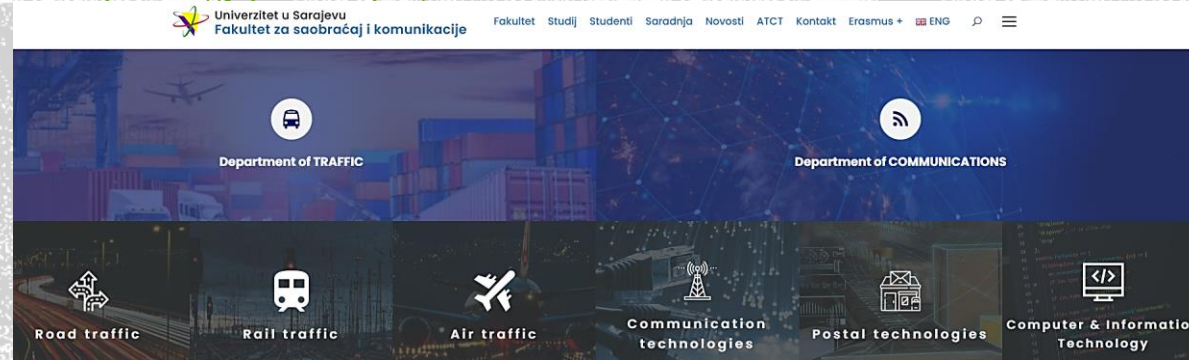


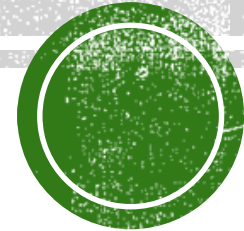


University of Sarajevo: <https://www.unsa.ba>  
Faculty of Traffic and Communications:



**STAKEHOLDERI I GRAĐANI U PROMOCIJI E MOBILNOSTI**

**STAKEHOLDERS AND CITIZENS IN THE PROMOTION OF E-MOBILITY**



Elektromobilnost – poznata i kao e-mobilnost – načelo je korištenja električnog pogona za širok raspon vrsta prijevoza. To uključuje automobile, autobuse, kamione i terenska vozila, kao i brodove, trajekte i druga pomorska plovila.

Electromobility – also known as e-mobility – is the principle of using electric propulsion for a wide range of modes of transport. This includes cars, buses, trucks and off-road vehicles, as well as ships, ferries and other naval vessels.



Glavni izazovi	Main challenges
Battery	
Infrastructure	
Energy for electromobility	
Administrative obstacles	 



## Izazovi koji su pred nama /The challenges ahead

Stabilnost i punjenje  
Stability and charging



Industrijski i građevinski strojevi  
Industrial and construction  
machinery





## MISIJA

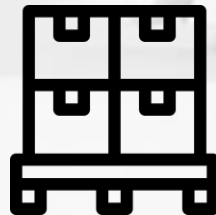
**EVO** projekt rezultat je naših ambicija da **riješimo** probleme ne samo isporuke **zadnje milje**, već i dostave **zadnjeg metra**, **prometne gužve**, **emisije CO2**, isporuke **velikim kamionima** u urbanom okruženju i smanjimo ovisnost **vozača kamiona s licencom**

**EVO** project is the result of our ambitions to solve the problems not only of last-mile delivery, but also of last-meter delivery, traffic jams, CO2 emissions, delivery to large trucks in an urban environment and reducing the dependence of licensed truck drivers

Prometne gužve



Dostava EURO palete u uske prostore



CO2 emisija



Vozači kamiona sa licencom



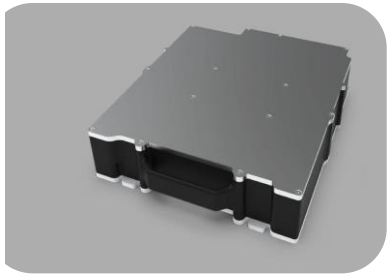
YOU DRIVE.  
YOUR BUSINESS.







