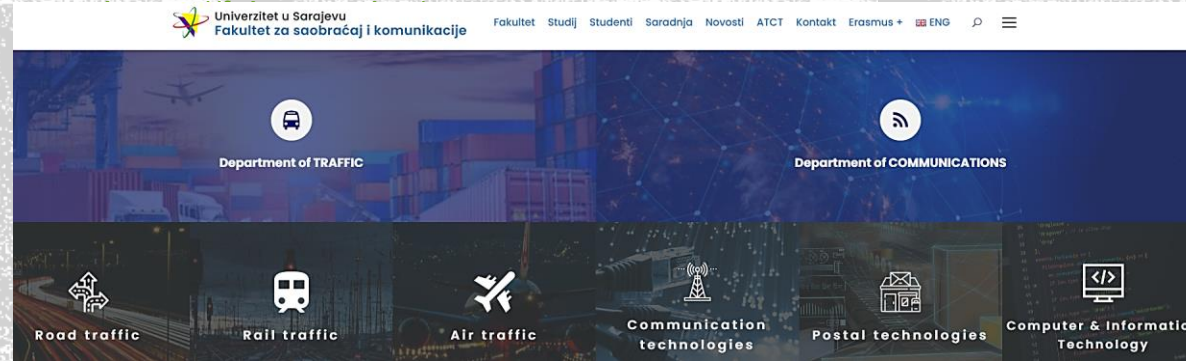


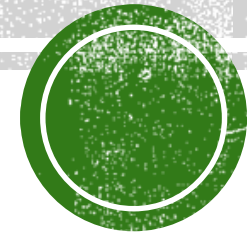


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**Električna i hibridna EV**

**Electric and hybrid EV**



# EVS. ELEKTRIČNA VOZILA

# EVs. ELECTRIC VEHICLES

Kada je samo električni pogon u vozilima onda je električno vozilo na baterijski pogon ili pogon sa gorivim ćelijama.

When only electric propulsion is in vehicles then an electric vehicle is battery-powered or powered with fuel cells.



# ELEKTRIČNA VOZILA NA BATERIJE

BEV  
Battery  
Electric  
Vehicle

Napajaju se električnom energijom i priključuju se kablom za punjenje baterija.

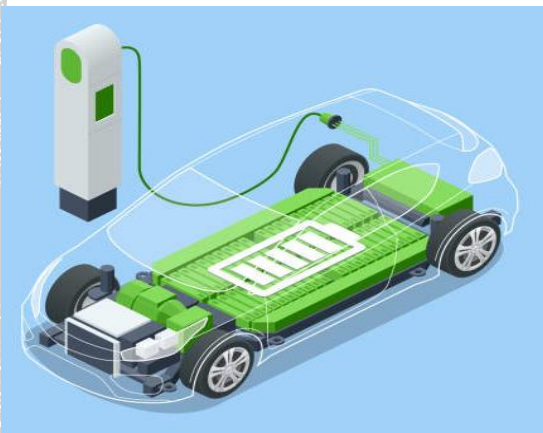


Photo 1. BEV Vehicle

They are powered by electricity and connected to charge batteries.

Napajaju se vodonikom i pretvaraju vodonik u električnu energiju u gorivoj ćeliji. FCEV emituje samo vodenu paru i topao vazduh.

They are powered by hydrogen and convert hydrogen into electricity in a fuel cell. FCEV emits only water vapor and warm air.

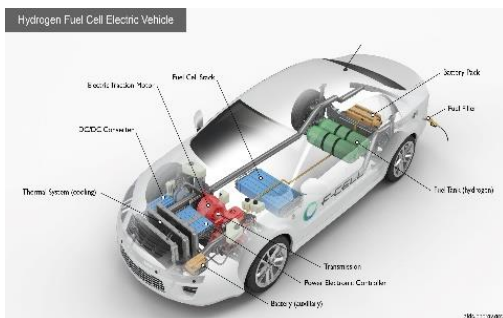
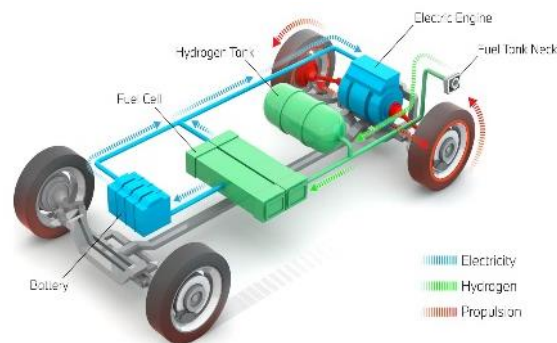
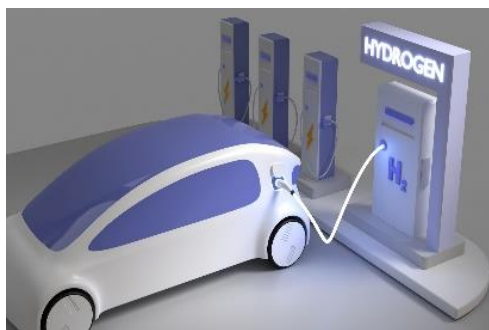
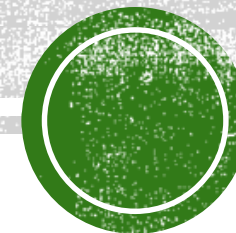


