E-MOBILITY @ CROATIAN TELECOM

Workshop on Sustainable Energy Use in Transport and Public Cectors in South East Europe

November 14th, Vienna

LIFE IS FOR SHARING.
CROATIAN TELECOM AT A GLANCE

- Largest telco and convergent services (ICT, IPTV, Data & Electricity) provider in Croatia
- 2.2 mio mobile & 1.1 mio fix customers
- 51% owned by Deutsche Telekom AG
- 1.6 bil EUR market cap as of 9/2016
- Leader in digitalization of IoT national wide
- Forerunner in e-mobility B2B2C ecosystem development within Adriatic region (since 2012)
THE CHALLENGE

Did you know that growth of e-mobility market, on the level of infrastructure deployment and service provisioning will grow 10 times till 2020, reaching 5 bil EUR market size across EU footprint? How to position within it and create sustainable & viable business model out of it? It remains the challenge, which is now mastered with advanced Smart e-Mobility B2B2C Solutions developed and marketed by Croatian Telecom (CT).

**B2C**
- To have a sufficient and reliable infrastructure in place, always and everywhere
- Simple instructions for usage
- Simplified key for accessing infrastructure
- A single point of contact with service provider
- Interested to share their plug against commercial interest

**B2B**
- To gain additional saving by using EVs & PHEVs
- To get tax relieves against enabled usage of their plugs
- To get advantage of green PR
- To generate new revenues by sharing their plugs to employees/visiting partners

**B2G**
- To help in implementation of EU2020 goals on CO2 reduction and promotion of renewables in transportation
- To take advantage of extremely positive PR associated with EVs
- To generate new revenues by sharing their plugs

Common interest of all customers: Get me involved into e-mobility value chain ASAP!
Our answer & driving moto is:”Charging is for Sharing!”
THE ULTIMATE SOLUTION IS: ALWAYS AVAILABLE & SEAMLESSLY ACCESSIBLE INFRASTRUCTURE WITH AFFORDABLE CHARGING SERVICES

<table>
<thead>
<tr>
<th>Market Demand</th>
<th>Our answer</th>
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<tbody>
<tr>
<td>Charging Infrastructure available always &amp; everywhere</td>
<td>Together with partners, CT already created the largest EV charging network in Croatia and it is expanding beyond the borders by coupling with international roaming platforms</td>
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<tr>
<td>Seamlessly Accessible Infrastructure</td>
<td>CT enabled access with single T-RFID Card, SMS and global mobile APP PlugSurfing</td>
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<td>Affordable services</td>
<td>CT applied dispersed capex model and the solution is vertically integrated, resulting with a lot of synergies and bringing cost of operations heavily down</td>
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For the parking lot owners, the ultimate solution should be a money making machine.
SMART E-MOBILITY SOLUTIONS BY CT ARE DESIGNED FOR SUPERB EV CUSTOMER JOURNEY IN SMART CITIES
IN PURSUING OUR E-MOBILITY VISION "SEAMLESS ACCESSIBILITY, ALWAYS AND EVERYWHERE" WE DEVELOPED AN OPEN ICT ECOSYSTEM THAT CONNECTS INFRASTRUCTURE, VEHICLES AND EV USERS IN REAL-TIME.
Enterprise-level 5 tier open B2BC end-to-end ecosystem represents the core asset base of CT’s e-mobility architecture.
Puni.hr is the largest network of fully integrated EV charging stations in Adriatic region, operated by CT.

- Puni.hr is connected to the regional eRoaming platform that connects 10 different operators and more than 400 EV charging stations at the footprint of Croatia and Slovenia.
CT’S EV CHARGING NETWORK USAGE IS SOARING!

- More than 300,000 green kilometers enabled to EV & PHEV users
- More than 25 tons of CO₂ reduced!
IN SEPT. 2016 PUNI.HR OPENED ACCESS TO PLUGSURFING COMMUNITY ENABLING ACCESS TO MORE THAN 40,000 EV USERS ACROSS EU
BY EOY 2016, PUNI.HR WILL BE COUPLED WITH THE LARGEST EROAMING PLATFORM IN EU – HUBJECT, ENABLING OUR COSTUMERS ACCESS TO EXTRA 5,000 EVCS
**APPLIED IS INCLUSIVE BUSINESS MODEL!**

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<tr>
<th>EV Charger Owner</th>
<th>Operator of EV Charging Network</th>
<th>Service Provider(s)</th>
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<tbody>
<tr>
<td>Parking Lot Owner/Charge Point Operator</td>
<td>Telekom</td>
<td>Parking Lot Owner/Charge Point Operator/Others</td>
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### Rights/Responsibilities

- **EV Charger Owner**
  - Determines rights of access to EVCs (technical and commercial terms)
  - Responsible for EVC usage monitoring and future investments planning
  - Local e-mobility promotion

- **Operator of EV Charging Network**
  - Provides EVC operations & technical support 24/7
  - Continuous update of software package
  - Emergent and regular maintenance of EVCs
  - National/regional e-mobility promotion

- **Service Provider(s)**
  - Determines end user term sheets
  - Provides charging services
  - Provides customer support
CREATING BUSINESS MODEL IN PRACTICE

T-Ocean EVC Backend
(Control center)

EVC Owner
(owner of parking lot)

T-Ocean EVC Backend
(Control center)

Energy flow
Communication flow
Cash flow

EVC Owner
(owner of parking lot)

RFID
SMS
APP

eRoaming platform

DISTRIBUTION

TRANSMISSION

GENERATION

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<th>ITEM/STEP</th>
<th>Description</th>
<th>CT’s role</th>
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<tr>
<td>1. Advisory &amp; Engineering Services</td>
<td>Includes: preliminary and main project design, as well as EU/national and funding application.</td>
<td>Provides advisory services related to project documentation development.</td>
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<td>2. Electricity &amp; Construction Works</td>
<td>Includes: ensuring sufficient electric power, depositing power and communication cables, foundation design and arranging parking lot designation.</td>
<td>Provides advisory services on specifications, procedures and coordinates contractor selection.</td>
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<tr>
<td>3. Grid Connection &amp; Electricity Supply</td>
<td>Where possible, take advantage of the existing connection and power supply plan.</td>
<td>Provides advisory services on electricity plan selection.</td>
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<td>4. EV charging station commissioning</td>
<td>Pursued after preliminary mandatory work is done by investor at the site.</td>
<td>Delivers EVC according to selected specifications.</td>
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<td>5. Connectivity provisioning</td>
<td>Prerequisite for e-mobility service provisioning is connected EV charging station to T-Ocean platform.</td>
<td>Ensures connectivity and data package where appropriate.</td>
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<tr>
<td>6. T-Ocean Operation &amp; Main.</td>
<td>It is the core engine of EV charging stations.</td>
<td>Operates with T-Ocean backend.</td>
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<td>7. Roaming Scheme Inclusion</td>
<td>Enables EV charging station utilization boost, that is prerequisite for commercial exploitation.</td>
<td>Enablement of various roaming schemes.</td>
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<td>8. Enabling access by text messages</td>
<td>Provides a superb customer experience and convinience.</td>
<td>Enables access and payment at EVC by means of VAS text messaging service.</td>
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<td>9. Enabling access by T-Charge RFID</td>
<td>Enables access to EV charging stations operated under CT. Enables</td>
<td>Enables unified RFID card.</td>
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<tr>
<td>10. Enabling access by T-Charge APP</td>
<td>Provides a superb customer experience across EU footprint and enables charging service monetization.</td>
<td>APP operator/enabler.</td>
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Croatian Telecom, Inc
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THANK YOU FOR YOUR ATTENTION!