on lamps according to the following standards:

- JS EN 60081: Double-capped fluorescent lamps – performance specifications
- JS EN 60901: Single-capped fluorescent lamps – performance specifications
- JS IEC 60969: Self-ballasted lamps for general lighting services – performance requirements
- IEC 60064: Tungsten filament lamps for domestic and similar general lighting purposes – performance requirements
- IEC 60357: Tungsten halogen lamps (non-vehicle) – performance specifications
- IEC 62612: Self-ballasted LED lamps for general lighting services with supply voltages > 50 V – performance requirements
- CIE 84: Measurement of Luminous Flux
- CIE 127: Measurement of LEDs
- CIE S 025: Test Method for LED lamps, LED luminaires and LED modules
- CIE 121: The Photometry and Goniophotometry of Luminaires
- JS 2092: Energy efficiency labelling of household electric lamps

Photovoltaic System Testing Laboratory

Photovoltaic Laboratory, which was funded by the European Union, is the first laboratory of its type to provide tests and assessments on Photovoltaic modules in Jordan. The laboratory is ISO17025 accredited by the Jordan Accreditation Unit/ JSMO.

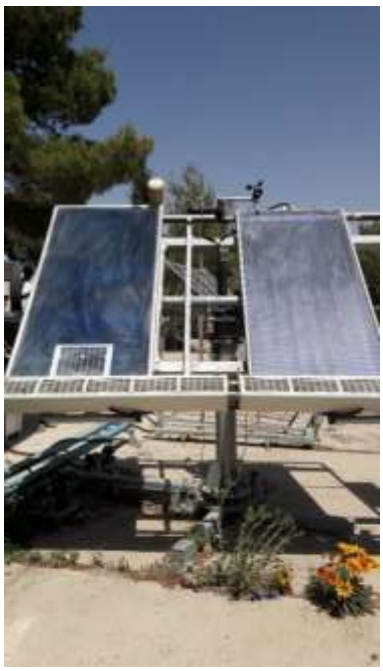
Instruments & Equipment

- LED Sun Simulator
- LED Sun Simulator Output
- Electroluminescence Tester (EL Test)
- EL Test Output
- Solar PV Simulator
- Utility Grid Simulator
- Solar Installation Test Kit
- Solar Patch Finder
- High Voltage
- Infrared Camera
- DC & AC Power Analyser
- IV Curve Tracer

Solar Thermal Laboratory

Solar thermal lab was built in 2017. The main target of building this lab is to carry out the thermal performance of solar collectors and solar water heating system and to test the durability of solar water heater parts.





The lab is now ready for carrying out the tests according to the following internal standards:

- EN_12976-2(2006)
- ISO 9806-2013
- ISO 9459 (2 to 5)

The above mentioned test standards cover all requirements of SHAMCI quality mark for Arab countries.

NERC Projects

SOLE PROJECT "Energy efficiency for the Public Stock Buildings in Mediterranean Area."

Donor: EU

Duration: 2020–2022

The Royal Scientific Society (RSS) – National Energy Research Centre (NERC) in cooperation with ENI CBC MED are implementing the SOLE PROJECT "Energy efficiency for the Public Stock Buildings in Mediterranean Area." This project supports cost-effective and innovative energy rehabilitations of public buildings, supported by European Union, European Neighbourhood Instrument (ENI). It is jointly implemented in more than seven countries including Jordan, in which a pilot project will be implemented in Madaba, Jordan by the RSS/NERC. The project focuses on increasing the use of efficient and renewable energy-based heating and cooling systems.

ENI CBC Med BEEP Project (BIM for Energy Efficiency in the Public Sector)

Donor: EU

Duration: 2019–2022

Objective: BEEP project aims at strengthening the use of Building Information Modelling (BIM) to enhance energy efficiency in buildings. The testing of this emerging technology on built heritage will be performed to demonstrate its scalability to the entire building stock. The project will provide public administrations with a powerful method for the energy rehabilitation of public buildings to be supported with private funds through the Energy Performance Contracting.

The project main outcome will be an innovative methodology based on the integration of emerging technologies tested on heritage public buildings.

Build-ME (Phase 2)

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

Donor: German Government – German Ministry of Environment

Duration: 2020

Objective: BUILD-ME Project aims to improve the energy efficiency of buildings through the application of building codes related to improving energy efficiency in buildings and the use of high-energy efficient devices and equipment in cooperation with the consulting company NAVIGANT, Germany and funded by the German Government represented by the German Ministry of Environment.

MINARET Project

Donor: Swedish International Development Cooperation

Agency: (Sida)

Duration: 2016–2021

Objective: The MENA Region Initiative as a Model of NEXUS Approach and Renewable Energy Technologies (MINARET) aims to come out with a NEXUS model that can be applied at municipal level in the MENA region countries to find sustainable solutions to the unique water, energy and food security challenges from a local municipal level. MINARET implemented a range of pilot projects in Karak municipality in Jordan, Jdaidet el Chouf municipality in Lebanon and Monastir municipality in Tunisia.

