1054-90-241    **Kourosh Modarresi\*** (`kouroshm@stanfordalumni.org`), P O Box 19544, Stanford, CA 94309.
*An Approximate Solution for Smart Grid's Optimization Problem.*

Smart grids are an important step in addressing the difficulties that utilities are to be facing in coming years. One major difficulty is the variability of both electricity production and the demand for the electricity. The major challenge is that given the variability, and by using an integrated database system, to find an optimal scheduling for both electricity production and demand.

The optimization problem requires the application of mathematical programming which, in this case, is a mixed-integer programming, where some of the optimization (decision) variables are constrained to be integers. The significant fact is that smart grids involve distributed energy production sources and thus the number of the electricity generating units is a large number. That leads to a large number of integer-valued decision variables. As a consequence, the smart grid optimization problem is a NP hard problem. In this work, we consider an approximate approach for the solution of the resulting optimization problem. (Received September 15, 2009)