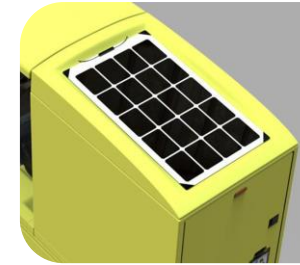
Intuitive apps for drivers



Removable Li-Ion battery, charging time 5 hours that ensures autonomy up to 100km



Noise less hub motors



120W solar panel that provides continuous simultaneous battery charging

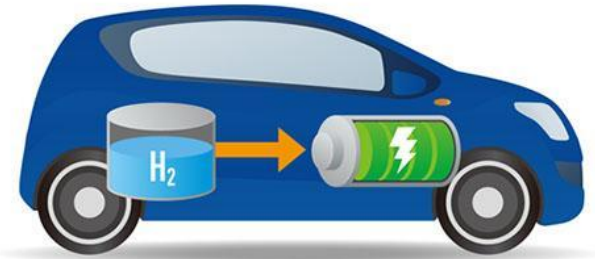


Cargo compartment compatible for euro pallet



Steps for the future

### Hydrogen propulsion



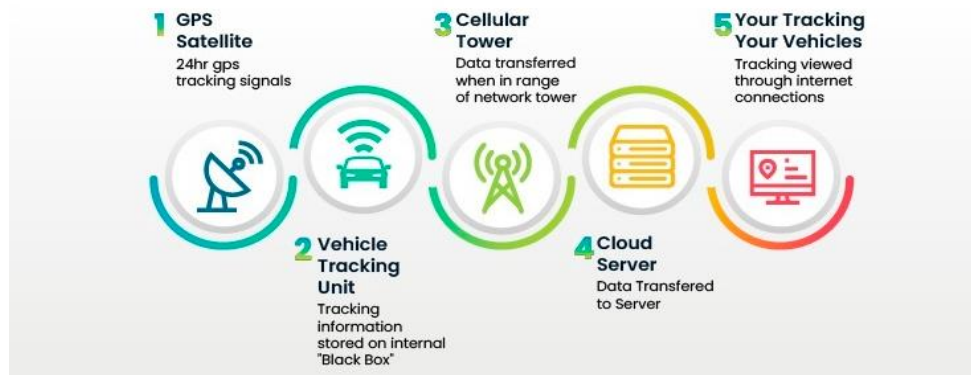
- Higher capacity
- Faster charging
- Light weight
- Flexibility
- High temperature range

