

# Renewable Power Integration Technical Assistance & Capacity Building in Jordan

## Project Description

It is projected by the Jordan Ministry of Energy that the primary energy growth demand from 2008 to 2020 is expected to be 5.5%. The country currently imports nearly 97% of its energy needs namely through oil and gas. The expected amount of energy results in 15 million tons of oil equivalent to be needed by 2020. Additionally, the existing electricity costs in Jordan range from \$0.22 to \$0.42 per kWh for residential to commercial consumers. In 2007 the Ministry issued a National Energy Strategy that targets 7% of electricity production from renewables by 2015 and 10% by 2020. Due to this strategy and coupled with the recent removal of the net metering renewable capacity limit of 5 MW will greatly increase the opportunity for new projects to be developed with the approval of the transmission provider (NEPCO) or distribution provider (JPSCO, IDECO, EDCO).

## Need

Due to the increased penetration of renewable energy to meet the energy targets, challenges will arise due to the lack of existing infrastructure to support the change in a generation.

- Forecasting and dispatch tools will be needed to optimally dispatch the added renewable energy
- Increased discussions on Interconnection Agreements (IA) and Power Purchasing Agreements (PPA) require careful attention
- Study impacts of renewable generation on the system and properly plan infrastructure to support renewables
- Cost of integration of large projects on transmission and impact on the operation and need for recovery mechanisms and introduction of wheeling



## Results

- Recommendations to NEPCO for IRR forecasting, unit commitment and dispatch, project scheduling and communication with National Load Control Center (NCC)
- Provided guidance and template on technical language to include in future PPA while in transition to new IRR Grid Code
  - Educated and provided on-site support to the NEPCO engineers for creating and revising IRR operating protocols and testing and commissioning procedures
- Provided on-site training to NEPCO engineers for completing IRR testing for Tafila wind project prior to approving interconnection
  - Provided on-site training to NEPCO engineers for completing and reviewing GIS for IRRs
- Facilitated meetings between NEPCO and IRR developers to resolve any questions related to PPAs, testing and commissioning, technical capabilities, and operations for the Tafila wind project