



E-MOBILITY IN THE CZECH REPUBLIC IN THE LIGHT OF „FIT FOR 55“ PACKAGE

OPPORTUNITIES AND CHALLENGES FOR ENERGY
TRANSFORMATION IN CENTRAL EUROPE

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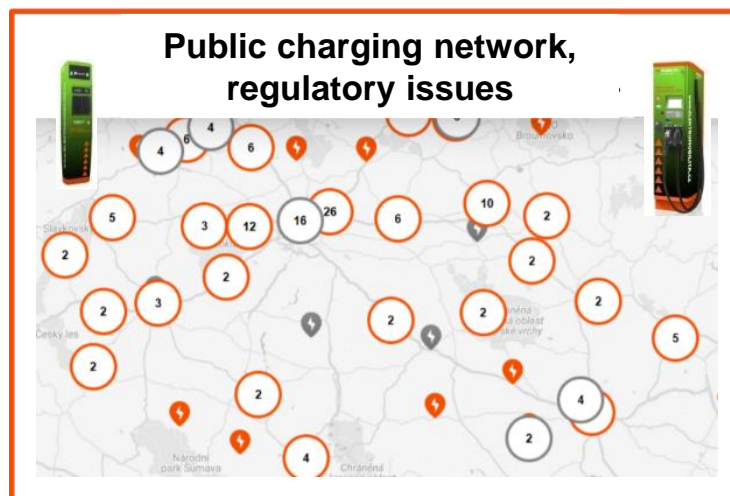
ČISTÁ
ENERGIE
ZÍŤŘKA...



CEZ GROUP IS ACTIVE IN ALL SEGMENTS OF E-MOBILITY MARKET



CEZ



CEZ ESCO

B2B segment and Public transport

Centrální Systém
KOMUNIKACE & DATA
Data online ze všech prvků systému do centrálního cloudu, agregace & analýtika & management & aplikace

DOBÍLEČNÍ STANICE
Doporučení vhodných dobíjecích stanic dle možností a preferencí zákazníků, včetně jejich dobavy, instalace, připojení a provozu.
• umístění: uvnitř i venku
• pomalé (AC) i rychlé (DC)
• umístěné na zeď i sloupky
• jedna nebo i více lokality

ELEKTROMOBILY
Nabídka elektromobilů všech kategorií vč. eBusů s možným zajištěním finanční formou operativního leasingu, jednotlivé i celé flotily, včetně poradenství jak nejlépe začlenit elektromobil v rámci stávající flotily...

CEZ Prodej

B2C segment and retail customers

Centrální aplikace
Centrální aplikace napojené na systém CEZ online umožňuje vizualizaci prvků svého technologického systému.

Čiřtý termostát a další technologické vybavení budov pro získání maximální úspory. Díky těmto budovám lze využít energii při vytopění v energi úhledně.

