Unit commitment in larg scale virtual power plants considering electrical and thermal storages

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In recent years electrical market is gradually changing united format to the parallel one. On the other side, powerhouses based on novel energy forms are cause to create and extend of private companies and decentralized production. So that some concepts such as tiny networks and virtual powerhouses are more attractive for utilization of power systems. In this regard, in addition to choose and use suitable technologies in type design components production capacity and energy supplier, some topics such as optimized and accurate planning of these supplies and other components in the tiny networks are so notable. Because on one hand, fossil fuels needed for traditional powerhouses are going to be finished, and on the other hand interest to use clean energy and maximize the financial profits, researching in this field is more extending. In this thesis a method for use the next day of a virtual powerhouse, that is contains of several virtual tiny powerhouses, is produced which the purpose is that to maximize the utilization profit in the next day. In this research storage of electrical and thermal energy are both considered, so that each virtual tiny powerhouse in addition to the suppliers has several novel energy manufacturer, simultaneous production of electricity-thermal energy unit, boiler ,and electrical and thermal charges. In this research MATLAB software and genetic optimization algorithm are used to optimization. The results confirm the effectiveness of this method.

Keywords : reproducible energy sources, energy supplier, simultaneous production of electricity-thermal energy unit, virtual powerhouse