Photo 2. FCEV Vehicle

## Električna vozila sa gorivim ćelijama

FCEV  
Fuel Cell Electric Vehicles



## HEV. HIBRIDNO-ELEKTRIČNA VOZILA

## HEV. HYBRID-ELECTRIC VEHICLES

**Hibridno-električna vozila**, koja se nazivaju i HEV, napajaju se i benzinom i električnom energijom. U mnogim HEV-ovima, elektromotor koristi snagu baterije kako bi pomogao motoru ili samostalno kretao vozilo na kratkim udaljenostima. Kada se motor upali, baterija se puni. Postoje različiti nivoi hibridno-električnih vozila.

Hybrid-electric vehicles, also called HEV, are powered by both gasoline and electricity. In many HEVs, an electric motor uses battery power to help the engine or move the vehicle independently over short distances. When the engine starts, the battery is charged. There are different levels of hybrid-electric vehicles.

Postoje različiti načini kombiniranja snage elektromotora i motora SUS.

Paralelni hibridi — najčešći HEV dizajn — povezuju motor i električni motor sa pogonskim točkovima putem mehaničke spojke (elektromotor i motor SUS direktno pokreću točkove).

Serijski hibridi, koji koriste samo električni motor za pogon točkova vozila, najčešće se nalaze u plug-in hibridnim električnim vozilima.

There are different ways to combine the power of an electric motor and an IC engine (Internal Combustion engine).

Parallel hybrids — the most common HEV design — connect the motor and electric motor to the drive wheels via a mechanical clutch (electric motor and IC engine directly drive the wheels).

Series hybrids, which use only an electric motor to drive vehicle wheels, are most commonly found in plug-in hybrid electric vehicles.



**Mikro  
hibrid EV**

**Micro  
HEVs**

**Micro HEVs. Mikro HEV imaju** ograničene prednosti uštede goriva od neaktivne stop-start tehnologije, ali i dalje štede na gorivu u poređenju sa vozilima samo na benzin. Ova vozila ne zahtjevaju od proizvođača da redizajnira ceo pogonski sklop, tako da je cijena vozila slična vozilu na gas. Mikro HEV EV nisu sposobni za regenerativno kočenje.

Micro HEVs. Micro HEVs have limited fuel-saving benefits from inactive stop-start technology, but they still save on fuel compared to petrol-only vehicles. These vehicles do not require the manufacturer to redesign the entire powertrain, so the price of the vehicle is similar to a gas-powered vehicle. Micro HEV EVs are not capable of regenerative braking.

**Blagi hibrid  
EV**

**Mild  
HEVs**

**2. Mild HEVs. Blagi HEV-ovi** koriste tehnologiju zaustavljanja u praznom hodu, ali također mogu regenerisati električnu energiju kada se zaustavljaju. Neki proizvođači također mogu da koriste režim asistencije pri pokretanju iz zaustavljanja (ali ne pri većim brzinama vozila). Ova vozila, međutim, nisu opremljena za pokretanje vozila koristeći samo električni motor.

2. Mild HEVs. Mild HEVs use idle stop technology, but they can also regenerate electricity when stopped. Some manufacturers can also use start assist mode from stop (but not at higher vehicle speeds). These vehicles, however, are not equipped to drive vehicles using only an electric motor.