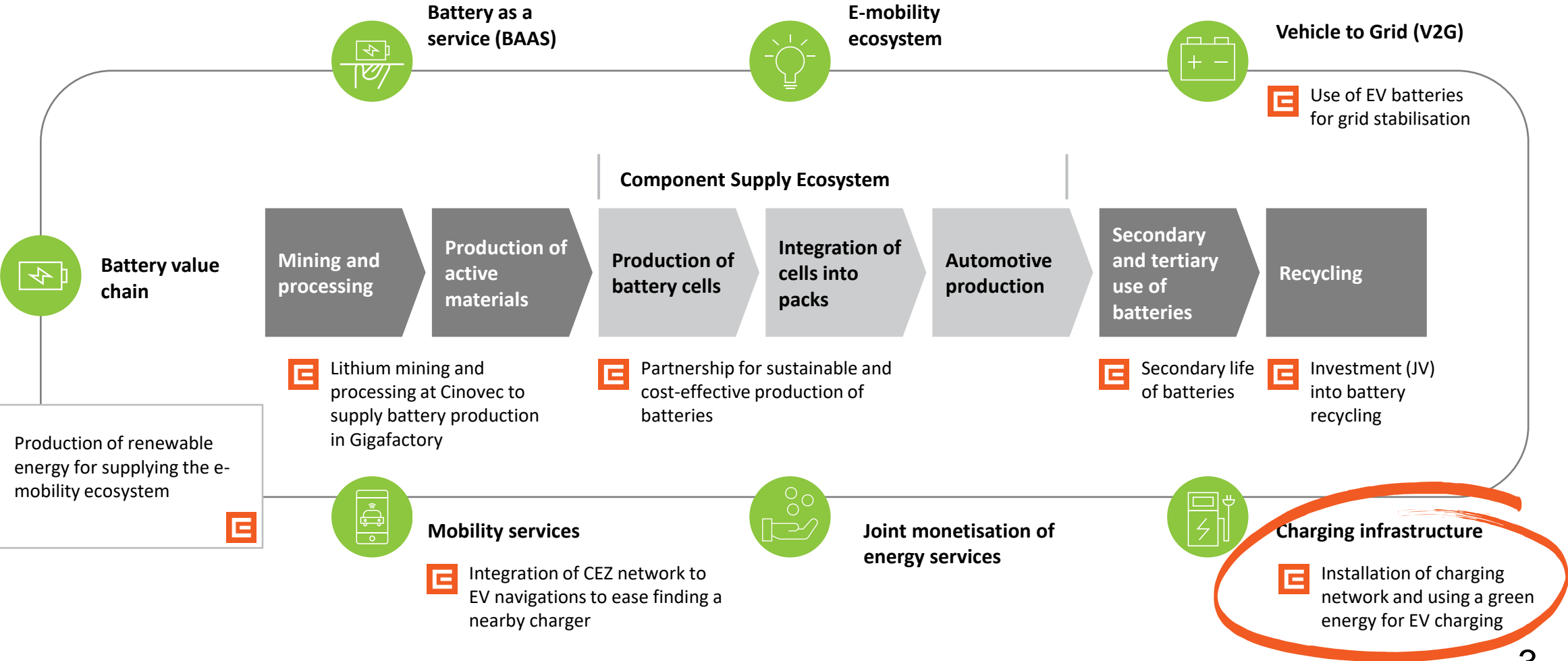
Díky novým technologiím budeme moct rozšířit nabídku elektromobilů jako zdroj energie při pro domácnost, tak pro městské.

TADO®
Wallbox
Battery Box
Vytápění
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FIT panely