### Batteries with graphene



### Biodegradable materials

### AI platform

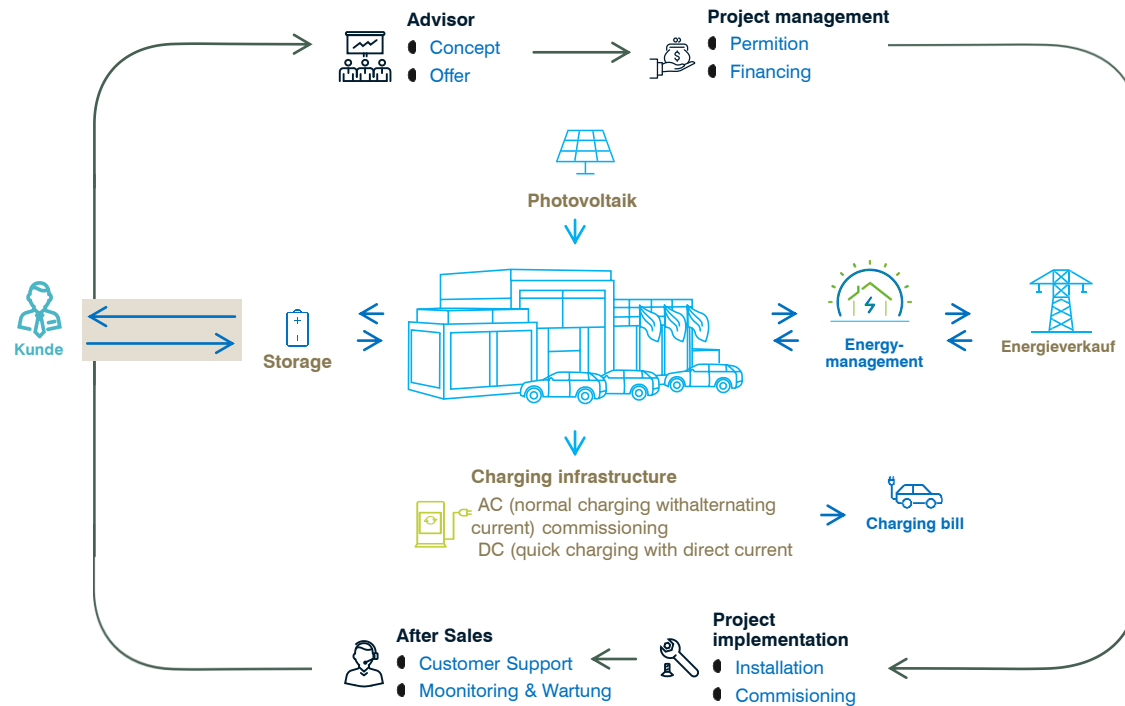


# EV infrastruktura – E punjenje

# EV infrastructure – E charging

Centralni kontakt za cjelokupni energetski koncept i rješenja za punjenje

The central contact for an overall energy concept and charging solutions



**Hardware**  
Our future-proof hardware solutions cover your energy needs of tomorrow, today.

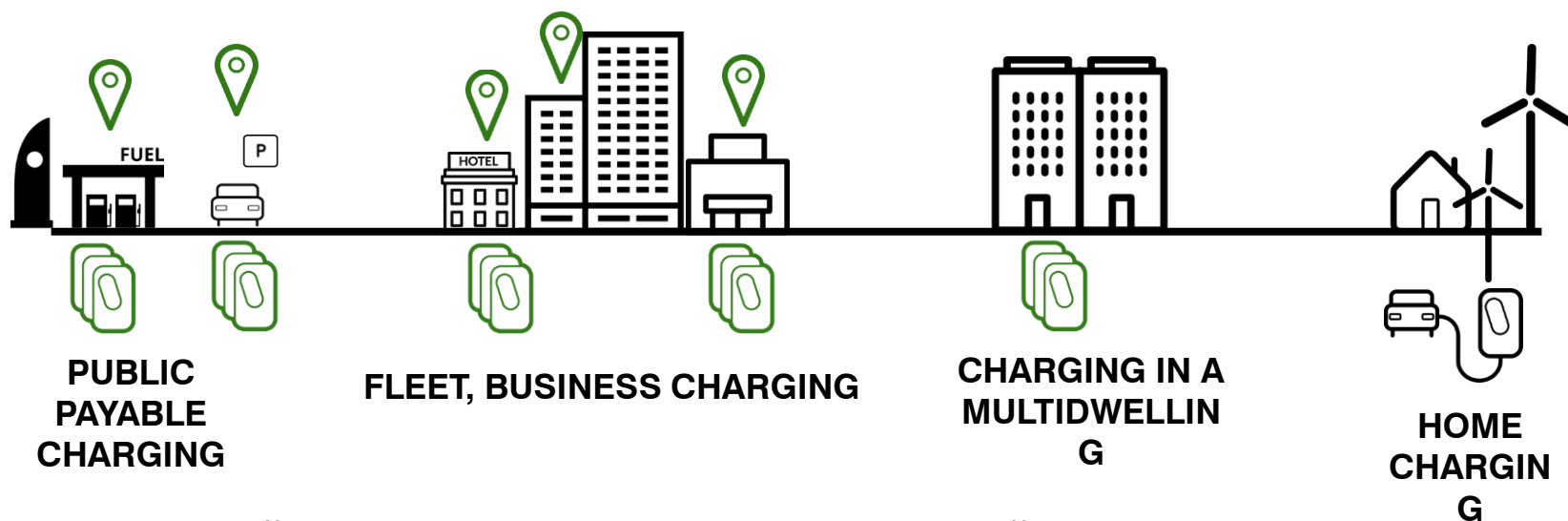
**Software**  
Our software solutions optimise, monitor and control our MOON products.

