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Proposal for Economic and Financial Incentives Regarding E-Mobility in Montenegro

Study prepared by Energy Institute Hrvoje Požar | Zagreb | February 2019



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1. INTRODUCTION

The Purpose and Objective of this Document

The development of the e-mobility market is based on the attractiveness of electric vehicles for the end-buyer or user of that vehicle – an electric vehicle needs to be more attractive from both a financial and nonfinancial aspect to the buyer/user than a conventional vehicle. The attractiveness of an electric vehicle depends on a number of factors, such as those specific to a particular market (legislation, incentives, infrastructure availability) as well as general factors that equally affect any market (battery capacity or range of vehicles). Therefore, the promotion of mobility includes a whole range of activities ranging from formulating state incentives, creating conditions for the development of a CHARGING INFRASTRUCTURE FOR ELECTRIC VEHICLES, designing legislative and regulatory frameworks as a basis for the development of market and business models, to implementing a range of promotional and public awareness measures directed at individuals, the public sector and private legal entities. The factors that influence the development of e-mobility market are shown in the figure below.

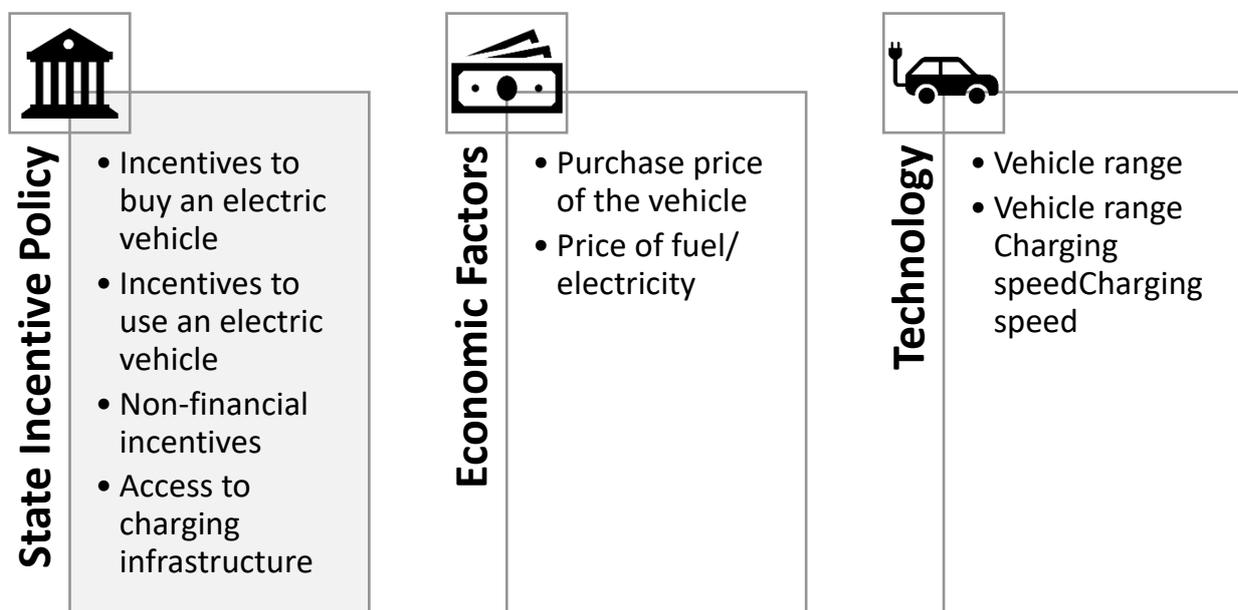


Figure 1: Factors Influencing the e-Mobility Market¹

This document focuses precisely on the elements of a state incentive policy which may help to stimulate the development of e-mobility in Montenegro. The recommendations are based on previously prepared studies which were all part of the UNDP's "Feasibility Study of the e-Mobility Concept in Montenegro" project:

1. Situational Analysis of the Legislative, Institutional and Financial Framework for e-Mobility in Montenegro;
2. Analysis of the e-Mobility Market in Montenegro; and
3. Cost and Benefit Analysis of the e-Mobility Concept in Montenegro - Case Studies.

The following incentives were considered:

¹Source: <https://www.accenture.com/acnmedia/PDF-37/accenture-electric-vehicle-market-attractiveness.pdf> (the website accessed on 27 May 2019)

1. Fiscal incentives – use of the tax system for the purpose of promoting the purchase and use of electric vehicles;
2. Financial incentives - instruments to reduce purchase price differences between classical and electric vehicles, and instruments for the development of a CHARGING INFRASTRUCTURE FOR ELECTRIC VEHICLES;
3. Non-financial incentives - measures that could be implemented at national or local levels, and which would make the purchase and use of electric vehicles more attractive.

The proposed incentives in all three categories represent a comprehensive approach to encourage the introduction of e-mobility in Montenegro. However, the use of all these incentive measures depends on many factors and the engagement of various stakeholders. That is why an emphasis has been placed on the incentives that can be provided by the state; these include financial incentives from the Eco Fund.

