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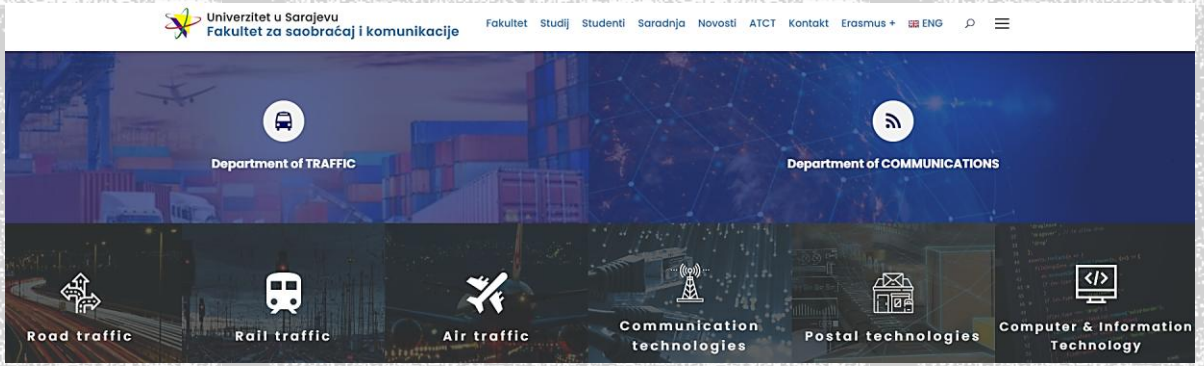


E – INFRASTRUKTURA ZA ELEKTRIČNA VOZILA

EV INFRASTRUCTURE

EV INFRASTRUCTURE

EV INFRASTRUKTURA

An electric vehicle (EV) is a car that uses one or more electric propulsion engines. Electricity can be stored in a vehicle battery, fuel cell, flywheel, or supercapacitor. Combined with an intelligent grid, an EV can behave as a distributed power storage device.

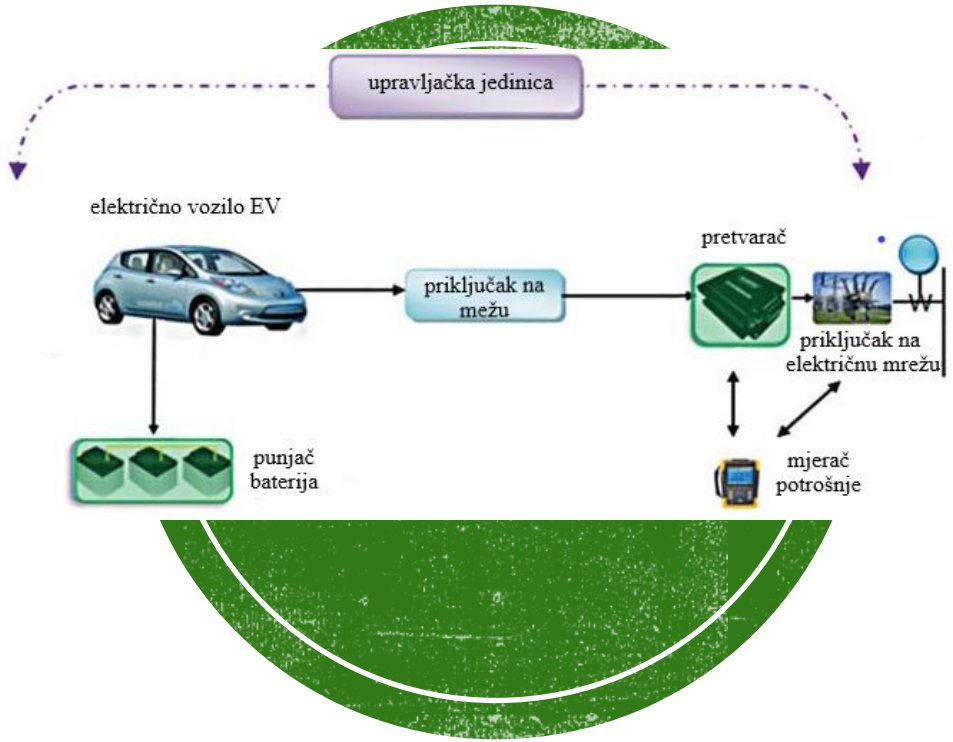
Električno vozilo (EV) je automobil koji koristi jedan ili više električnih pogonskih motora. Električna energija može se skladištiti u bateriji vozila, gorivoj ćeliji, zamašnjaku ili superkondenzatoru. U kombinaciji s inteligentnom mrežom, EV se može ponašati kao distribuirani uređaj za pohranu energije.