**Services**  
MOON POWER offers the complete spectrum of e-mobility, individually adapted to your needs.



Različiti biznis modeli, postavka, lokacije, modeli punjača

Different business models, settings, locations, charger models



Korisnici očekuju konzistentnost u iskustvu korištenja , bez obzira na lokaciju

Users expect consistency in the experience of use, regardless of location



Jedan fleksibilan alat koji podržava nekoliko scenarija punjenja

One flexible tool that supports several charging scenarios



## Pregled modela: upravljanje imovinom

## Model Overview: Asset Management

### IMOVINA

- Konfiguracija opreme za punjenje i upravljanje mrežom
- Baza podataka opreme za punjenje
- Trenutno podržano više od 60 modela stanica za punjenje, nove se mogu integrisati na zahtjev.

### MONITORING I KONTROLA

- Praćenje mreže punjenja
- Pregled procesa punjenja
- Statistika punjenja

### PODRŠKA

- Centar za podršku
- OTA nadogradnje
- Daljinsko rješavanje problema
- Upravljanje projektima održavanja

### ASSETS

- Configuration of network charging and management equipment
- Database of filling equipment
- Currently supported more than 60 models of charging stations, new ones can be integrated on demand.

### MONITORING AND CONTROL

- Charging network monitoring
- Overview of the filling process
- Filling statistics

### SUPPORT

- Support Center
- OTA Upgrades
- Remote troubleshooting
- Maintenance Project Management

## Proces i ciklus kretanja

## The process and cycle of customer movement

CRM kupca

- Upravljanje korisnicima
- Upravljanje rezervacijama
- Ugovori i saglasnosti
- Praćenje korisnika i statistika

OBRAČUN I PLAĆANJE

- Postavite tarife na temelju različitih kriterija
- Postavite pružatelje usluga plaćanja
- Fakturisanje
- Praćenje sesije
- Praćenje transakcija

- Podržani načini plaćanja:
- PayAsYouGo i Ad-hoc plaćanje
- Plaćanje unaprijed
- Post plaćanje
- Pretplata (ponavljajuće plaćanje)

MARKETING

- Generisanje promocija na lokaciji
- Upravljanje i distribucija kupona
- Push obavijesti

CRM

- Managing users
- Managing reservations
- Contracts and consents
- User tracking and statistics

CALCULATION AND PAYMENT

- Set plans based on different criteria
- Set up payment providers
- Invoicing
- Session Tracking
- Transaction Tracking

- Supported payment methods:
- PayAsYouGo and Ad-hoc payment
- Prepayment
- Post payment
- Subscription (recurring payment)

MARKETING

- Generating promotions at the site
- Managing and distributing coupons
- Push notifications

## Pregled modula: dodatne

### usluge

#### **ROAMING**

- Podrška za roaming s najvećim roaming platformama
- Hubject
- Gireve
- eClearing
- Digitalna rješenja za punjenje (DCS)
- Brzi Intra-Ocean roaming
- Direktni P2P roaming (OCPI)

#### **UPRAVLJANJE**

- Upravljajte velikim klasterima mješovitih stanica za punjenje

#### **NAPAJANJE**

- Napajanje Upravljanje područjima opterećenja
- Upravljanje DSO zahtjevima

#### **UPRAVLJANJE**

- Dodijelite pristup podoperateru
- Dodijelite timske uloge

#### **PRISTUPOM**

- Outsource (npr. 24/7 služba za pomoć)

#### **ANALITIKA**

- Pratite performanse mreže
- Generirajte prilagođene izvještaje s opcijama izvoza podataka

## Module overview: additional services

#### **ROAMING**

- Roaming support with the largest roaming platforms
- Hubject
- Gireve
- eClearing
- Digital Charging Solutions (DCS)
- Fast Intra-Ocean Roaming
- Direct P2P roaming (OCPI)

#### **POWER MANAGEMENT**

- Manage large clusters of mixed charging stations
- Power Supply Management Load Areas
- Managing DSO requirements

#### **ACCESS MANAGEMENT**

- Grant suboperator access
- Assign team roles
- Outsource (e.g. 24/7 helpdesk)