Namely, with the establishment of the Eco Fund, Montenegro has established a central institution for the collection of funds and their dedicated distribution to environmental projects and programs; this explicitly includes the promotion of cleaner traffic and the use of alternative fuels in transport. Through making this move, Montenegro joined other countries in the region, where such funds are operated and successfully promote e-mobility (Croatia, Slovenia). The Eco Fund is expected to become operational in the second half of 2019. Given that this is a completely new institution, whose main task is to promote and stimulate activities that contribute to the protection of the environment, it is extremely important that the Eco Fund is recognized and positively accepted by the general public at the beginning of its activities. The e-mobility incentive scheme could certainly contribute to this goal and could also ensure favorable prerequisites for the operation of the Eco Fund in other areas.

An incentive scheme, implemented by the Eco Fund, should be simple and attractive to end users. It should not be administratively demanding, given the limited capacity of the Eco Fund, at least initially, and should be transparent whilst also being accompanied by strong promotional and public awareness raising activities. These are the main postulates on which the proposal made in this document was based.

In order for the Eco Fund to implement an incentive scheme, it would be extremely important for sufficient revenue to be provided. Given the importance of transport in achieving energy and climate goals, it is expected that Montenegro will have access to international funds that could be directed to e-mobility by the Eco Fund. However, it would also be necessary to ensure stable sources of revenue; this aspect is also addressed in this document.

Document Structure

Chapter 2 provides an overview of potential e-mobility incentives in Montenegro in all three categories listed above.

Chapter 3 provides a proposal for Eco Fund activities to stimulate e-mobility in Montenegro; this includes an analysis of possible revenues and a proposal for the operation of an incentive scheme for electric vehicles along with a CHARGING INFRASTRUCTURE FOR ELECTRIC VEHICLES.

Chapter 4 includes the main conclusions arising from the analysis.

2. OVERVIEW OF POSSIBLE INCENTIVES FOR E-MOBILITY IN MONTENEGRO

INCENTIVES FOR ELECTRIC VEHICLES

With regard to certain technological features of electric vehicles that represent disadvantages compared to conventional vehicles (charging time, lower range), along with purchase prices that still remain relatively high, countries that have opted for the development of e-mobility have designed a series of measures aimed at increasing the attractiveness of their purchase and use. Generally, incentives can be divided into fiscal measures, financial measures and non-financial measures.

2.1.1. Fiscal Incentives

It is stipulated by the Law on Tax on the Use of Passenger Motor Vehicles, Vessels, Airplanes and Aircrafts ("Official Gazette of the Republic of Montenegro", 28/2004 1 37/2004 and "Official Gazette of Montenegro", 86/2009) that tax is paid annually according to an engine's operating volume. Taxes on motor vehicles are calculated by motor vehicle owners. Tax is payable upon the registration of a motor vehicle. The Ministry of Interior is responsible for the control of taxation. Motor vehicles cannot be registered without proof of payment of tax. **No motor vehicle tax is paid for electricity powered motor vehicles.** This exemption from the payment of tax represents an existing incentive for the purchase of an e-vehicle. Revenues collected on this basis are entirely directed to the state budget. Taking into account that the use of vehicles is an extremely high source of pollution, it would be absolutely justifiable to allocate funds from this tax to the Eco Fund to be used for projects that reduce traffic pollution, such as promoting the purchase of electric vehicles and developing a charging infrastructure. It should be noted here that there is space and reasoning for amendments to be made to this Law. Namely, tax calculations are exclusively based on engine volume/power with additional tax reductions allowed for older vehicles; this is not environmentally friendly because it does not take into account the ecological characteristics of the vehicle, such as the CO₂ emission data, for example. Therefore, this law should be amended and the collected funds should be transferred to the Eco Fund. It is necessary retain the current tax exemption for electric vehicles.

Other obligations to pay various fees related to vehicles are based on the following acts²:

- Decree on the costs of technical inspection of vehicles ("Official Gazette of Montenegro" 16/2013) – determining technical inspection costs by vehicle type and volume
- Decision on determining an annual fee for the use of roads payable at the time of registration of motor vehicles, tractors and towed vehicles ("Official Gazette of the Republic of Montenegro", 60/2005) – determining an annual fee for the use of roads payable at the time of registration of motor vehicles, tractors and towed vehicles, according to the engine type and volume and depending on the type of vehicle
- Decision on determining a special fee for motor vehicles and towed vehicles ("Official Gazette of the Republic of Montenegro", 60/2005) – determining a special fee for motor vehicles and towed vehicles for the purpose of ensuring the smooth running of the traffic and the provision of information services to the road users, depending on the type of vehicle;
- Rulebook on registration of vehicles ("Official Gazette of Montenegro" 10/2015, 21/016, 43/2016, 42/2017) – specifying the price of registration plates depending on the type of vehicle

E-vehicles are not recognized specifically in any of these acts, i.e. they are not exempted from the payment of any of the aforementioned fees. The introduction of the exemption from some of these fees

²UNDP Montenegro: *Situational Analysis of the Legislative, Institutional and Financial Framework of Montenegro for e-Mobility*, produced by EIHP, February 2019.

could be considered as an additional measure to promote e-mobility; however it would not significantly affect the financial viability of an e-vehicle, nor ultimately the decision to purchase one.



