

Analysis of Suitable Operating Models for Charging Facilities of Electric Vehicles in Taiwan

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With the Taiwan government's promotion policies related to electric vehicles (EV), the domestic electricity demand for EV charging facilities and the number of installations are expected to grow significantly. Due to the future needs for power supplying facilities and communication standards of EV charging system installation, the issues of power line deployment of EV charging facilities, energy management strategies of charging point operators (CPO), and international communication standards of EV charging facilities should be further investigated to cooperate with the relevant development policies of Taipower company (TPC). This work collects domestic and foreign related cases and establishes a demonstration system for researches and discussions, a system which is beneficial to maintain the power supply quality and meet the requirements of EV charging facilities deployment, energy management optimization, and information interoperability. Besides, this research integrates G2V and V2G operational models and develops the energy management strategies and related regulations for power industries. In addition, the communication protocols, such as OCPP, OSCP, and OpenADR are integrated and tested in the demonstration system. Based on the development and tests of related technologies in this research, the impact caused by a large number of charging facilities on the power grid can be effectively reduced. A win-win situation is achieved to enhance the stability of regional power systems and satisfy the power demand of electric vehicles, simultaneously.

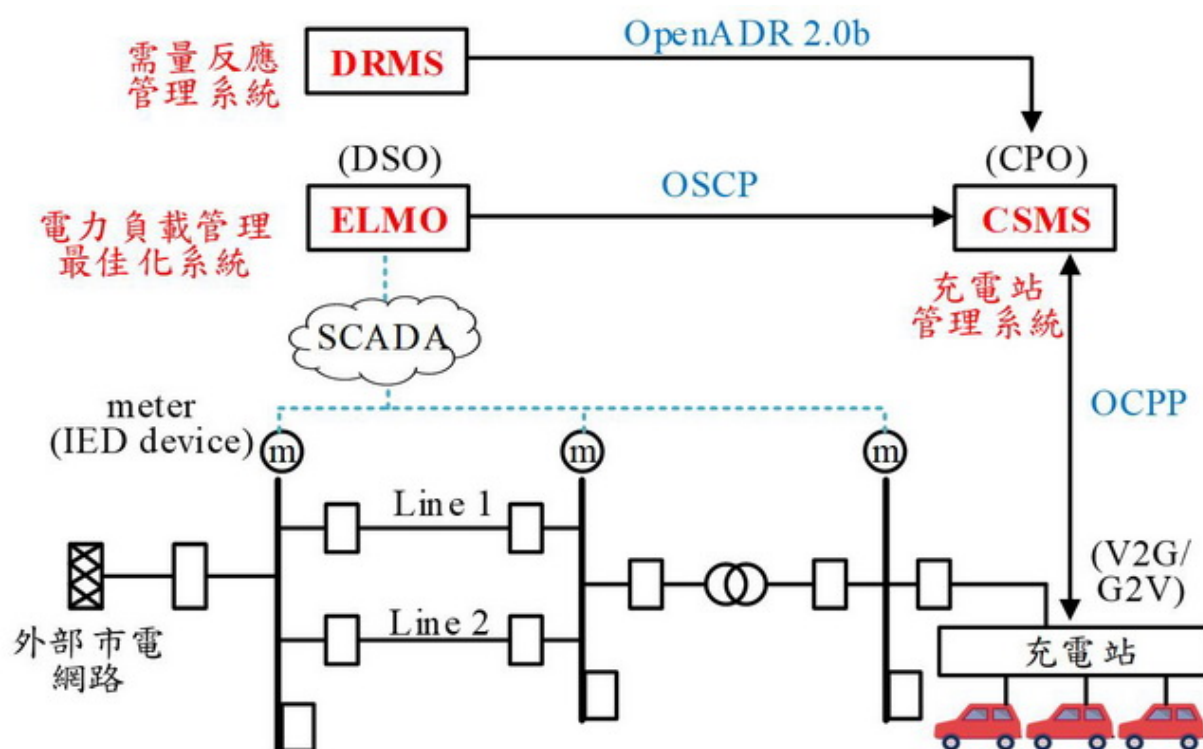


Figure 1. The schematic diagram of integrated structure for EV charging facilities.