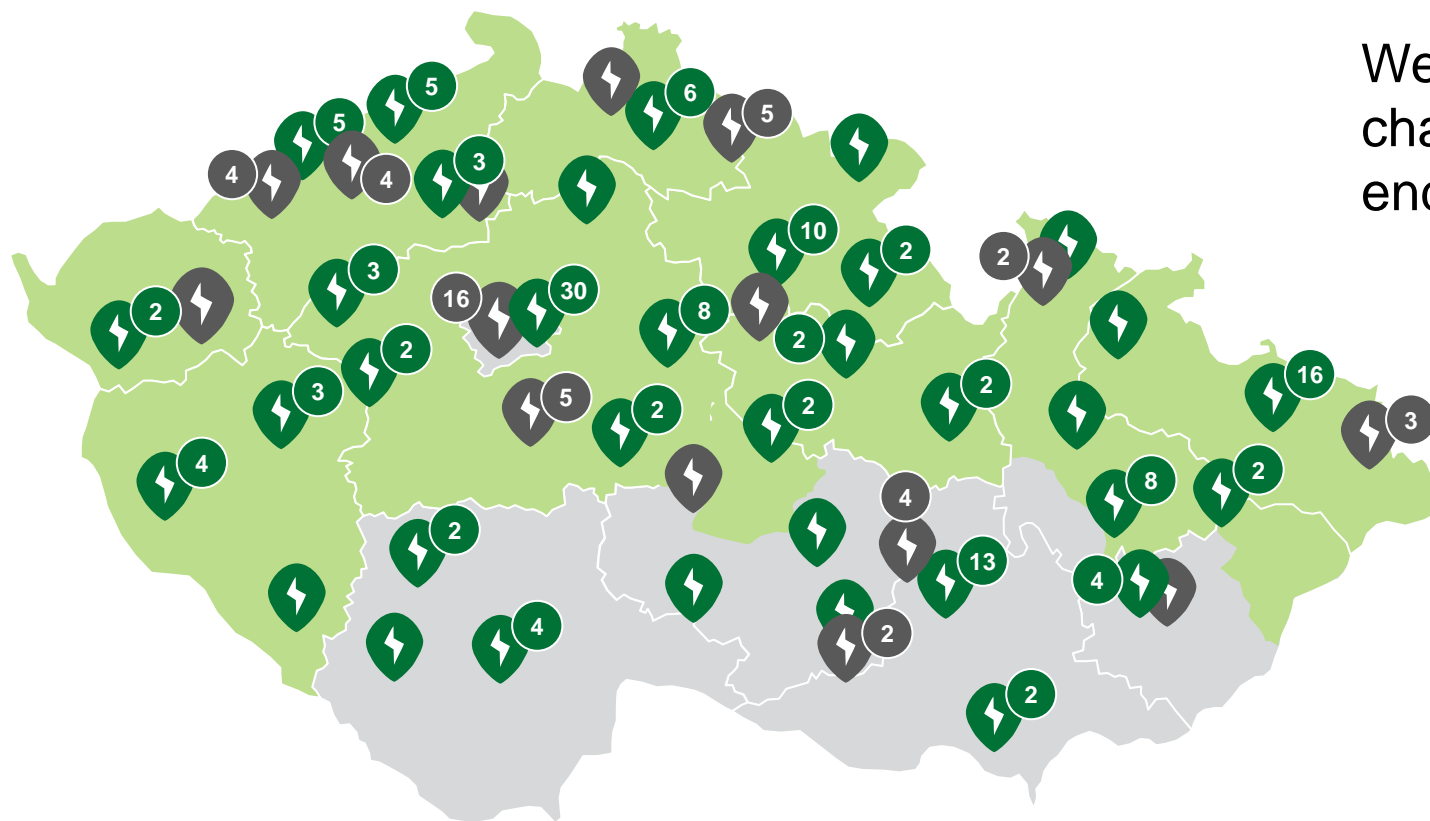
Technologie Peer to peer (P2P) bude základem komunity pro obchod mezi klienty v CEZ Prodej.

Problém: "Chci být pro domácnost" není smysl pro zákazníky, kteří chtějí být dobíjecí stanic, tak dobíjecí stanic.

CEZ GROUP IS EXPANDING ITS ACTIVITIES IN BATTERY AND E-MOBILITY BUSINESS



PUBLIC CHARGING NETWORK IS ESSENTIAL PART OF OUR ACTIVITIES, EXPANSION WILL CONTINUE



We have intensified installation of new chargers and expect to operate by the end of 2021:



More than **300 DC** charging stations



More than **70 AC** chargers

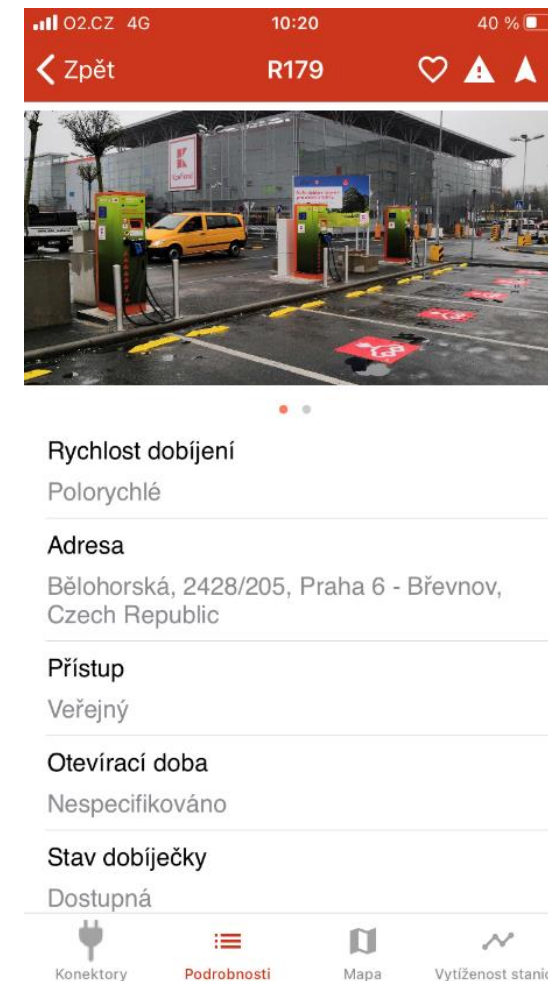
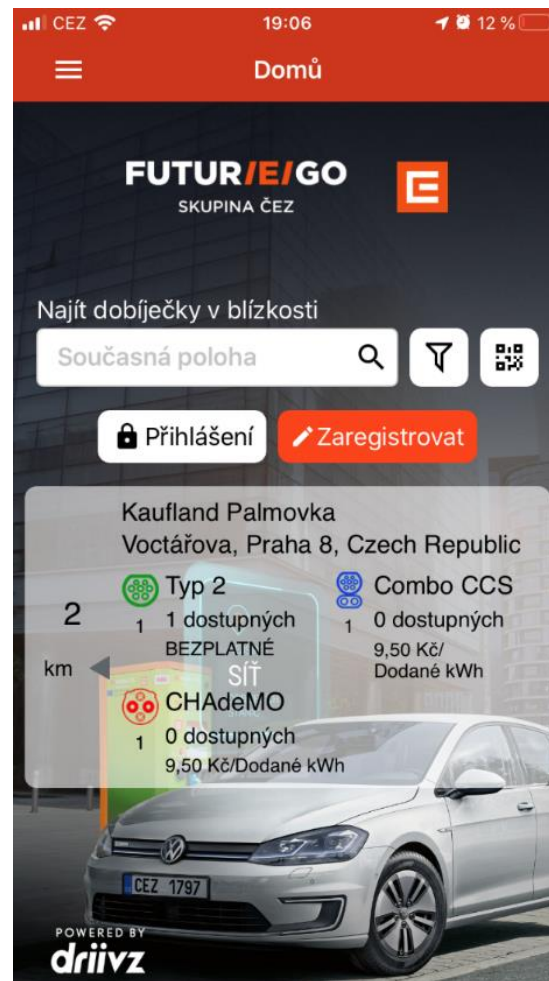
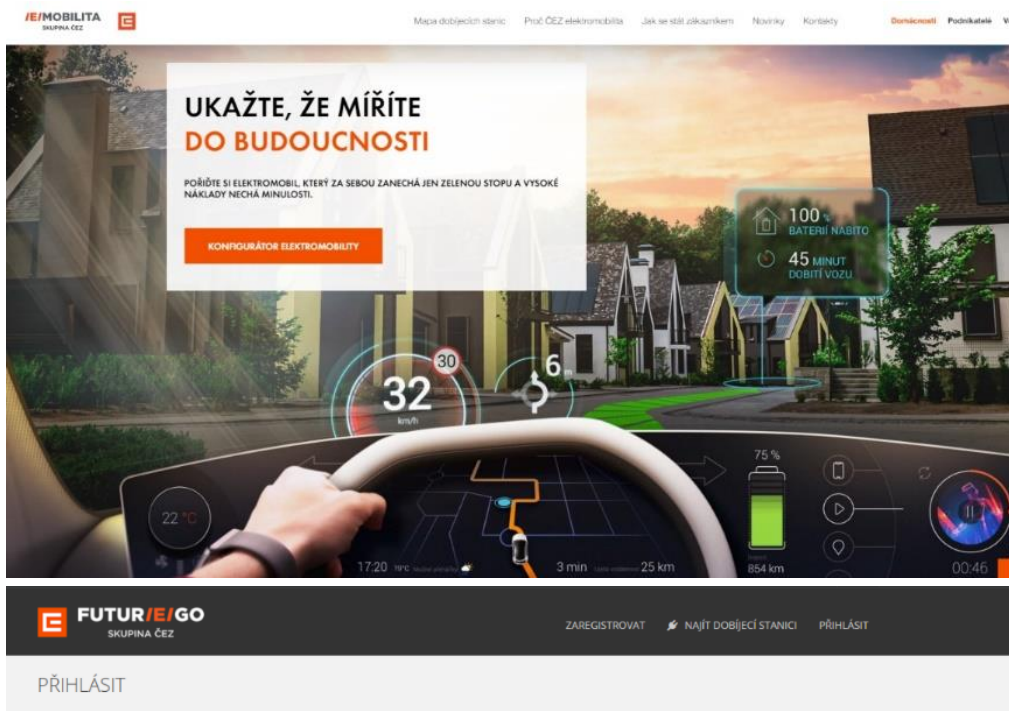