EV INFRASTRUCTURE

EV INFRASTRUKTURA

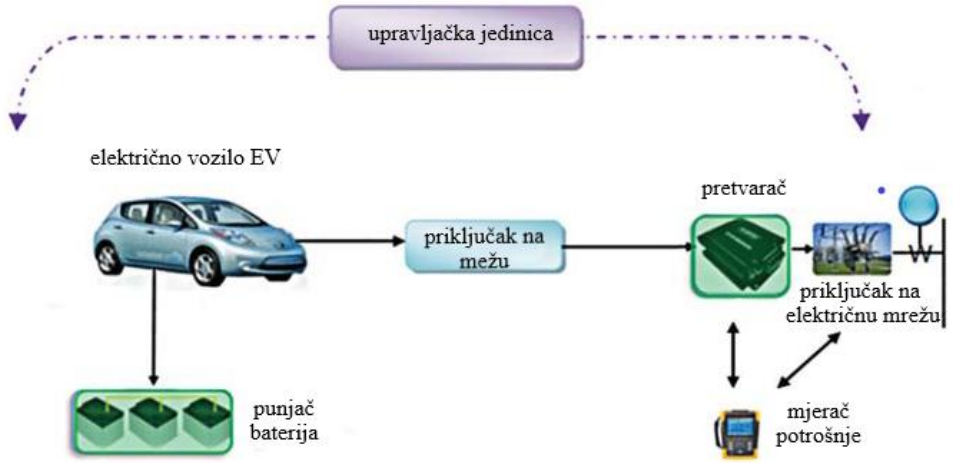
EV infrastructure encompasses the equipment and systems necessary for supporting electric vehicles (EVs), including chargers, battery exchange stations, and the necessary electrical infrastructure. This infrastructure is crucial for enabling the widespread adoption of EVs and includes both public and private charging options, as well as efforts to improve grid infrastructure.

Infrastruktura za električna vozila obuhvaća opremu i sustave potrebne za podršku električnim vozilima (EV), uključujući punjače, stanice za zamjenu baterija i potrebnu električnu infrastrukturu. Ova infrastruktura ključna je za omogućavanje širokog prihvaćanja električnih vozila i uključuje javne i privatne opcije punjenja, kao i napore za poboljšanje mrežne infrastrukture..



The IEC 61850 standard allows the regulation of substation communication, and its latest expansion IEC 61820-7-420 targets abstract information and data models related to distributed energy sources DER (**Distributed Energy Resource**).

Standard IEC 61850 dopušta reguliranje komunikacije trafostanice, a njegovo najnovije proširenje IEC 61820-7-420 cilja na apstraktne informacije i modele podataka povezane s distribuiranim izvorima energije DER (**Distributed Energy Resource**).



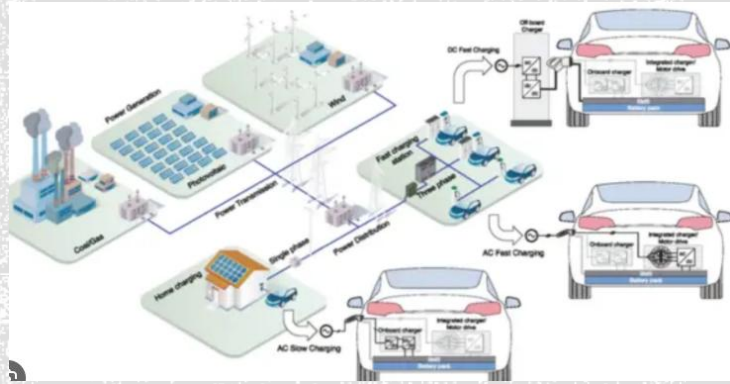
Electric vehicles are connected to the network via inverters and DC switches. Extended FSEQ, DRCC, DRCS and DRCT can be used for supplemental network control. These models can be used for single EV and V2G engines consisting of several EVs.

