Summary:

Presentation summarizes the results of a comprehensive analysis to assess the impacts and the benefits of energy efficiency measures on total energy consumption, peak electrical demand, and carbon dioxide emissions specific to commercial buildings for all six countries part of the Gulf Cooperation Council (GCC). In particular, optimal performance of a prototypical commercial building is analyzed in each of the GCC countries including Bahrain, Kingdom of Saudi Arabia, Kuwait, Oman, Qatar, and United Arab Emirates. Specifically, an optimization using life-cycle cost analysis is developed in order to select feasible energy efficiency measures as design alternatives to enhance the energy performance of commercial buildings in the GCC region. The optimized design alternatives for office buildings in all six countries in the GCC region resulted in annual energy consumption, peak electrical demand, and carbon dioxide emission savings ranging on average from 62% to 69 % with payback periods ranging from 2.0 to 3.5 years to implement the feasible measures.