1056-90-2067 **Kourosh Modarresi*** (kouroshm@stanfordalumni.org), P O Box 19544, Stanford, CA 94309.
Mathematical Analysis of Smart Grids Using Randomized Algorithms.

Mathematical Analysis of Smart Grids Using Randomized Algorithms Smart grids address the issue of stochastic electricity demand and production in addition to other issues such as security and system data integration. Though the more conventional demand has always been variable, the increasing numbers of plug-in-hybrid electric vehicles (PHEVs) and plug-in electric vehicles (PEVs) in the coming years has made the management of the stochastic demand a critical issue for power grids and energy sustainability. The increasing rules of solar and wind energy sources are the main source of variability for electricity production. The solution and analysis of smart grids problem using deterministic algorithms is computationally very expensive and unrealistic, especially due to the high dimension of the problem. In this work we show how effective alternative algorithmic schemes, using randomized algorithms, could be used for the simulation and optimization approaches of smart grid problems. (Received September 23, 2009)