Električna vozila su povezani s mrežom putem pretvarača i DC sklopke. Prošireni FSEQ, DRCC, DRCS i DRCT mogu se koristiti za dopunsku mrežnu kontrolu. Ovi modeli mogu se koristiti za jedno EV i V2G agregate koji se sastoje od nekoliko EV.

The load profile shows electrical load demand and can be monitored during days, weeks, months or even years. If one looks closely at the load profile, it can be clearly concluded that the load curve is not a straight line but has some ups and downs. This is because the demand for electricity is not constant in all time periods. For example, in the summer, when the temperature rises, people begin to use cooling systems. This is an additional burden in the summer.

Profil opterećenja pokazuje električnu potražnju opterećenja i može se pratiti u toku dana, tjedna, mjeseca ili čak godine. Ako se pobliže pogleda profil opterećenja, jasno se može zaključiti da krivulja opterećenja nije ravna linija, već ima neke uspone i padove. To je zato što potražnja za električnom energijom nije konstantna u svim vremenskim razdobljima. Na primjer, ljeti, kada temperatura raste, ljudi počinju koristiti sisteme za hlađenje. To je dodatno opterećenje ljeti.

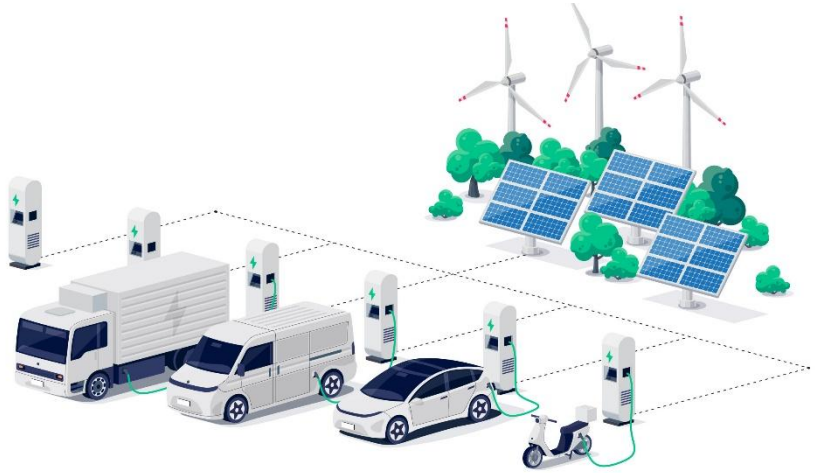
The effect of EV charging behaviour on the power system



UČINAK PONAŠANJA PUNJENJA EV NA ELEKTROENERGETSKI SISTEM

The effect of EV charging behaviour on the power system

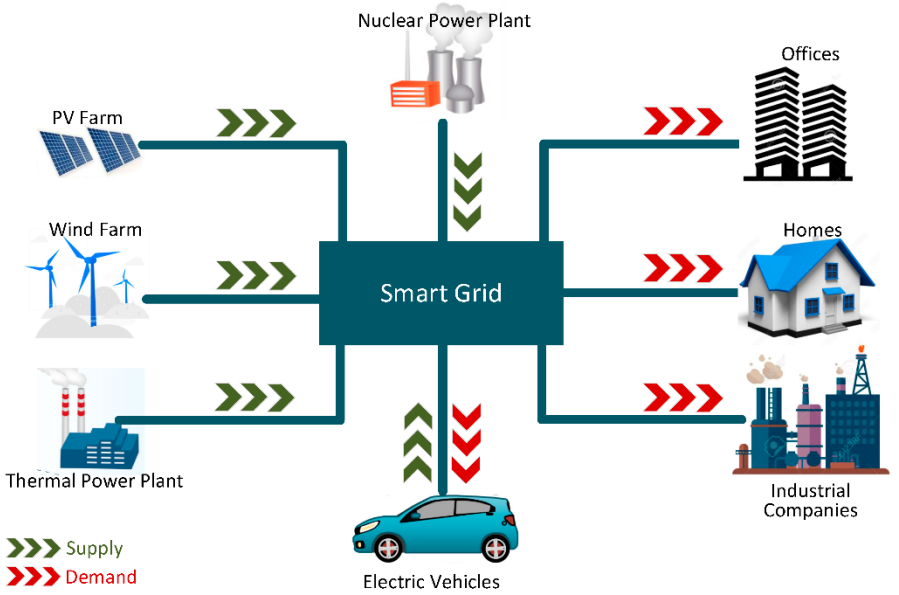
This variation of demand applies not only to long-term time periods, but also demand for load varies every day and every hour. High penetration of electric vehicles in cities will result in higher electricity demand as electric vehicles need to be charged with electricity.



