Electric mobility case study for Croatia

In mid 2010, Energy Institute Hrvoje Požar launched the E-mobilnost.hr initiative before the gathered partners and representatives from the Croatian industry.

E-mobilnost.hr is the first initiative in Croatia whose primary role was to provide an interactive communication platform and the basis for establishing partnerships between all relevant stakeholders, such as politicians, entrepreneurs, decision-makers and citizens who are inspired by electric vehicles, as well as those who are about to become ones.

In order to familiarize the citizens with the concept of e-mobility, its benefits, opportunities and challenges soon to be faced, the www.e-mobilnost.hr portal was launched aiming to affirm the development of the electric vehicles market and the supporting infrastructure in Croatia.

In 2010, the Energy Institute Hrvoje Požar prepared for the City of Zagreb the Strategy for the development of electric vehicles charging infrastructure in the City of Zagreb.

Since then, we have been continuously working on the promotion of e-mobility as well as on EU projects which encourage the development of infrastructure for electric vehicles and new business and transport models (MOBINCITY, PRO-E-BIKE, etc.). Also, the Institute prepared the technical basis for defining the draft national policy framework for implementing the Directive of the European Parliament and of the Council on the deployment of alternative fuels infrastructure.
The first charging station in front of the Energy Institute Hrvoje Požar, Savska cesta 163, Zagreb
The first registered car in the Croatian market, Citroen C-Zero owned by the Energy Institute Hrvoje Požar

The infrastructure of charging stations is expanding, and currently in Croatia we have a total of 54 active charging stations, 14 of which are located in Zagreb. Exact locations you can find on ChargeJuice application or on www.puni.hr web site.

Previous two rounds of incentives from the Environmental Protection and Energy Efficiency Fund amounting to HRK 70,000 per electric vehicle, HRK 50,000 for PHEV / PHV and HRK 30,000 per hybrid vehicle, increased the number of cars on roads, but the current number is still very small.
Registered M1 vehicles with electric and hybrid power in Croatia, Source: Croatian Centre for Vehicles

Registered L-category vehicles with electric and hybrid power in Croatia, Source: Croatian Centre for Vehicles
Example company (implementation/use of e-bikes) - Croatian Post

The Croatian Post is the national post company. The Croatian Post continuously follows logistics trends and tests new vehicles with delivery potential. Accordingly, the Croatian Post was a testing company for electric bikes within the PRO-E-BIKE project (promoting-e-bike-delivery) conducted by the Energy Institute Hrvoje Požar. Even before the completion of the project, considering that they were satisfied with the results, they submitted an application in response to the Call for Proposals by the Fund for Environmental Protection and Energy Efficiency with their project Improvement of energy efficiency by introducing e-bikes into postal service. The project was recognized by the Fund, and co-financing of the purchase of 180 electric bikes was approved. The estimated annual savings (one e-bike replaces one petrol-powered moped) is around HRK 7,000. After replacing 180 mopeds with 180 electric bicycles, the total estimated cost savings amounts to 86.52%. The environmental advantage is that the replacement will reduce CO₂ emissions by 100.31 tons annually.

Electric bicycles FreeDuck 2 are a result of cooperation between the company Ducati komponenti d.o.o. from Ludbreg and the Slovenian bicycle manufacturer Krpan. FreeDuck 2 has a 250 W Ducati engine and reaches a maximum speed of 25 km/h. The lithium-ion battery enables a driving range of 60 kilometres on a single charge. It takes three hours to charge the battery, and bicycles are charged in post offices across Croatia where they are deployed. The bike’s load-bearing capacity (rider and cargo) is 200 kilograms.
Example town (implementation/use of e-bikes) - Čakovec

In May 2015, the project *Cleaner transportation in the Town of Čakovec* was implemented. The project established and organized a sustainable and environmentally-friendly public transport by introducing e-bikes, and the use began in June 2015. Using cars for routes up to 60 km was replaced with e-bikes, and thus the consumption of fossil fuels as the most common source of energy for cars was replaced in favour of electricity consumption, which is ecologically a more acceptable energy source. In the first phase of the project, 30 parking stands/racks for 20 electric bikes were installed, 2 charging stations and 500 user cards were made. In 2016, the town of Čakovec is moving into the second phase of the project implementation, which includes the purchase and installation of additional 10 e-bikes, 15 electrical parking rack units and two charging stations, in view of increasing the efficiency of e-bikes from the current average 4.5 hours to 12 hours per day. The upgrade of the existing system will increase the number of users from 100 to 400. The assumption regarding the number of users is based on the fact that citizens will no longer use electric bikes as an attraction, but as a regular public transport, and by installing two new terminals in the eastern and western part of the town, bicycles will be accessible to the residents of these areas. The increase in the number of hours of daily e-bike use will further reduce the consumption of petrol as fuel and emissions of CO₂ into the atmosphere, it will increase energy efficiency in traffic and reduce noise levels in the town. The system of using public e-bikes is a contribution to the community, as it provides citizens with a fast, simple and flexible system of personal transportation to distances up to 60 km. It also contributes to the
overall mobility and connecting the town to the suburbs, it enriches the tourism potential, improves the image of the town.
Further information about the project: www.stromcek.hr
Example town - Koprivnica

In 2014, in order to stimulate electric mobility and for the purpose of regular activities of the town administration and employees of town companies, the town of Koprivnica purchased five electric vehicles, a plug-in hybrid vehicle and a hybrid vehicle. The vehicles were purchased as a part of the CIVITAS DYN@MO project, the primary aim of which was to reduce the operating expenses of town vehicles by 24% and to reduce CO2 emissions relating to transport of employees of the town administration and town companies by 27%. For easy use and charging of electric cars, five fast HEP ELEN charging stations were installed in central locations in the town. The energy used for charging in these stations is produced exclusively from renewable energy sources.