It is recommended that tax on the use of motor vehicles should be promoted as an important incentive for e-vehicles. Tax could be modified to have a strong ecological character; tax revenues could be directed to the Eco Fund to be used as incentives for e-mobility and in conjunction with other clean transport projects.

2.1.2. Financial Incentives

Financial incentives are used to foster market development and are usually introduced when a market is not sufficiently developed to accept products or services that bring wider social benefits.

The social benefit of e-mobility can best be seen by monetizing social benefits. In the period up to 2050, with the realization of the foreseen increase in the number of registered electric vehicles in Montenegro, **the total monetized social benefit of avoided CO₂ emissions would amount to approximately EUR 530 million.**³ In addition, there would be other benefits that cannot be monetized, but their benefits cannot be neglected. This relates particularly to the development of an electric vehicle charging infrastructure and the development of new related services; these elements would represent important economic opportunities, namely the development of new 'green' jobs. Additionally, the development of e-mobility would increase the attractiveness of Montenegro as a tourist destination whilst at the same time presenting it as an environmentally conscious state.

The Montenegrin e-mobility market analysis⁴ argued that the market was at an early stage of development; positive development tendencies were observed on the supply side, whereas a stronger stimulus for further development was perceived on the demand side. The available products, technical knowledge and experience in such market conditions are sufficient and capable of covering current demand, which is very low. For this reason, **demand should be stimulated by policy instruments.**

Having recognized the social benefits of e-mobility along with the market situation, financial incentives are seen as a necessary and crucial mechanism for stimulating demand. Increased demand would be the best stimulus for the supply side; it can already be said that the supply side is aware of forthcoming changes and is already taking certain steps to meet increases in demand, in line with business interests.

The financial analysis showed that direct incentives for the purchase of electric vehicles in the public and private sectors played a crucial role in the cost-efficiency of such investments. In the case of no incentive being provided, the net present value was only positive, the return period of the investment was only less than 15 years, and the profitability index was only greater than 1 **when a vehicle exceeded 20,000 km per year or more.** The previous market research found that only 18% of the population annually exceeded 15,000 km. Consequently, it was concluded that financial incentives were necessary to encourage individuals to purchase electric vehicles, with the aim of initiating the development of e-mobility in Montenegro.

The same is true for the public sector, where the financial indicators were even more unfavorable; for this reason input parameters based on the purchase of electric vehicles were used, in comparison to conventional low-priced vehicles.

With regard to the private sector, the diversity of business activities and the way that transport is used makes it impossible to make a general conclusion about the need for or the about the level of incentive required for the purchase of electric vehicles. A high class electric vehicle, when compared to a conventional vehicle of a similar class, that provides transfer services and has a high annual mileage, is viable without any financial incentives. It seems, however, that analyzes in many private entities would show that incentives would play a crucial role in assessing cost-effectiveness and in making a decision to purchase electric vehicles. This viewpoint should be taken very seriously and ranked above any

³UNDP Montenegro: Cost and Benefit Analysis of the e-Mobility Concept in Montenegro - Case Studies, produced by EIHP, May 2019.

⁴ UNDP Montenegro: Analysis of e-Mobility Market in Montenegro, produced by EIHP, April 2019.

promotional campaigns; if financial incentives were provided, it appears that a number of business entities might well decide to purchase electric vehicles.



It is recommended that an incentive scheme should be established for the purchase of electric vehicles. The scheme should be implemented and promoted by the Eco Fund, and should cover all three target groups: individuals, the public sector and the private sector.

Detailed recommendations on the characteristics of an incentive scheme for electric vehicles are given in Chapter 3.

2.1.3. Non-Financial Incentives

Non-financial incentives fall mostly within the competence of local self-governments (municipalities); such incentives could be manifested by granting special privileges to electric vehicles in comparison to conventional ones. Measures could include allowing preferential parking for electric vehicles, limiting access to motor vehicles with internal combustion, encouraging the greater use of electric vehicles among taxi drivers and rent-a-car companies, public awareness campaigns and publicizing the use of electric vehicles.

Such measures are considered as indirect measures that could contribute to producing a comparative advantage for electric vehicles in terms of time saving and increased comfort.

In this context, it is possible to identify activities that could potentially be carried out in the territory of Montenegro:

- Permitted entry into town center areas, where traffic is normally prohibited or restricted;
- Reserved parking spaces only for electric vehicles in public parking lots and garages, very often free of charge;
- Cheaper licenses and more licenses for taxi electric vehicles;
- Discounts on ferry and tunnel tickets;
- Promotional campaigns and public awareness events related to e-mobility.

INCENTIVES FOR CHARGING INFRASTRUCTURE FOR ELECTRIC VEHICLES

In order to align a potential increase in the number of electric vehicles with the number of places available for charging, it would be necessary, in parallel with an actual increase in the number of electric vehicles, to take measures to develop the infrastructure for charging electric vehicles. In addition to co-financing the development of charging stations, it would also be important to produce an appropriate legislative framework to create a market model that would enable such stations to be commercialized. This would provide business entities with an opportunity to create business models and to make financially viable investments.