Ova varijacija potražnje ne odnosi se samo na dugoročna vremenska razdoblja, već i potražnja za opterećenjem varira svaki dan i svaki sat. Velika penetracija električnih vozila u gradovima rezultirat će većom potražnjom za električnom energijom jer se električna vozila moraju puniti električnom energijom.

UČINAK PONAŠANJA PUNJENJA EV NA ELEKTROENERGETSKI SISTEM

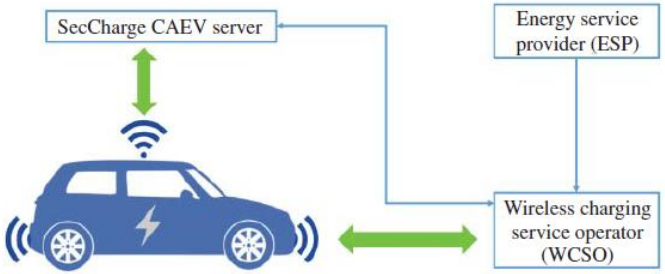
Improving EV technologies offers a variety of opportunities to improve the reliability and performance of the power system. More than improving system efficiency and performance status, fossil fuel consumption and air pollution will decrease when electric vehicles find their place in the transportation system.



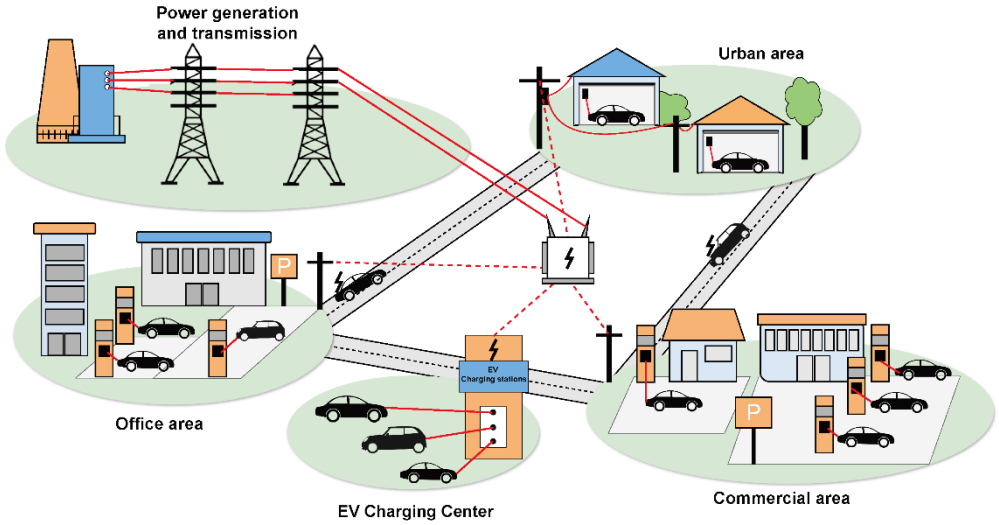
Poboljšanje EV tehnologija nudi različite mogućnosti za poboljšanje pouzdanosti i performansi elektroenergetskog sistema. Više od poboljšanja efikasnosti sistema i stanja performansi, potrošnja fosilnih goriva i onečišćenje zraka smanjit će se kada električna vozila nađu svoje mjesto u transportnom sistemu.