In addition to electric cars, two electric mini buses were bought with a capacity of 13 seats. We currently plan to introduce other lines of public transport with electric mini-buses (currently one line is operational). The planned final implementation is in 2020.

Also, a terminal with 10 electric bikes was installed at the Campus (there are 7 other BicKo system terminals with a total of 70 regular bicycles in the town (10 per terminal)). Public e-bikes are an optimal way to connect those parts of the town of Koprivnica to which the distance is over five kilometres. Accordingly, the public bikes terminals system is planned to extend to the area of nearby settlements, and an increase in the number of public e-bikes is predicted according to demand until 2017.

In addition to public transport by electric mini-buses and e-bikes, the Plan also provides for establishing a car sharing system related to electric cars owned by the Town. By purchasing five electric and two hybrid vehicles, the town of Koprivnica significantly contributed to the promotion of sustainable transport and economic savings in the town administration. In order to continue the positive trend, it is necessary to encourage further investment regarding the purchase of electric vehicles for other companies in the town of Koprivnica.

In addition to the use of electric vehicles for the purpose of field technical interventions, performing field activities and travelling for the purpose of business meetings and various town events, the use of these vehicles can be much broader, such as the procurement of electric vehicles for the purpose of delivery, waste collection, for the needs of fairs etc. is also planned.

The purchase of electric vehicles for the town administration and town companies, and encouraging the electric car purchase for private companies, is anticipated throughout the planning period of the Plan, according to the demand and the implementation of other measures of electric mobility provided within this Plan.

For the purpose of the existing number of electric vehicles in the town of Koprivnica, there is a sufficient number of fast-charging stations. In accordance with the development of electric mobility, it is also necessary to develop the network of fast-charging stations for electric vehicles. Under the condition that companies in the Town purchase electric vehicles, the construction of fast-charging stations on the premises of the companies is proposed to allow an unobstructed access of citizens to public fast-charging stations. After the implementation of all the electric mobility measures set out in the Plan, the construction of a network of charging stations is planned in accordance with the results of the monitoring plan.
Case study production company – electric bicycles designed and manufactured by Rimac Automobili

Greyp G12 was the first electric bicycle designed and manufactured by Rimac Automobili, an model built around the vast knowledge and experience gathered from in-house development and production of the Concept_One supercar. After the extremely successful firstborn Greyp G12 which was delivered to 26 countries on 5 continents, its successor, the new and fresh Greyp G12S, with its stunning performance takes the whole experience even further.

Many unique and intuitive features are developed from the ground up in order to make the everyday usage of Greyp even more pleasing and fun. Sophisticated biometric sensor is used to activate the bike, which can be programmed to deploy different riding modes for different riders or even for a specific finger. With quick recharging abilities you will never be left high and dry and 3 pre-set riding modes will provide you with a desirable bike setup for every situation, weather you just feel like cruising down the streets or you’re in the mood to win the traffic-light grand prix.

The one of a kind user interface helps you plan your rides more efficiently and keeps you up to date with all of the bike’s parameters.

Specification:
• 70 km/h top speed (electronically limited)
• 80 minutes recharging time
• range up to 120 km
• 12kW peak power
• battery capacity 1,5 kWh
• Li-ion battery
• 4,3” colour touch display

Till now Greyp sold over 100 bikes in 22 countries all over the World (Croatia, Italy, Switzerland, Netherlands, Czech Republic, Luxembourg, Estonia, United Kingdom, Sweden, Germany, Russia, China, USA, Colombia, Ecuador, South Africa, Austria, UAE, Luxembourg, Peru, Monaco, France).

If you want to know more: http://www.greyp.com/
https://www.youtube.com/watch?v=4XK3xFxs-c
“Nikola Tesla EV Rally Croatia” is the first rally for electric vehicles only held in this part of Europe. The rally has been held since 2014. The participants are local and foreign electric vehicle drivers, entrepreneurs, tourists and adventurers. The idea of the rally is a joint cooperation and integration of partners, towns and villages, tourist offices and related institutions in order to establish the infrastructure for electric vehicles. On the rally route, charging stations for electric vehicles are placed in the most attractive tourist sites as well as the start of the planned “Green Tourist Electric Highway” (Rovinj, NP Paklenica, Smiljan - MC Nikola Tesla, Poreč, and 7 in the city of Zagreb on private premises). Until the end of 2016, 10 more charging stations are planned to be installed.

As part of the rally, vehicles and charging stations will be presented and panel discussions on e-mobility and green technologies will be held, and those companies which already actively participate in reducing pollution and CO2 emissions as well as reducing noise in urban centres through their activities and business will be presented.