More than **3 GWh** supply of electricity for charging in our network

CEZ aims to develop a **backbone of DC and HPC charging** network across the country.



DRIVERS ARE MANAGED BY SOPHISTICATED AND USER-FRIENDLY INTERFACE, IT BACK-END SYSTEM WILL BE UPGRADED TO PRESENT NEW FUNCTIONS AND PRODUCTS



E-mail

Heslo

Pamatovat si mě

Zapomněli jste heslo?

Přihlásit

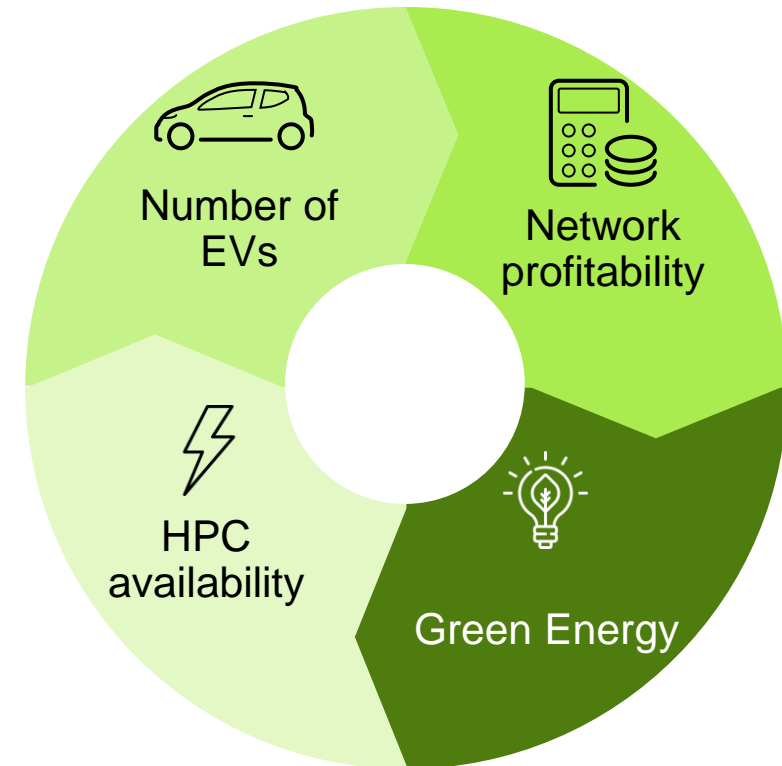
THE KEY ELEMENT OF SUCCESSFULL E-MOBILITY DEVELOPMENT IS A DENSE NETWORK OF UP-TO-DATE CHARGING STATIONS



