This paper proposes a novel cooperative charging strategy for a smart charging station in the dynamic electricity pricing environment, which helps electric vehicles (EVs) to economically accomplish the charging task by the given deadlines. This strategy allows EVs to share their battery-stored energy with each other under the coordination of an aggregator, so that more flexibility is given to the aggregator for better scheduling. Mathematically, the scheduling problem is formulated as a constrained mixed-integer linear program (MILP) to capture the discrete nature of the battery states, i.e., charging, idle and discharging. Then, an efficient algorithm is proposed to solve the MILP by means of dual decomposition and Benders decomposition. At last, the algorithm can be implemented in a distributed fashion, which makes it scalable and thus suitable for large-scale scheduling problems. Numerical results validate our theoretical analysis.