In considering the drafting of, or amendments required to, a legislative framework for the development of a charging infrastructure for electric vehicles, it would be necessary to take into account the Directive of the European Parliament and the Council on common rules for the internal electricity market along with the amendments to Directive 2012/27/EU (amendment) (8 May 2019)⁵; these documents set out the market rules that should contribute to the creation of favorable conditions for electric vehicles of all kinds, i.e. to ensure the effective introduction of publicly available and private electric vehicle charging

⁵The text of the Directive can be accessed at:

https://www.consilium.europa.eu/register/en/content/out?typ=SET&i=ADV&RESULTSET=1&DOC_TITLE=&CONTENTS=&DOC_ID=10%2F19&DOS_INTERINST=&DOC_SUBJECT=&DOC_SUBTYPE=&DOC_DATE=&document_date_from_date=&document_date_to_date=&document_date_to_date_submit=&MEET_DATE=&meeting_date_from_date=&meeting_date_to_date_submit=&meeting_date_to_date_submit=&DOC_LANCD=EN&ROWSPP=25&NRROWS=500&ORDERBY=DOC_DATE+DESC (the website accessed on 27 May 2019) – at the time of drafting this document, the Directive was not yet published in the Official Journal of the European Union.

points along with the effective integration of vehicle charging into the system. Some key provisions of this Directive are outlined below:

- Energy management is crucial to enable smart vehicle charging and the efficient integration of electric vehicles into the power grid; this will be of crucial importance for the transport decarbonization process;
- Consumers should be able to use, store and sell self-produced electricity on the market and should be able to participate in all electricity markets by providing system flexibility, for example: by storing electricity, by using **electric vehicles**, by energy management or by energy efficiency programs;
- **Distribution system operators** need to integrate new ways of producing electricity in a cost-effective manner, especially those that produce renewable energy sources and new loads, such as loads coming from heating pumps and **electric vehicles**. For this purpose, based on established market procedures, distributing system operators should be enabled and encouraged to use services using distributed energy sources such as energy management and energy storage, to effectively manage their networks and to avoid costly network expansions. **Member States should establish appropriate measures such as national network rules and market rules, and should provide incentives for distribution system operators using network tariffs that do not prevent the flexibility or improvement of energy efficiency in the network.** Member States should also introduce network development plans for distribution systems to support the integration of renewable energy production facilities, facilitate the development of energy storage facilities and the electrification of the transport sector; system users should also be provided with relevant information regarding envisaged extensions or network upgrades. At present, in most Member States, no such procedures exist.
- A state should provide the necessary regulatory framework to facilitate the connection of **publicly available and private charging stations** to distribution networks. Member States will ensure that distribution system operators cooperate on a non-discriminatory basis with any undertaking that owns, develops or operates electrical vehicle charging stations, including their connection to the grid.
- Distribution system operators should not own, develop, run or operate **electric vehicle charging stations**, except for private charging stations solely owned by distribution system operators for their own use (there are certain exceptions defined in Article 33 paragraph 3).



Montenegro should align its electricity market legislation with the new Directive on Internal Electricity Markets, which will further contribute to the development of e-mobility and its integration into the electric power system. It is particularly important, through the tariff system, to enable the development of business models for the provision of electric vehicle charging services.

With regard to the co-financing program for the construction of a charging infrastructure for electric vehicles, it is generally recommended that construction be encouraged taking into account Directive 2014/94/EU on the establishment of an infrastructure for alternative fuels. Below are some key definitions provided in this Directive:

- The charging of electric vehicles at charging points should, if technically and financially feasible, be carried out by intelligent metering systems so that battery charging from the power grid would take place in periods of reduced electricity demand; this would contribute to the stability of the power system and would also enable secure and flexible data processing - this could, in the long run, also enable the powering of the grid from the batteries of electric vehicles during periods of high electricity demand;
- The installation and use of electric vehicle charging points should be developed as a competitive market, open to access by all parties interested in the introduction or operation of a charging infrastructure;
- **Low voltage** charging point means a charging point that allows the transfer of electric power to an electric vehicle whose power is equal to or less than 22 kW; this does not include devices whose power is less than or equal to 3.7 kW installed in private households or whose primary purpose is not to charge electric vehicles and which are not publicly available;

- **High voltage** charging point means a charging point that enables the transfer of electricity to an electric vehicle of more than 22 kW;
- Publicly available charging point means a charging point where power supply is provided and which allows non-discriminatory user access. Non-discriminatory access may include various features of authentication, use and payment;
- All publicly available charging points for electric vehicle users also need to provide the possibility of charging on an ad hoc basis without entering into a contract with the respective electric power supplier or operator.