ČEZ development strategy

- ČEZ will focus on DC charging, with growing share of HPC
 - First HPC (150+ kW) already installed as pilots
 - Battery storage (together with RES) will play a more important role when developing charging hubs
 - AC charging will play its role mainly in non-public or residential locations
- ČEZ e-mobility targets:
 - More than 800 chargers by 2025
 - Significant share of HPC
 - Up-To-Date network with efficient management and optimization
 - Maximal use of green electricity for charging

eMobility ecosystem



CHARGING HUBS HAVE POTENTIAL TO BECOME PILLARS OF PUBLIC NETWORK, TARGETING MAINLY TRANSIT DRIVERS



HUB definition

- Location with higher number of charging points (at least 10) in parallel
- Optimised grid connection and power management capabilities

Preconditions of successful HUB

- Attractive for drivers – low risk that all chargers will be occupied
- Chargers with different power outputs/power sharing can be combined
- Charging hub can be gradually upgraded to offer higher number of charging points and/or higher power



Phase 1	→	Phase 2	→	Phase 3
<ul style="list-style-type: none">▪ 2x 150 kW▪ 8x 50 kW▪ 8x 22 kW		<ul style="list-style-type: none">▪ 6x 150 kW▪ 4x 50 kW▪ 4x 22 kW		<ul style="list-style-type: none">▪ 2x 300 kW▪ 4x 150 kW▪ 4x 50 kW▪ 4x 22 kW
Total 870 kW		Total 1180 kW		Total 1480 kW

OUR AMBITION IS TO KEEP THE LEADING POSITION ON THE CZECH MARKET



Our strategy is built on three main pillars:

Good coverage and charging hubs

- **CEZ aims to contribute to fulfil the „Fit for 55“ infrastructure targets**
- Comfortable solution for drivers – accessibility, on-site activities
- **Minimal risk** of waiting for available connector
- **Acquisition of locations for charging hubs**

„Up-to-date“ charging technology

- Focus on power upgrade and HPC charging
- In case of sufficient demand, installation of chargers with 300+ kW of power output
- Plans to develop charging for heavy duty vehicles according to EU plans
- Flexibility in upgrading the existing network depending on demand and market development

Efficient operation and customer management

- Sophisticated HW/SW tools for optimised operation of locations (grid connection)
- Possibility to connect local RES production
- Robust fleet management tools
- Interoperability and roaming
- Optimised tariff structure

„FIT FOR 55“ PACKAGE, PUBLISHED IN JULY 2021, INCLUDES TARGETS FOR PUBLIC TRANSPORT



TARGETS FOCUS NOT ONLY ON PASSENGER VEHICLES, BUT ALSO ON HEAVY TRANSPORT, WITH TARGETS BOTH ON VEHICLES AND INFRASTRUCTURE COVERAGE



National fleet based targets for charging stations for cars and vans – those could lead to approximately*:



*according to Commission Impact Assessment of vehicle uptake following the 'Fit for 55' proposals and assuming an average power output of approx. 15kW per recharging station



Recharging pools for cars and vans

- on the TEN-T core network: at least 300kW power output every 60km by 2025 and at least 600kW by 2030;
- on the TEN-T comprehensive network: at least 300kW power output every 60km by 2030 and at least 600kW by 2035.



Hydrogen refuelling stations

- will be made available every 150km by 2030 along the TEN-T core network;
- in every urban node serving both light duty and heavy duty vehicles by 2030.



Recharging points for heavy duty vehicles

- on the TEN-T core network: at least 1400kW of recharging points every 60km by 2025 and at least 3500kW by 2030;
- on the TEN-T comprehensive network: at least 1400kW power output every 100km by 2030 and at least 3500kW by 2035;
- in every urban node and at every safe and secure parking by 2030.

WHEN DEVELOPING THE NETWORK, SOME PARAMETERS ARE DIFFICULT TO PREDICT, ESPECIALLY RELATED TO DRIVER BEHAVIOUR OR REGULATION



Longer range = higher utilisation of public network?