#### **ANALITIKA**

- Monitor network performance
- Generate custom reports with data export options

## USLOVI VEZANI ZA KORIŠTENJE PUNIONICE – READINESS CHECK LIST

P	PARTNER CHECK LIST	TYPE OF OBLIGATION
1	Vlasnik punjača / Charger owner	Mandatory
2	Zemljište za postavljanje punjača / Land for installing chargers	Mandatory
3	Trošak priključka struje / The cost of electricity connection	Mandatory
4	Instalacija / Installation	Mandatory
5	Održavanje / Maintenance	Required in warranty
6	Osiguranje, video nadzor / Security, video surveillance	Mandatory
7	Caffe i snack mašina, Toilet / Coffee and snack machine, Toilet	Desirable
8	Internet (M2M, SIM, Wifi, Intranet)	Mandatory
9	Call Center (Help Desk)	Mandatory
10	Sistem za naplatu (backend-solution)	Mandatory
11	Dizajn i uređenje lokacije za punjenje / Design and arrangement of the filling site	Mandatory
12	Ugovor o saradnji 5 godina / Cooperation agreement for 5 years	Mandatory
13	Dijeljenje profita / Profit sharing	Mandatory
14	Marketing podrška / Marketing podrška	Mandatory



Example of charger analysis - Porsche  
Sarajevo

## ANALYSIS OF THE USE OF DC CHARGERS 150 KW

P	Description	Values
1	Energy consumption (MW)	30
2	No of sessions	1.200
3	Average /per session (kW)	25
4	Purchasing power 0,2 EUR/kW	3.000
5	Sales price 0,6 EUR / kW	18.000
6	<b>Gross Profit (BGW in EUR)</b>	<b>15.000</b>




Communication protocol of the ocpp charging infrastructure 1.6

Komunikacijski protokol infrastrukture za punjenje OCPP 1.6



# Example of options on backend code

## CPO



Porsche BIH

- Navigation history
- Infrastructure dashboard
- Charging sessions**
- Manage user access
- Support
- My fleet

Language Log out

### Charging report basic

**Charging sessions**

Charging from

Charging to

Status

✕ Reset filter
🔍 Search
⌵ More options
📄 Export to csv

Number of results: 24 Previous 1 Next

Session ID	Location	Charge point	Status	Charging time	Consumed energy	Stop reasons	Raw messages	Billing	Payment
S-2024/250 <small>(CdrId: 11121027)</small>	Porsche Sarajevo <small>(Bulevar Meše Selimovića 16, 71000 Sarajevo)</small>	EPBIH-0021-01 Connector: 2 <small>(CCS plug)</small>	Charging has started	24.01.24. 16:57:57			Raw messages		
S-2024/249 <small>(CdrId: 11120375)</small>	Porsche Sarajevo <small>(Bulevar Meše Selimovića 16, 71000 Sarajevo)</small>	EPBIH-0021-01 Connector: 2 <small>(CCS plug)</small>	Charging finished normally	Duration: <b>00:30:27</b> 24.01.24. 16:25:06 24.01.24. 16:55:33	23,1 kWh	Local stop	Raw messages		
S-2024/248 <small>(CdrId: 11120179)</small>	Porsche Sarajevo <small>(Bulevar Meše Selimovića 16, 71000 Sarajevo)</small>	EPBIH-0021-01 Connector: 2 <small>(CCS plug)</small>	Charging finished normally	Duration: <b>00:08:08</b> 24.01.24. 16:16:29 24.01.24. 16:24:37	7,6 kWh	Local stop	Raw messages		
S-2024/247 <small>(CdrId: 11119584)</small>	Porsche Sarajevo <small>(Bulevar Meše Selimovića 16, 71000 Sarajevo)</small>	EPBIH-0021-01 Connector: 1 <small>(Type 2 socket)</small>	Charging has started	24.01.24. 15:48:35			Raw messages		
S-2024/245 <small>(CdrId: 11118030)</small>	Porsche Sarajevo <small>(Bulevar Meše Selimovića 16, 71000 Sarajevo)</small>	EPBIH-0021-01 Connector: 1 <small>(Type 2 socket)</small>	Charging finished normally	Duration: <b>00:17:37</b> 24.01.24. 14:25:49 24.01.24. 14:43:26	10,2 kWh	Local stop	Raw messages		
S-2024/243 <small>(CdrId: 11116431)</small>	Porsche Sarajevo <small>(Bulevar Meše Selimovića 16, 71000 Sarajevo)</small>	EPBIH-0021-01 Connector: 3 <small>(CCS plug)</small>	Charging finished normally	Duration: <b>00:00:14</b> 24.01.24. 12:59:09 24.01.24. 12:59:23		Local stop	Raw messages		
S-2024/242 <small>(CdrId: 11115735)</small>	Porsche Rajlovac <small>(Rajlovačka bb, 71000 Sarajevo)</small>	EPBIH-0022-02 Connector: 1 <small>(Type 2 plug)</small>	Charging finished normally	Duration: <b>03:04:23</b> 24.01.24. 12:19:43 24.01.24. 15:24:06		EV disconnected	Raw messages		