With regard to technical specifications, the equipment of low voltage or high voltage charging points is regulated under Annex II to Directive 2014/94/EU:

- Low voltage motor vehicle charging points: because of their interoperability, the AC low voltage motor vehicle charging points will be equipped with at least sockets or connectors for **Type 2** vehicles according to **EN62196-2**. These sockets may be equipped with additional elements such as mechanical fasteners, where compatibility with **Type 2** is maintained.
- High voltage vehicle charging points: because of interoperability, the AC high voltage motor vehicle charging points will be equipped with at least sockets or connectors for **Type 2** vehicles according to **EN62196-2**. Because of their interoperability, the DC high voltage motor vehicle charging points will be equipped with at least the connectors for the **combined charging system** according to **EN62196-3**.



Montenegro should establish an incentive scheme for the development of an electric vehicle charging infrastructure for all legal entities, in a manner that takes into account all of the technical requirements of Directive 2014/94/EU.

PROMOTION OF E-MOBILITY

Given that electric vehicles and e-mobility are new concepts in Montenegro, active promotional campaigns and detailed information regarding their benefits are required, as well as detailed information on how to use electric vehicles. Promotional and public awareness raising activities should be carried out by competent state institutions, local self-governments and civil society organizations, especially those promoting sustainable development and environmental protection, as well as by educational institutions. In order to stimulate such activities, the Eco Fund, as a future central institution for the promotion of environmental protection, should launch such campaigns. Experience of similar programs within the region has shown that a combination of promotional campaigns and financial incentives was very effective in terms of raising the awareness of the general public. It is therefore recommended **that the Eco Fund should prepare and launch a strong promotional e-mobility campaign, immediately prior to publishing a financial incentive scheme.**

Based on the results of the market analysis⁶, the following recommendations may also be useful for providing focus to a campaign and for formulating key messages:

1. Characteristics of e-vehicles - the survey showed that only ¼ of the citizens were well acquainted with the characteristics of e-vehicles and over 90% of them did not have any experience of driving such vehicles - the campaign should certainly include car dealers/distributors and should allow test drives and similar activities that would bring such vehicles closer to individuals;
2. Ecological benefits of e-vehicles - although this is recognized by individuals as one of the most important characteristics of e-vehicles, further awareness is needed not only regarding CO₂ emissions but also regarding the benefits of such vehicles in terms of reducing local air pollution;

⁶UNDP Montenegro: *Analysis of e-Mobility Market in Montenegro*, produced by EIHP, April 2019.

3. E-vehicle charging – the lack of a public infrastructure for e-vehicle charging is perceived as the most important barrier for e-vehicle purchase by more than 2/3 of individuals - a campaign should clearly promote slow home charging during low tariff periods, whereby the highest cost-effectiveness of an e-vehicle would be achieved; the Eco Fund also plans to produce a map of available public charging stations in order to make such information easily accessible to everyone;
4. Financial cost-effectiveness of e-vehicles - this component of a campaign should certainly be linked to financial incentives and should point to the cost-efficiency of e-vehicles along with incentives provided; the Eco Fund also proposes to place a simple tool (calculator) on its website to calculate the cost-effectiveness of e-vehicle investment.

In addition to a central campaign to promote e-mobility in Montenegro, the implementation of which is planned by the Eco Fund, there are numerous other opportunities for promotional and public awareness raising activities; these could also be partially initiated by the Eco Fund in cooperation with other institutions and organizations such as:

- Organization of various professional events (conferences, forums, round table discussions, etc.) to present examples of good practice in the EU, in the region and in Montenegro related to e-mobility;
- Organization of public events for individuals targeting the promotion of e-mobility (e.g. within the EU Sustainable Mobility Week);
- Organization of activities and the development of public awareness raising materials directed at younger generations (kindergartens, schools);
- Inclusion of e-mobility in curricular and extracurricular programs at schools and universities; this area would significantly benefit from the establishment of an e-Mobility Lab within the Center for Engine and Vehicles of the Faculty of Mechanical Engineering in Podgorica;
- International co-operation in research and in the development of e-mobility.



Information, public awareness raising and promotion are key factors towards achieving the acceptance of the e-mobility concept. The most efficient way to raise awareness is through a combination of information and public awareness promotional campaigns combined with financial incentives. Such campaigns along with financial incentive schemes are of paramount importance. The role of the Eco Fund is evident here: to organize activities aimed at raising knowledge and awareness regarding e-mobility through self-initiated activities, and through the encouragement of other institutions and organizations to follow suit.

3. PROPOSAL FOR ECO FUND ACTIVITIES TO PROMOTE E-MOBILITY

POSSIBLE SOURCES OF FINANCE (ECO FUND REVENUES)

In November 2018, the Government of Montenegro adopted the Decision on the Establishment of the Environmental Fund – Eco Fund ("Official Gazette of Montenegro", 81/2018) with the aim of acting as a central national institution for financing and providing technical assistance to projects/programs in the field of environment, climate change and energy. It is stipulated by the Environment Law that the funds shall be provided from the Eco Fund for the preparation, implementation and development of programs, projects and other activities related to the conservation, sustainable use, protection and improvement of the environment, as well as for the exploitation of renewable energy sources.