MEDA – Jordan Valley Links Project

Donor: MENNONITE ECONOMIC DEVELOPMENT ASSOCIATES (MEDA) / Canada

Duration: 2018–2020

Objective: Jordan Valley Links – Clean Technology project aims to build the capacity of women and youth in the Jordan Valley to become clean technology entrepreneurs and freelancers. To achieve this, project activities supported women and youth to develop technical and soft skills and create market linkages in the clean technology sector. This project adopted a three-prong approach that seek to increase the economic participation of women/youth and inspire behavioural changes within the community regarding the use/adoption of clean technologies; which included the following elements: RE/EE, Agriculture, and Awareness.

Schools Solar Heating Program Green Universities Project

Donor: Princess Alia Foundation (PAF)

Duration: 2017–2019

Objective: To provide comfortable environment for learning in the schools that affected by Syrian crisis.

The National Energy Research Centre supervised the implementation of energy efficiency and renewable energy measures in 200 schools within the frame of the schools heating programs in Mafraq, Irbid and Ramtha.

SUDEP Project: Sustainable Urban Demonstration Project at Sahab Municipality

Donor: EU

Duration: 2015–2017

Objective: The main project objective is to enable Sahab Municipality in Jordan to be a pilot for the local authorities in ENPI South partner countries to address local sustainable development challenges related to energy.

SWITCHMED – MED TEST II

Donor: EU

Duration: 2015-2017

Transfer of Environmentally Sound Technology (TEST) in the South Mediterranean

Region: Jordan

MED TEST II project in Jordan has been led by the Royal Scientific Society / Water and Environment Centre (WEC) in cooperation with the National Energy Research Centre (NERC), in partnership with Amman Chamber of Industry (ACI), and was implemented under the patronage of the Ministry of Industry, Trade and Supply (MoITS) and the Ministry of Environment (MoEnv).

REEEP – RENEWABLE ENERGY AND ENERGY EFFICIENCY PROGRAM

Donor: EU

Duration: 2013–2015

Objective: The Royal scientific Society / National Energy Research Centre (RSS/NERC) implemented the Renewable Energy and Energy Efficiency Program in buildings to reduce energy consumption costs through implementing the most proper and cost-effective energy efficiency measures & renewable energy technologies.

RSS/NERC was assigned by the Ministry of Energy and Mineral Resources to execute comprehensive energy efficiency & renewable energy audits for buildings both public and private to identify the potential of energy saving opportunities and the major maintenance and design features, in addition to conducting trainings for public officers on EE & RE.

Cleaner Energy Saving Mediterranean Cities (CES-MED)

Donor: EU

Duration: 2016-2017

Objective: This project aims at supporting and strengthening the role and capacity of their local authorities to adopt and implement sustainable development policies at the local level, and this in synergy with national regulatory and legislative frameworks. The project offers direct support to these cities and municipalities in terms of technical expertise and training for the preparation of Sustainable Energy and Climate Action Plans (SECAP), which are also required to join the Covenant of Mayors.

Energy Audit – Central Bank of Jordan

Donor: Central bank of Jordan

Duration: 2013–2014

Objective: The audit main objective was to identify the overall reduction of energy use through recommended changes to systems or policies and procedures, Identify and quantify

the current and previous year utility usage and expense, identify the Energy Saving Opportunities, Address the Renewable Energy Utilization Potential.

Green Universities Project

Donor: USAID/PAP

Duration: 2013–2014

Objective: This project aims to institutionalize sustainable concepts within Jordanian universities structure and processes, encourage and empower students and staff towards making changes in their universities that will lead to environmental sustainable campuses and utilize social marketing methodology to foster sustainable behavior choices of the university community and the local people in the surrounding communities.

Residential and Street Lighting Project

Donor: AFD

Duration: 2010–2011

Objective: The project aims at reducing energy consumption and electrical demand by increasing public awareness on the advantage of using CFL's and energy efficient street lighting, which will help reduce energy cost for Jordanian citizens and slow down the demand increase for energy, in addition to protecting the environment.

Energy Labelling & Minimum Energy Performance Standards (MEPS) for Home Appliances Project

Donor: GEF/UNDP

Duration: 2010–2014

Objective: The goal of this project is to reduce greenhouse gas (GHG) emissions from the energy consumption of appliances in Jordan by achieving a market transformation towards high-efficiency products through the introduction of energy labels and minimum energy performance standards. The main objective of this project is to establish energy labelling and set Minimum Energy Performance Standards (MEPS) program for household appliances in Jordan with initial focus on air conditioners, refrigerators, freezers and washing machines.

Green Lending Project

Donor: AFD

Duration: 2013

Objective: Establishment of a benchmark and List of equipment, manufacturers, suppliers and installers for energy efficiency investments in Jordan for Solar Water Heaters (SWH) and Solar Panels (PV).

