Sincere thanks go to the following:

- Ministry of Higher Education, Saudi Arabia
- Ministry of Foreign Affairs, Saudi Arabia
- Ministry of Finance, Saudi Arabia
- Center of Research Excellence - Renewable Energy, Saudi Arabia

Links of interest:

- Center Home Page: http://ccwce.mit.edu/
- KFUPM Home Page: http://www2.kfupm.edu.sa/
- MIT Home Page: http://web.mit.edu/

Center of Excellence for Scientific Research Collaboration with MIT

King Fahd University of Petroleum & Minerals
Dhahran – 31261, Saudi Arabia

For further information, contact:
Tel. 966-3-860-7416
kfupm-mit-coll@kfupm.edu.sa

5TH WORKSHOP ON CLEAN WATER AND CLEAN ENERGY

January 11 through 13

2011

King Fahd University of Petroleum & Minerals
Dhahran, Saudi Arabia
### TUESDAY (11 Jan 2011) AGENDA

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>8:30 am</td>
<td>Welcome &amp; Introduction (H.E The Rector and Center Directors)</td>
</tr>
</tbody>
</table>
| 9:00 am| Engineering Design I: inspiring technical innovation via capstone product development  
A. N. Shuaib / D. R. Wallace                       |
| 9:20 am| Engineering Design II: inspiring technical innovation in the sophomore and junior years  
N. Merah / D. R. Wallace                             |
| 9:40 am| BREAK                                                                   |
| 10:00 am| Water Desalination Education M. Antar / J. H. Lienhard                  |
| 10:40 am| Design and Manufacturing of Solar Power Systems and Devices for Challenging Environments  
A. K. Sheikh / S. Dubowsky                           |
| 11:10 am| Design Protocols and Risk Management in Large Complex Projects with Applications to Water  
A. S. Eleiche / W. Seering                            |
| 11:40 am| The Development of Leak and Contamination Sensors for Water Pipeline Networks  
R. Ben Mansour / K. Youcef-Toumi                      |
| 12:15-1:30 pm| prayer & lunch break                                                   |

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### WEDNESDAY (12 Jan 2011) AGENDA

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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</table>
| 9:00 am| Novel Nanostructured Membranes for Seawater Desalination  
T. Laoui / E. N. Wang, R. Karnik                                     |
| 9:30 am| Multi-Scale Design of Next Generation Reverse Osmosis (RO) Membranes for Seawater Desalination  
Z. Khan / M. C. Boyce                                              |
| 10:00 am| Seawater Desalination using Thermal, Solar, and Hybrid Systems, including Humidification Desalination  
M. Antar / J. H. Lienhard                                        |
| 10:30 am| BREAK                                                                   |
| 10:50 am| Optimization of Hybrid Cogeneration Facilities for Seawater Desalination and Power Production  
M. Sharqawi / A. Mitsos                                          |
| 11:10 am| Thermoelectrics and Thermal Fluids for Concentrated Solar Thermal Plants  
B. S. Yilbas / E. N. Wang                                         |
| 11:45-1:00 pm| prayer & lunch break                                                   |

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### THURSDAY (13 Jan 2011) AGENDA

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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</table>
| 9:00 am| Oxy-Combustion for Carbon Capture Using Ion Transport Membrane Reactors: Membrane Development, Combustion Studies and System Integration  
M. Habib / A. F. Ghoniem                                        |
| 9:30 am| Toward Higher Efficiency, Scalable Thin Silicon Materials and Solar Cells  
S. A. M. Said / T. Buonassissi                                     |
| 10:00 am| Hybrid Concentrated Solar-Fossil Fuel Electric Power Generation and its Application in Saudi Arabia (HyCS-NPC)  
E. M. A. Mokheimer / A. F. Ghoniem                                |
| 10:20 am| BREAK                                                                   |
| 10:40 am| Performance Evaluation and Life Prediction Modeling of Industrial Gas Turbine Blade  
Z. Gasem / L. Anand                                                 |
| 11:10 am| Technology Licensing J. Freedman / MIT TLO                             |
| 11:50| closing remarks                                                         |
| 12:00-1:30 pm| prayer & lunch break                                                   |

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**end workshop**