The following sources of funding for the Eco Fund are stipulated in Article 76 of the Environment Law ("Official Gazette of Montenegro", 52/2016):

- budgetary funds;
- eco-charges;
- grants, donations and assistance;
- instruments, programs and funds of the European Union, United Nations and international organizations;
- foreign investments intended for environmental protection, and
- funds from other sources in accordance with the law

One of the fundamental principles of the operation of the Eco Fund is the greatest possible linkage of revenues and expenditures; this is to ensure the transparency of operations and to monitor the intended use of funds⁷. E-Mobility is part of the clean transport measures, so it is desirable to use the revenues from environmental pollution charges, coming from the transport sector, to incentivize it. As already pointed out, this shows the key role of **tax on the use of motor vehicles**. The funds collected on the basis of this tax are currently channeled into the revenue of the state budget and amount to approximately **EUR 8 million** per year; these funds should first be partly, and then fully, redirected to the Eco Fund. Given that traffic pollution is one of the major environmental issues in Montenegro, revenues from this tax should be directed not only to promoting e-mobility, but also to promoting cleaner transport in general; such revenues should also be used to support a wide range of environmental and nature protection projects, including projects related to air quality monitoring. First of all, as it has already been emphasized, it is necessary to 'green' this tax while maintaining the current exemption for electric vehicles.

In addition to the domestic sources of Eco Fund revenues, it is necessary to use the international sources available. Namely, international public finances play an important role in supplementing the country's efforts to mobilize domestic public resources. Complying with obligations under international conventions (including low carbon development and response to climate change), developed countries committed themselves to jointly raising USD 100 billion from different sources in response to the needs of developing countries. The resource mobilization process will also be implemented through the Green Climate Fund (GCF), to provide support to developing countries that have assumed commitments under the UN Framework Convention on Climate Change (UNFCCC). GCF is seen as one of the most significant international sources of funding for the promotion of e-mobility.

In the post-2020 period, and especially after accession to the European Union, funds, at first from **pre-accession funds** and later from **structural and investment funds** available to the state, should be used primarily for improving public transport; this will require extensive studies and plans, followed by

⁷UNDP Montenegro: Proposal for the Eco Fund Operating Model, produced by EIHP, June 2017.

large investments, but will also provide the opportunity for systematic problem solving in public transport and the integration of e-mobility as one possible solution.

INCENTIVE SCHEME FOR ELECTRIC VEHICLES

3.1.1. Subject Matter of Incentives

In the context of the promotion of electric vehicles, it is proposed that grants should be directed solely at the purchase of **new vehicles** which have not been registered at their time of import or sale. Such a vehicle could be purchased in Montenegro, in Europe or anywhere in the world, but would have to be registered in Montenegro to be eligible. Incentives should only be given for battery run electric vehicles. Plug-in vehicles do not need incentives, primarily because they are competitive with conventional vehicles on the market and, moreover, as they consume petroleum products they do not contribute significantly to the achievement of the specified goals; for this reason they are only considered as transient technology in the electrification of transport.

Incentives should be focused on four-wheeled vehicles to achieve the greatest positive social effects. Vehicle categories (according to European Classification⁸) to be promoted are:

- L6 and L7 - light and heavy four wheelers for commercial use solely designed for the carriage of goods or passengers:
 - L6 - 4-wheel motor vehicles (light quadricycles) with an empty vehicle weight that equals ≤ 350 kg, not including the battery weight of electric vehicles with a maximum design speed of ≤ 45 km/h;
 - L7 - 4-wheel motor vehicles with the exception of light four-wheelers (quadricycles) with an empty vehicle weight that equals ≤ 400 kg (550 kg for cargo vehicles), not including the battery weight for electric vehicles and whose maximum net engine power is ≤ 15 kW;
- N1 - Motor vehicles for the carriage of goods with a maximum permissible weight of ≤ 3500 kg;
- M1 - Passenger motor vehicles which, in addition to driver seats, have a maximum of eight seats.

For the optimum allocation of funds, i.e. the avoidance of co-financing luxury vehicles, it is proposed that the subjects of incentives, in the context of a personal vehicle, be categorized into A (mini), B (small), C (medium) and J (SUV) segments according to the European Commission categorization⁹.

3.1.2. Beneficiaries of Incentives

Common practice in the European Union is that target groups of incentive beneficiaries include individuals, the public sector and the private sector (private business entities). In this way, the procedures for the allocation of funds to citizens are mostly carried out separately and within a certain timeframe, while the procedure for allocating funds to legal entities (public and private sectors) is implemented in a unified manner.

3.1.2.1. Individuals

Every citizen will have the opportunity to benefit from an incentive to purchase no more than **one new** vehicle. In order to be able to exercise the right to an incentive, specific conditions should be met, which would usually include residence in the country where incentives are given (as evidenced by a copy of an ID card), and by compliance with the procedural actions defined in the public call for providing incentives (the delivery of all required documentation within the prescribed time and manner).

It is recommended that grant beneficiaries should be obliged to retain ownership or use (in the case of financial leasing) of a co-financed vehicle for at least one year from the date of its first registration.