Photovoltaics Projects

NERC conducted full consultancy services [engineering feasibility study, preparation of tender documents, offers' evaluation, EPC contract preparation, construction supervision (installation process supervision), testing and commissioning] for:

4.4 MWp Photovoltaic System - Armoush Tourist Investment Company

McDonalds Jordan

2.0 MWp Photovoltaic System

Coca Cola Bottling Company of Jordan (CCI)

1.6 MWp Photovoltaic System

Bank ABC

10 MWp Photovoltaic System

King Hussein Business Park (KHBP

Machrek Energy Development – MED SOLA; Fostering Solar Technology in the Mediterranean Area

ENPI CBC-MED

1.0 MWp Photovoltaic System; 2.2 MWp Photovoltaic System; 200 kWp Photovoltaic Systems for 10 Schools

Maan Development Company

5.75 MWp Photovoltaic System

Ministry of Energy and Mineral Resources (MEMR)

Engineering Services including Civil Works, Security System, & Micro Grid Design (Inspection, Design, Installation & Commissioning)

Jordan Nuclear Power Company (JNPC) & Worley Parsons

10 KWp X 100 Photovoltaic Systems for 100 Public Schools

Princess Alia Foundation (PAF)

10 KWp X 59 Photovoltaic Systems for 59 schools

Jordan Renewable Energy and Energy Efficiency Fund (JREEEF)

234 KWp Photovoltaic System

Theodor Schneller School

3.3 MWp Photovoltaic System

United Nations Relief and Works Agency (UNRWA)

450 KWp Photovoltaic System

The Farm Dairy

1.2 MWp Photovoltaic System; 3.15 MWp Photovoltaic System

Jordan Silos & Supply General Company (JSSGC)

320 Solar Photovoltaic Pumping Systems in Jordan Valley & the Highlands

Ministry of Environment (MoEnv)

323 KWp Photovoltaic System

Jordan Civil Service Consumer Corporation in two Branches (Amman, Irbid)

2 MWp Photovoltaic System

Arab Aluminum Industry Co. Ltd (Aral)

550 kWp Photovoltaic System; 770 kWp Photovoltaic System

International Academy – Amman (IAA)

500 kWp Photovoltaic System

Jordan Securities Commission (JSC)

500 kWp Photovoltaic System

Jordan Radio & TV (JRTV)

770 kWp Photovoltaic System; 800 KWp Photovoltaic System

Philadelphia University

250 kWp Photovoltaic System

Arab Open University (AOU)

800 KWp Photovoltaic System

Jordanian Egyptian Fajr for Natural Gas Transmission and Supply

420 kWp Photovoltaic System

The Children's Museum – Jordan

750 kWp Photovoltaic System

King Hussein Foundation

200 kWp Photovoltaic System; 200 kWp Photovoltaic System

Al-Mashrek School

545 KWp Photovoltaic System

Princess Sumaya University for Technology (PSUT)

Wind Projects

Capacity Building in Wind Energy and Concentrating Solar Power Project (WECSP)

Funder: EU

Duration: 2011–2014

Installation and Operation Reference Mast At Al Fujeij

Al Fujaij Wind Turbine

A 1.65 MW wind turbine is installed at Al-Fujeij site which is part of the TWT-1.65 wind turbine family from MTOI-Spanish Company. The TWT-1.65 wind turbines have active pitch power control and variable rotor speed.

Rental, Installation, Maintenance and Operation for a 60 Metre Meteorological Mast at Al Tafila – CUBE

Bio Energy Projects

Small Biogas Pilot Unit in Zaatari Camp

Donor: EU

Duration 2019–2020

Client: UN-FAO

Objective: Design, build and operate a Biogas Pilot unit at Zaatari Refugee Camp in Mafraq, Jordan.

Demonstration of Solar Heated Biogas Digester in Poultry Farm

Donor: Global Environmental Facility – Small Grants Programme

Duration: 2015–2016

Objective: The aim of the project was to develop a sustainable system to treat the animal manure that is produced in poultry farms, also thermal energy to cover the energy needs of the farms, additionally a sterile fertilizer for agricultural purposes. The system uses three technologies as a hybrid system; solar thermal energy and anaerobic digestion to treat the poultry manure.

Developing Integrated Waste Recycling Systems for Agricultural and Environmental Safety Purposes in Rural Communities in Jordan

Donor: USAID

Duration: 2013–2015

Objective: The aim of the project was to develop a sustainable system to treat the animal manure that is produced in livestock breeding farms, also generate renewable energy to cover the energy needs of the farms, additionally a sterile fertilizer for agricultural purposes. The

system uses three technologies as a hybrid system; solar thermal energy, Solar Photovoltaic and anaerobic digestion to treat the cows manure.

The Climate Effect of Biomass and Roadmap for Development of Bioenergy Projects in Jordan

Donor: Friedrich Ebert

Duration: 2018

Objective: The project aims at preparing a comprehensive study that assess the annual amount of organic waste (Biomass) that is produced from several targeted sources in Jordan, and calculating the annual GHG emission from this Biomass and its effect on the environment. Moreover, the study will include a roadmap to propose different technologies to treat the annual amounts of targeted biomass using appropriate green Technologies.