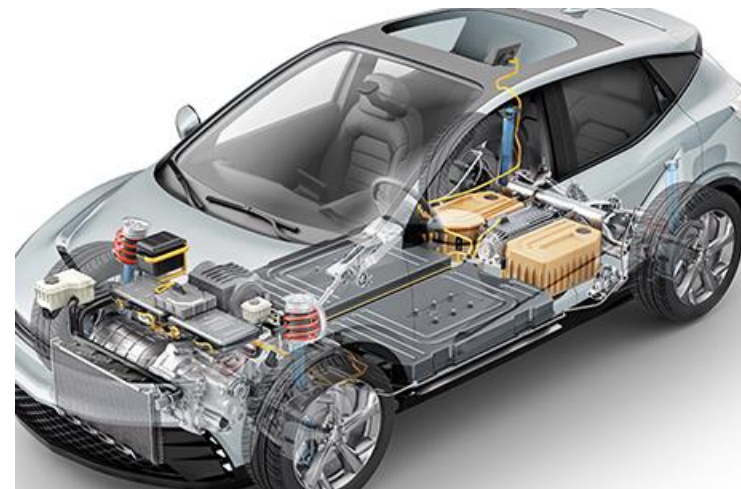


**Puni Hibrid  
EV**

**Full HEVs**

**Puni HEV-ovi** koriste hibridne funkcije vozila – zaustavljanje u praznom hodu, regenerativno kočenje, pomoć pri snazi motora i privremeni rad samo na električni pogon. Potpuni hibridi imaju veće baterije i snažnije elektromotore, koji mogu pokretati vozilo na kratkim udaljenostima i pri malim brzinama.

Full HEVs use hybrid vehicle functions – idle stop, regenerative braking, engine power assist and temporary electric-only operation. Full hybrids have larger batteries and more powerful electric motors, which can propel the vehicle over short distances and at low speeds.

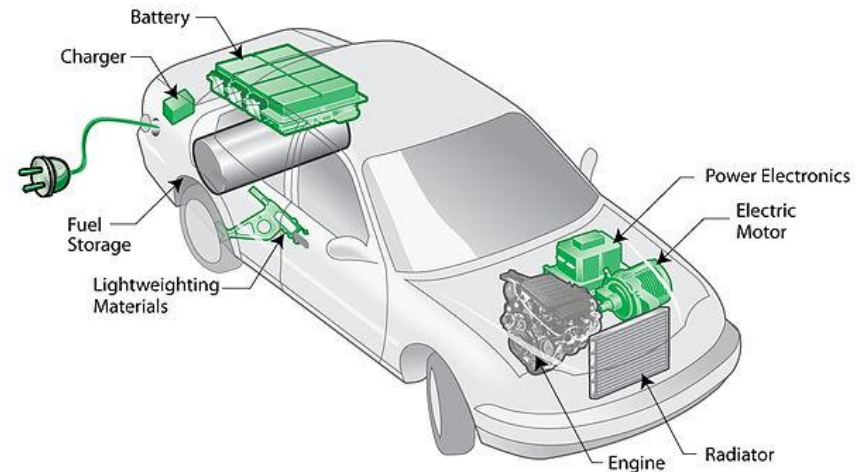


# Plug-In HEVs

# Plug-In HEVs

**4. Plug-In HEVs.** Plug-In HEV-ovi, (PHEV-ovi), koriste iste hibridne funkcije kao i puni HEV-ovi, ali imaju duži domet samo na električni pogon (obično između 40 i 90 km, u zavisnosti od dizajna vozila i njegove baterije). PHEV je napredno hibridno-električno vozilo koje se priključuje na punjač kako bi dopunilo punjenje baterije. Kada se baterija PHEV-a isprazni, motor pomaže u punjenju baterije za nastavak vožnje, što odražava rad punog HEV-a.

4. Plug-in HEVs. Plug-In HEVs, (PHEVs), use the same hybrid functions as full HEVs, but have a longer range only on electric drive (usually between 40 and 90 km, depending on the design of the vehicle and its battery). PHEV is an advanced hybrid-electric vehicle that plugs into a charger to recharge the battery. When the PHEV battery runs out, the motor helps charge the battery to continue driving, reflecting the operation of a full HEV.



Top 10 best electric  
cars 2024

1. Hyundai Kona Electric
2. MG4
3. BMW i4
4. Tesla Model 3
5. BMW iX
6. Porsche Taycan
7. BYD Atto 3
8. Citroen e-C4 & e-C4 X
9. BMW i5
10. Hyundai Ioniq 5

1. Hyundai Kona  
Electric



2.  
MG4



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Thank you for your attention

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