## Proces prijave za pružaoca usluga punjenja e-vozila prema FERK

Prilikom formiranja cijene voditi računa o sljedećim parametrima:

- Iznos nabavke punjača (povrat investicije),
- ulaznu cijenu električne energije (osnova za naplatu),
- povećanje angažovane-vršne snage (obvezna stavka za sve pružaoce usluga),
- obezbjeđenje parking prostora (često se zaboravlja uzeti u obzir)
- Definisane penaliziranja u slučaju dužeg zadržavanja na punjaču i itd.

Napomena: voditi se principima transparentnosti, utvrđenih tržišnih cijena, nediskriminacije, iskazati u formi javno objavljenog cjenovnika svakodobnim korisnicima predmetnog punjača;

Trenutno naša utvrđena jedinična cijena punjenja električnih vozila iznosi 0,80KM sa PDV-om po utrošenom kWh;

## Application process for e-vehicle charging service provider according to FERK

When forming a price, take into account the following parameters:

The amount of purchase of chargers (return on investment),  
the input price of electricity (basis for charging),  
increase of the engaged-peak power (obligatory item for all service providers),

Parking space (often forgotten to consider)

Definition of penalization in case of prolonged detention on the charger and etc.

Note: be guided by the principles of transparency, established market prices, non-discrimination, express in the form of a publicly disclosed price list to the users of the charger in question at any time;

Currently, our established unit price of charging electric vehicles is 0.80KM including VAT per kWh consumed;





University of Sarajevo: <https://www.unsa.ba>  
Faculty of Traffic and Communications:  
<https://fsk.unsa.ba/>



**PhD. Osman Lindov, Full Professor-Traff. Eng.**

Faculty of Traffic and Communications University of Sarajevo  
Zmaja od Bosne 8, 71 000 Sarajevo, B&H  
Phone: +387 (33) 565 200 / Mobile: + 387 (61) 161 482

Thank you for your attention

Osman Lindov: [osman.lindov@fsk.unsa.ba](mailto:osman.lindov@fsk.unsa.ba)

Amel Kosovac: [amel.kosovac@fsk.unsa.ba](mailto:amel.kosovac@fsk.unsa.ba)

Drago Ezgeta: [drago.ezgeta@fsk.unsa.ba](mailto:drago.ezgeta@fsk.unsa.ba)

Adnan Omerhodžić: [adnan.omerhodzic@fsk.unsa.ba](mailto:adnan.omerhodzic@fsk.unsa.ba)

Belma Memić: [belma.memic@fsk.unsa.ba](mailto:belma.memic@fsk.unsa.ba)

Elma Avdagic-Golub: [elma.avdagic@fsk.unsa.ba](mailto:elma.avdagic@fsk.unsa.ba)

Aida Kalem: [aida.kalem@fsk.unsa.ba](mailto:aida.kalem@fsk.unsa.ba)

Edvin Šimić: [edvin.simic@fsk.unsa.ba](mailto:edvin.simic@fsk.unsa.ba)

Ajdin Džananović: [ajdin.dzananovic@fsk.unsa.ba](mailto:ajdin.dzananovic@fsk.unsa.ba)