⁸Source: <http://ec.europa.eu/growth/sectors/automotive/vehicle-categories/> (website accessed on 27 May 2019)

⁹Source: http://ec.europa.eu/competition/mergers/cases/decisions/m1406_en.pdf (website accessed on 27 May 2019)

3.1.2.2. Public Sector

The public sector plays an important role in promoting mobility; the allocation of funds by the Eco Fund would enable it to make a financially justified investment and it would, thus, be able to contribute proactively to the concept of e-mobility in its early stages of development. Public sector users should be allowed to procure one or more vehicles, whereby the maximum amount for co-financing (share in justified costs, i.e. maximum amount per user) would be defined in the public call.

It is proposed that incentives should not exceed 50% of the eligible costs, i.e. the cost of purchasing the vehicle; a maximum incentive amount should also be stipulated. Further differentiation between incentive percentages could be made according to the level of development of the municipality; thus, greater incentive percentages could be allocated to underdeveloped municipalities. Another way that differentiation could be made would be to measure local air pollution levels and nature endangerment levels; the highest incentive rates could be offered in such areas.

- An example of good practice -

Electric vehicles for delivery - Croatian Post

Source: Croatian Post

In order to increase energy efficiency in transport, the Croatian Post responded to a public call from the Environmental Protection and Energy Efficiency Fund with the project "Green and Sustainable Transport in Post Traffic Using Electric Vehicles". The fund recognized the project and approved the co-financing of the purchase of 20 electric quadricycles. The value of the investment for the purchase of electric vehicles amounted to HRK 1,280,100 (approximately EUR 170,000), and the Environmental Protection and Energy Efficiency Fund co-financed the procurement in the amount of HRK 400,000 (approximately EUR 53,000) in the form of a grant.



The introduction of these electric vehicles has enabled the Croatian postal service to improve its level of mobility in urban centers while delivering shipments and optimizing efficiency as it allows a gradual reduction in the number of vehicles using fossil fuels. Also, electric vehicles contribute to reducing the operating costs of the fleet and to increasing the energy efficiency of the Croatian Post. With the use of electric quadricycles for delivery services, the Croatian Post will annually reduce its CO₂ emissions by 7.6 tonnes.

The quadricycles are manufactured by the company Dukati ENERGIA S.P.A. Their electric vehicles are approved for two people and are specially designed for maneuvering in tight spaces; with a high load carrying capacity they respond well to the needs of postal traffic. Electric quadricycles achieve a maximum speed of 45 km/h and their range is 60 kilometers. The baggage

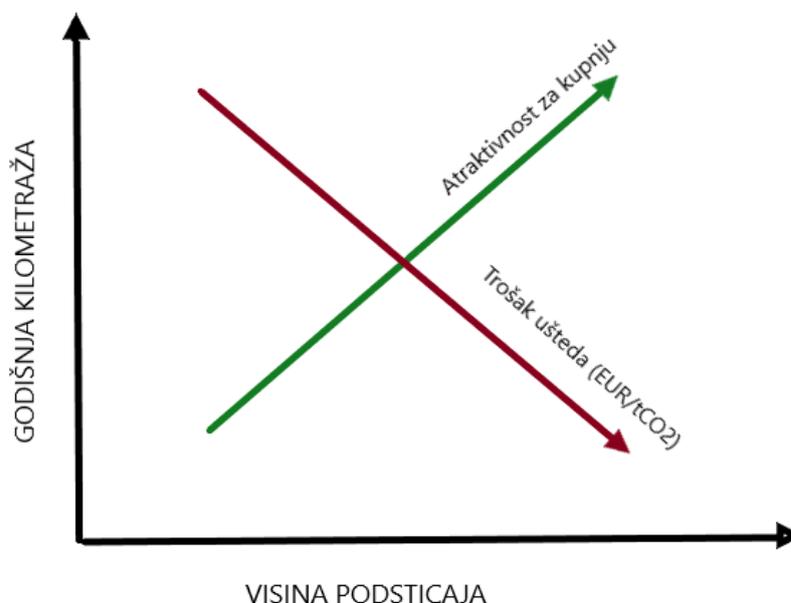
3.1.2.3. Private Sector (Legal Persons)

As for legal entities in the public sector, incentives should also be made available to legal entities in the private business sector. Namely, 'greening' the fleet of vehicles in the private sector could certainly contribute to the development of e-mobility. The principles and conditions for granting incentives could be the same as for the public sector. Attention should be paid to the rules on state aid, according to which the amount of incentives could be increased for medium (usually up to 10%), small and micro enterprises (usually up to 20%). In doing so, the maximum incentives for the same type of vehicle should always be the same.

3.1.3. Incentive Type and Amount

Due to the differences between the price of conventional and electric vehicles, the easiest way of incentivizing the purchase of an electric vehicle would be through a one-off grant for the purchase of such a vehicle. This kind of incentive would be proposed for all potential users (individuals, public and private business sectors). It is proposed that this kind of incentive system would be carried out for a period of at least five consecutive years to enable the creation of a 'critical mass' of electric vehicles in Montenegro; this is necessary for the further development of e-mobility services.