- Longer range (higher capacity of the battery) means:
 - a) **Higher probability that driver will return back home** and will use public chargers only for transit journeys? (= lower interest in public charging and only in HPC)
 - b) **Will not be interested into increasing level of circuit breaker** and slow charging will not be sufficient for comfort charging (= higher interest in public charging across charger types)

Willingness to pay

- **Higher power = Higher costs = Higher price**
- Is even more significant in case of low utilisation
- EV drivers request dense network with as much powerful chargers as possible
- Even those drivers whose cars are not capable to use such power...kind of „high-power charger fetishism“?
- **Will the preference change in case significant process difference** for 50 kW x 150 kW x 300 kW ?

Heavy duty vehicles

- According to „Fit for 55“ a quite important topic (at least based on infrastructure requirements)
- Heavy vehicles charging will work differently than for passenger cars (both technically and operationally)
- **What will be the role of logistic companies and heavy vehicles operators in charging?**

THE FOLLOWING KEY CHALLENGES MUST BE RESOLVED TO ACHIEVE A DYNAMIC INCREASE OF PUBLIC AND PRIVATE CHARGING POINTS



Permitting process

- Czech Republic's permitting process is one of the longest in the world:
 - Permitting process itself is necessary to avoid any chaos in building at public areas
 - But its implementation is uncoordinated, unnecessarily complex and highly dependent on quality of human resources
- It takes 1,5-2 years on average to develop a new site
- Process is doubled (DSO part for grid connection, our part for the charger itself)

Access to public locations

- Number of attractive locations is owned by public authorities and municipalities (such as highway rest areas, public places)
- Requirements and processes to get a contract for the location are enormous, often without a success after 1-year of effort
- Absence of strategy or at least clear rules
- It is so far much easier to find agreement with private owners (they have a clear motivation), but potential of locations is limited

Fire safety requirements

- Absence of EU-coordinated rules for fire safety requirements of charging inside the buildings (but also outside)
- Czech Fire-fighting authority is proposing own rules which in case they are applied as proposed, will significantly reduce potential of indoor installations
- Potential conflict with requirements of other legislation (energy efficiency of buildings directive) and ambitious country targets for chargers as well as adoptions by people who have parking inside

E-MOBILITY DEVELOPMENT IS A LONG-TERM TOPIC, IT REQUIRES COOPERATION AMONG ALL STAKEHOLDERS



Key topics

Regulatory framework

- In the light of „Fit for 55“ ambitious targets, the „right“ setup of regulatory framework is essential to be attractive for private investors in charging infrastructure:
 - Ease the access to state-own locations (eg. highways)
 - Easier and faster public funding
 - Keep targets and indicators flexible (is sustainability period helpful?)
 - Seeking the rules that will not create extra burden in cases of low utilization (HV grid tariff policy)
- Other practical issues: tax rules for operation of EV (company/private use), permitting process, fire-related and safety requirements, interoperability and roaming

Complex e-mobility ecosystem

- It is essential for CZ to keep the contact with latest technologies and activities with high added value in the whole value chain, R&D and education

Municipalities

- Seek for the effective role of municipalities, such as residential charging which is not commercially attractive (charging as a public service)

Public

- Low-emission mobility and alternative fuels are complex topics, permanent communication towards wider public is necessary to help general understanding how new technologies can help in improving the environment and quality of life



OUR VISION OF E-MOBILITY MARKET IN 2030



Market

- Hundreds of thousand vehicles on the roads
- Process of charging generate necessary margins but is still attractive for drivers
- E-mobility is quite common across road transport segments, including mass transport and heavy vehicles

Charging infrastructure

- High-power charging hubs available across the country to allow for transit travelling
- Medium-power charging stations available in sufficient numbers at POIs, shopping centres
- High number of low-power charging points for long-term/overnight charging – parking lots, streets, companies
- Gradual consolidation of CPOs
- Due to combination of measures, DSOs are able to absorb the EV charging

Interoperability and roaming

- Roaming and interoperability will become natural standard
- New technologies will make charging even easier (autocharge)
- Highly competitive market of MSPs
- V2G becoming a technology standard



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