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Investigating Best Practice Energy Efficiency Policies and Programs, and Their Replication Potential for Residential Sector of Saudi Arabia

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Abstract : Residential sector consumes more than half of the produced electricity in Saudi Arabia, and fossil fuel is the main source of energy to meet growing household electricity demand in the Kingdom. Several studies forecasted and expressed concern that unless the domestic energy demand growth is controlled, it will reduce Saudi Arabia's crude oil export capacity within a decade and the Kingdom is likely to be incapable of exporting crude oil within next three decades. Though the Saudi government has initiated to address the domestic energy demand growth issue, the demand side energy management policies and programs are focused on industrial and commercial sectors. It is apparent that there is an urgent need to develop a comprehensive energy efficiency strategy for addressing efficient energy use in residential sector in the Kingdom. Then again as Saudi Arabia is at its primary stage in addressing energy efficiency issues in its residential sector, there is a scope for the Kingdom to learn from global energy efficiency practices and design its own energy efficiency policies and programs. However, in order to do that sustainable, it is essential to address local contexts of energy efficiency. It is also necessary to find out the policies and programs that will fit to the local contexts. Thus the objective of this study was set to identify globally best practice energy efficiency policies and programs in residential sector that have replication potential in Saudi Arabia. In this regard two sets of multi-criteria decision analysis matrices were developed to evaluate the energy efficiency policies and programs. The first matrix was used to evaluate the global energy efficiency policies and programs, and the second matrix was used to evaluate the replication potential of global best practice energy efficiency policies and programs for Saudi Arabia. Wuppertal Institute's guidelines for energy efficiency policy evaluation were used to develop the matrices, and the different attributes of the matrices were set through available literature review. The study reveals that the best practice energy efficiency policies and programs with good replication potential for Saudi Arabia are those which have multiple components to address energy efficiency and are diversified in their characteristics. The study also indicates the more diversified components are included in a policy and program, the more replication potential it has for the Kingdom. This finding is consistent with other studies, where it is observed that in order to be successful in energy efficiency practices, it is required to introduce multiple policy components in a cluster rather than concentrate on a single policy measure. The developed multi-criteria decision analysis matrices for energy efficiency policy and program evaluation could be utilized to assess the replication potential of other globally best practice energy efficiency policies and programs for the residential sector of the Kingdom. In addition it has potential to guide Saudi policy makers to adopt and formulate its own energy efficiency policies and programs for Saudi Arabia.

Keywords : Saudi Arabia, residential sector, energy efficiency, policy evaluation
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