Electrical Vehicle charging and pricing strategies in Smart Grid environment

Résumé du projet de recherche (Langue 1)
This thesis is part of a large European research project covering almost all the aspects of Smart Grid, from the end-users' equipment to the large energy production facilities. The thesis itself aims to develop and evaluate various scheduling and pricing strategies for Electrical Vehicle (EV) charging in Smart Grid environment. The first part of the thesis consists in proposing original scheduling charging strategies according to the electrical constraints of the system. Two main types of constraints have to be considered. The first one is inherent to the behavior of the electrical network interconnecting locally the charging stations and the way charging networks are themselves interconnected and powered in the global network. The second type of constraint is related to the partially unpredictable behavior of the charging dynamics of an EV's battery. Once these first problems have been solved, the second phase of the thesis consists in managing the economical relationships between electrical consumers (EV charging infrastructures, domestic electrical devices) and energy production sources.

Résumé du projet de recherche (Langue 2)
Scientific objectives: - To understand the electrical behavior of a EV charging infrastructure - To model the dynamic behavior of a charging infrastructure taking into account the availability of green energy sources (wing, sun) in parallel to traditional electrical energy sources. Requested skills: - To have a good knowledge in operational research (exact and approximate optimization techniques) - Good knowledge of a programming language used in the industry (java, C# ...) - Fluent in French and in English - Open to oral and written communication in order to be able to work in team

Informations complémentaires (Langue 1)
This project is part of the ITEA SEAS (Smart Energy Aware Systems) research project. This project starts in 2014 and ends in 2017. The SEAS project is part of the CALL 7 initiated by the European Commission. The SEAS consortium includes 7 countries: Belgium, Finland, France, Portugal, Romania, Spain and Turkey.

Informations complémentaires (Langue 2)
This thesis will be achieved in close collaboration with the CNR company, a leading French actor of hydraulic energy sources and distribution.