The effect of EV charging behaviour on the power system

PRILAGOĐAVANJE PARKIRALIŠTA ZA ELEKTRIČNA VOZILA



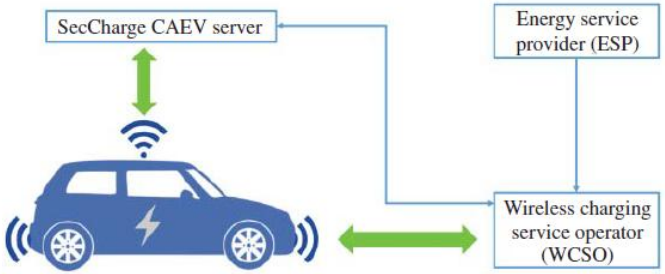
In addition, due to the benefits of demand response to obtain reliable and efficient electricity markets, DSR programs are considered a key component on the road to sustainable development. In this regard, it is important to find an efficient structure of demand response aggregation in electricity markets. To solve peak demand problems, different types of demand response programs are defined.



Osim toga, zbog prednosti odgovora na potražnju za dobivanje pouzdanih i efikasnih tržišta električne energije, programi upravljanja potražnjom smatraju se ključnom komponentom na putu održivog razvoja. U tom smislu, važno je pronaći efikasnu strukturu agregacije odziva potražnje na tržištima električne energije. Za rješavanje problema vršne potražnje definirane su različite vrste programa za odgovor na potražnju.

The effect of EV charging behaviour on the power system

PRILAGOĐAVANJE PARKIRALIŠTA ZA ELEKTRIČNA VOZILA



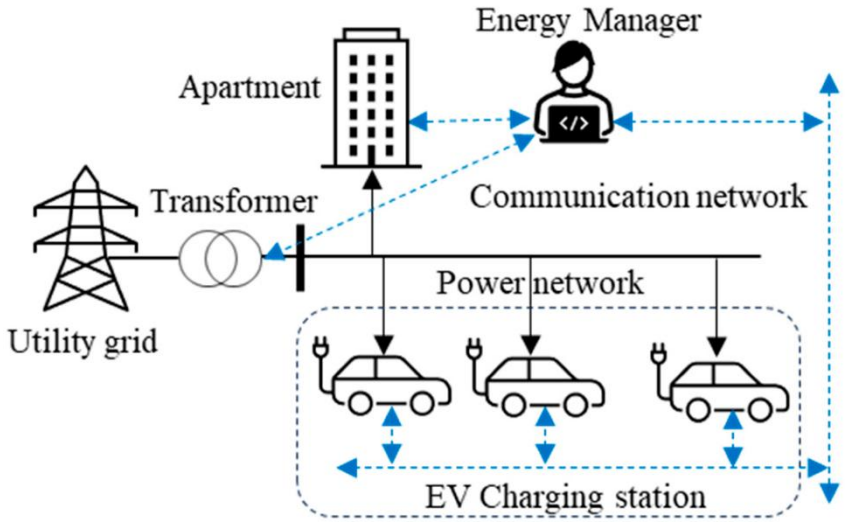
Considering the presence of electric vehicles in cities, it is possible to take the battery capacity of electric vehicles into demand response programs, and it is necessary to implement a smart charging schedule to avoid peak demand. The integration of electric vehicles into the electrical grid is crucial.

Uzimajući u obzir prisutnost električnih vozila u gradovima, moguće je uzeti kapacitet baterije električnih vozila u programe odgovora na potražnju, te je potrebno implementirati pametni raspored punjenja kako bi se izbjegla vršna potražnja. Integracija električnih vozila u električnu mrežu ključna.

The effect of EV charging behaviour on the power system

PRILAGOĐAVANJE PARKIRALIŠTA ZA ELEKTRIČNA VOZILA

One of the best solutions about integration is the operation of EV parking lots. Managing billing and discharging would be a challenging paradigm from a parking lot owner's perspective. Therefore, it can be said that when electric vehicle parking lots participate in demand response programs, both owners and operators in the market will benefit more.



Jedno od najboljih rješenja s obzirom na integraciju je rad EV parkirališta. Upravljanje naplatom i pražnjenjem bila bi izazovna paradigma iz perspektive vlasnika parkirališta. Stoga se može reći da kada parkirališta za električna vozila sudjeluju u programima odgovora na potražnju, i vlasnici i operateri na tržištu će imati veću korist.

