Communication power battery charging and discharging

What is smart charging & discharging?
Smart charging and discharging technology reduce energy costs, voltage deviations, and surges in transformer power and line currents and enhance a distribution network's technical stability, efficiency, and reliability. Therefore, coordinated charging for EV owners and grid operators is the most efficient and valuable strategy.

What are the effects of controlled charging & discharging?
The article briefly discusses the effects of electric vehicle penetration levels,charging profiles,and various other aspects of controlled charging and discharging from a performance perspective. This includes overloading,deteriorating power quality,and power loss.

How do EV charging and discharging strategies work?
By controlling the charging and discharging of EVs, their demand can be transferred from peak to non-peak periods to help reduce losses and improve the grid's load factor. Optimal EV charging and discharging strategies for peak shaving also reduce the need to invest in the grid to increase the equipment capacity.

How do Charger-discharger strategies affect power systems?
Charger-discharger strategies are compared in terms of their effects on power systems, including controlled and uncontrolled charging and discharging, delayed charging and discharging, and intelligent scheduling. EV battery charging strategies are also discussed concerning electrical distribution networks.

How to reduce harmonic distortions from charging systems?
However, the harmonic distortions from charger systems can be significantly reduced by designing the charger circuits, controlling the charging strategy, and adding filters to the circuit (Zarbil and Vahedi, 2023). 5. Drawbacks and solutions of vehicle-to-grid technology

What are the benefits of Smart EV charging & discharging?
In critical circumstances,the capacity of the EV charging station can also be used to increase the network's stability and recover essential loads . Another benefit that can be gained by smart EV charging and discharging is an improvement in the efficiency of distribution networks.

Battery charging connects the vehicle to the electric grid, and many factors must be considered, such as available voltages and wiring, standardization, safety, communication, ergonomics, and more. The chapter reviews various charging architectures and charging standards and describes conductive and wireless standards. It discusses the boost ...

The state-of-charge (SOC), measured and applied for measuring charging/discharging characteristics is an important parameter for defining the performance of a battery. Thus, accurate estimation of ...

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Power-line communications for smart grid: Progress, challenges, opportunities, and status. Renewable and Sustainable Energy Reviews. 2017;(67):704-751. Google Scholar. 4. Bharathidasan M, Indragandhi V, Suresh V, Jasinski M and Leonowicz Z. A review on electric vehicle: Technologies, energy trading, and cyber security. Energy Reports. 2022;(8): ...

With automated metering infrastructure (AMI) communications in houses, smart EV charging stations, and smart building management systems in smart grid-oriented power system, EVs are expected...

3 ???· The limited driving range, insufficient charging infrastructure, and necessary charging time are the primary factors that negatively impact intercity travel for electric vehicles (EVs). In ...

2 ???· For battery charging and discharging, the coil design must account for magnetic field leakage and misalignment, which can cause changes in the coupling coefficient. Rectangular coils with ferrite or aluminum shielding allow the flux to flow unidirectionally 82]. The rectangular coil shape is also suitable for semi-dynamic bidirectional power transfer. The extension of the ...

EV owners can reduce their charging costs and even earn money by recharging their EV batteries during low-energy-price periods and discharging them during high-energy ...

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