



Request for Proposals Signature Research Projects

The Kuwait-MIT Center for Natural Resources and the Environment (CNRE) will sponsor large collaborative research projects between MIT and research institutions in Kuwait. We invite interested Faculty members and researchers at MIT, and their collaborators in Kuwait, to submit proposals.

Area of interest:

1. Water

a. *Technology:*

- i. Hybrid MSF/RO desalination plants design and optimization.
- ii. Advanced membranes for water desalination, water recycling and water/oil separation.
- iii. Solar-driven desalination plant, either PV/RO or thermo/MSF.
- iv. Desalination based on electric dialysis or electro-osmosis.
- v. Leak detection in pipes and storage facilities.
- vi. Monitoring water quality.
- vii. Greywater systems.
- viii. Rain generation technology.

b. *Social/Policy/Economic Implications:*

- i. Water conservation and recycling.
- ii. Regional cooperation on large water resource management, *e.g.* Wetland reclamation projects.
- iii. Water, sanitation and hygiene.

2. Smart Grids and Energy Efficiency

- a. Modeling and feasibility studies regarding the integration of intermittent renewable energy, and variable energy resources (wind, solar, tidal waves, geothermal, etc.)
- b. Reliable, intelligent, and efficient operations of distributed energy grids with increased penetration of intermittent sources (e.g. Assessment of energy storage needs.)
- c. Energy generation and storage technologies.

Background:

- Kuwait obtains most of its fresh water needs from desalination.
- Kuwait's current desalination plants are based on relatively old MultiStage Flash (MSF) technology.
- Steam from power plant is used to drive desalination plants.
- Reverse Osmosis (RO) is not very popular in Kuwait yet, because of the high salinity (and common oil contamination) of the Arabian Gulf seawater, which increases the osmotic pressure and requires



higher pumping power to desalinate. However, there are new RO projects starting in Saudi Arabia and UAE.

- The Shagaya renewable energy complex project is a recent initiative in Kuwait (10MW Wind, 10MW PV, 50MW CSP.)

Timeline:

- September 4, 2013: RFP issued & distributed
- November 20, 2013: Pre-proposal deadline (5pm ET)
- January 6, 2014: Attend workshop in Kuwait (Selected pre-proposals; tentative)
- January 20, 2014: Invitation to submit full proposals
- March 1, 2014: Full proposal deadline
- June 1, 2014: Notice of Awards
- September 1, 2014: Effective Starting Date

Award Information:

Estimated Number of Awards: 2 (up to 3-year duration)

Anticipated Funding Amount: Total up to \$3,000,000 at MIT, \$1,000,000 in Kuwait per award

Eligibility Information:

Organization Limit:

Each proposal must have PI(s) from MIT, and co-PI(s) from an academic/research institution in Kuwait.

Collaborators from the industry in Kuwait can be considered on a case by case basis to meet the collaboration requirement. Industrial collaborators do not qualify to receive any fund amounts.

PI Limit:

Principal Investigators must be at the faculty level or eligible for a Principal Investigator status by MIT and/or their local institution in Kuwait.

Each PI/co-PI may participate in more than one proposal in response to this solicitation. However, multiple awards will not be granted for the same PI for the same solicitation cycle (considering both exploratory and signature projects).



Review Criteria:

Our review criteria will consider several factors including:

- Intellectual and Innovation Merit
- Broader Impact
- Relevance to the research areas in this solicitation
- Relevance to Kuwait
- Adequacy of plan and timeline for carrying out collaborative research
- Adequacy of the requested budget for the proposed work

Application Process:

Application material (forms and templates) are accessible from our website (<http://cnre.mit.edu>) under Funding Programs.

Interested investigators from MIT and Kuwait are strongly encouraged to contact the Center directly indicating their areas of interest. The Center will help in matching the interests of investigators from Kuwait and MIT.

Full-proposals should be submitted through MIT Office of Sponsored Programs (OSP). Please note that OSP requires at least [five working days](#) to review and approve a proposal for submission. Pre-proposals need not be routed through OSP and can be submitted directly.

All communication and completed proposal applications are to be submitted via e-mail to:

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