

Home Energy Management System in Smart Grid in Order to Minimize Generation Cost Using Particle Swarm Optimization Algorithm

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Abstract This thesis has two parts. In the first part the target is consumers cost management by using demand side management (DSM) programs, electric vehicles (EVs) and distributed generations (DGs). In this part, if consumers load be higher than DGs generation, it must be bought the network. Then network tariffs must be applied to consumers' bill. In this thesis three types of time-based demand response (DR) have been applied to consumers and the results have been evaluated. If the consumers load be lower than DGs generation, it must be used DGs to supplying the load. In the second part of thesis the effects of implementing these programs has been analyzed on network parameters. In this part the optimal location of these programs have been determined in the distribution network. The objective function is power loss. So the optimal location of these programs is the buses that reduces the power loss much more. After determining the optimal location of these programs the effects of these programs on reliability has been analyzed, too. **Keyword: DSM, EV, DGs, Consumers' Cost Reduction, Power Loss, Network Reliability**

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