The effect of EV charging behaviour on the power system

PRILAGOĐAVANJE PARKIRALIŠTA ZA ELEKTRIČNA VOZILA

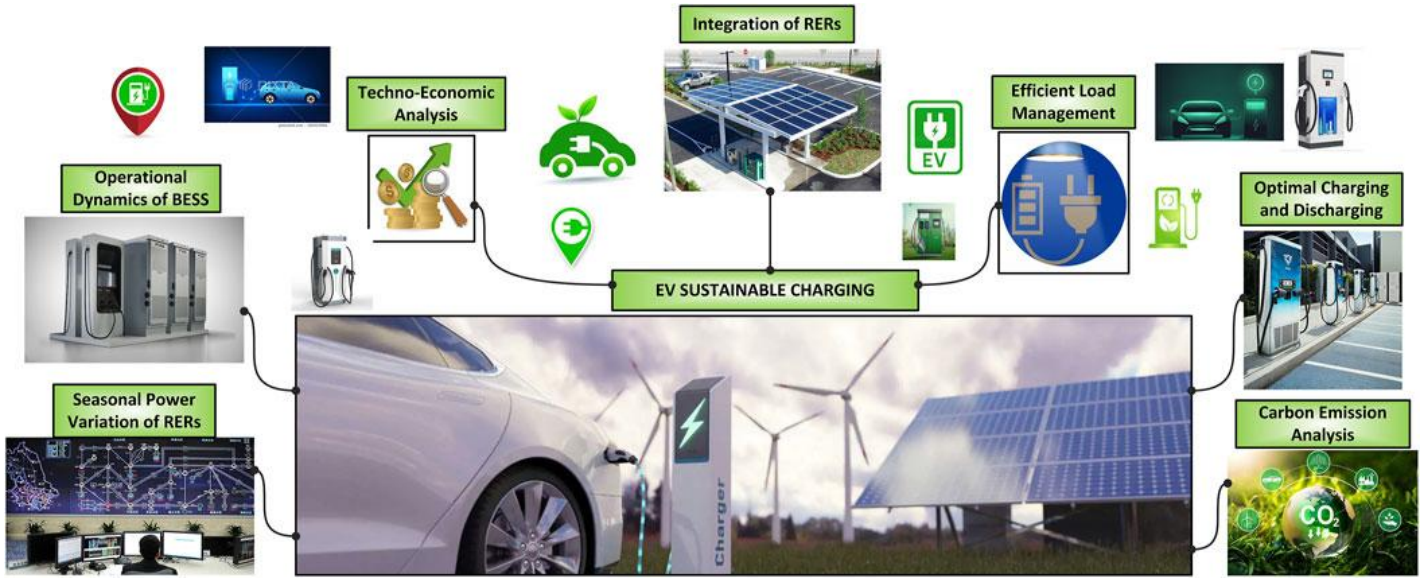
An accurate energy management system must be used to plan the charging of electric vehicles. This basic energy management system is needed to shift the demand for charging electric vehicles to periods of low demand, which is known as valley charging. Some well-known strategies, commonly used in an energy management system, are price incentives and schedules.

Tačan sistem upravljanja energijom mora biti angažiran za planiranje punjenja električnih vozila. Ovaj osnovni sistem upravljanja energijom potreban je za prebacivanje potražnje za punjenjem električnih vozila na razdoblja niske potražnje, što je poznato kao punjenje doline. Neke dobro poznate strategije, koje se obično koriste u sistemu upravljanja energijom, su cjenovni poticaji i raspored.

The effect of EV charging behaviour on the power system

PRILAGOĐAVANJE PARKIRALIŠTA ZA ELEKTRIČNA VOZILA

To improve the efficiency of these approaches, automated management systems must be implemented. In addition to a well-developed system, there is also a need for information. This requires very reliable communication technology to know, collect and process data.



Kako bi se poboljšala efikasnost ovih pristupa, moraju se implementirati automatizirani sistemi upravljanja. Za to je, osim dobro razrađenog sistema, potrebno i dovoljno informacija. Ovo zahtijeva vrlo pouzdanu komunikacijsku tehnologiju za poznavanje, prikupljanje i obradu podataka.

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