In order to determine optimum incentive levels for the purchase of electric vehicles to be allocated to users in the form of grants, a number of factors would need to be taken into account. The key determinants would be incentive attractiveness and cost savings (EUR/tCO₂). By increasing the amount of incentives, the attractiveness of purchasing an electric vehicle (financial viability) would increase, as would the social cost savings (EUR/ tCO₂) generated by the purchase of this vehicle. The main factor to influence these parameters would be the annual mileage of the vehicle. With a low amount of electric vehicle purchase subsidies, it would be financially viable (attractive) for only a small number of users who travel large annual mileages. On the other hand, a high amount of incentives would also make the purchase of electric vehicles attractive for users with small annual mileages; in such cases, the allocation of funds to such users would result in an extremely high level of cost of savings (EUR/tCO₂). According to the results of the cost and benefit analysis¹⁰, the cost of savings would be twice as low if an incentive of EUR 7,500 were given to buy a vehicle that had an annual mileage of 20,000 km, rather than an incentive of EUR 10,000 for a vehicle that had an annual mileage of 13,000 km.



Y axis - ANNUAL MILEAGE; X axis - INCENTIVE AMOUNT; green arrow - attractiveness for buying; red arrow - cost of savings (EUR/tCO₂)

¹⁰ UNDP Montenegro: Analysis of Costs and Benefits of the E-Mobility Concept in Montenegro - Case Studies, produced by EIHP, May 2019.

Figure 2: Illustrative relationship between the attractiveness of electric vehicle purchase and social cost savings depending on the estimated annual mileage and the level of incentive - the method of determining the optimum amount of incentives

Therefore, on the basis of all the analyzes carried out, **it is recommended that EUR 7,500 would be an optimal amount to be awarded in the form of a grant for the purchase of personal and commercial electrical vehicles (M1 and N1 categories) in Montenegro.** This refers to users in all sectors (individuals, public sector, private legal entities).

Regarding incentive levels for the L6 and L7 vehicle categories, the optimal amount to be awarded in the form of a grant would be proposed as EUR 2,000. In Croatia and Slovenia, such grants are worth approximately EUR 2,600 and EUR 2,000, respectively.

3.1.4. Incentive Allocation Mechanisms

Based on the event of a public call for co-financing the purchase of electric vehicles, funds should be awarded to individuals or legal entities.

If there were available resources for this, it is recommended that public calls should be published twice a year. This would create continuity for the implementation of measures which would enable better planning both on the demand side and on the supply side. The discontinuation of such a measure could potentially lead to adverse effects on the market. Analyzes of the effects of public calls could point to the need for certain adjustments and improvements or to the further implementation of the measure. In addition, media attention should be intensified during public call periods, as this would increase the visibility of the implementation of the measure; it would also contribute to raising public awareness regarding e-mobility and would continue to create positive perception regarding the operation of the Eco Fund.

It is recommended that each application should be evaluated strictly in the order received when responding to a public call. Most specifically, it was concluded that the introduction of any additional elements to be considered in the scoring (regard to the vehicle category, property or income censuses) would greatly impede the administrative implementation of such a measure. Therefore, it is recommended that applications should be processed and approved according to their order of receipt, and that it would be **extremely important to establish a good web application system** to display the number of applications received and the amount of remaining funds available at any time.

Additional documentation for application should be extremely simple, especially for individuals, and should include proof of identity as a citizen or legal person with permanent residency/place of registration in Montenegro along with an offer from a vehicle dealer/distributor with attached information on the technical characteristics of the vehicle (category, manufacturer, type, model, power, etc.). For legal entities, depending on the general rules of the Eco-Fund, additional certificates would probably be required (e.g. tax returns, etc.).

The payment of funds could only be completed after proof of both payment and registration. Depending on the rules determined for the operation of the Eco Fund, it would be possible to establish business relations with banks to allow for the immediate deduction of the incentive amount approved by the Eco Fund from the loan agreed for the purchase of the vehicle; this would be paid directly into the account of the bank in the case of such arrangements.

The table below summarizes the basic features of the incentive scheme proposed by the Eco Fund for electric vehicles.

Table 1: An overview of the basic features of the incentive scheme proposed by the Eco Fund for electric vehicles

Target group (beneficiaries)/ elements of incentive scheme for electric vehicles	Individuals	Public Sector	Private Sector
Subject matter of incentive	Personal vehicles of category M1, N1, L6 and L7 A (mini), B (small), C (medium) and J (SUV) segment		
Conditions for	Natural person with a	Legal person registered in	Legal person, entrepreneur

application	place of residence in Montenegro	Montenegro	registered in Montenegro
Incentive type	Grant		
Incentive amount	For M1 and N1 – EUR 7,500 For L6 and L7 – EUR 2,000 up to 50% of justified costs	For M1 and N1 – EUR 7,500 For L6 and L7 – EUR 2,000 up to 50% of justified costs – possible differentiation by development or pollution	For M1 and N1 – EUR 7,500 For L6 and L7 – EUR 2,000 up to 50% of justified costs – possible differentiation by company size
Incentive payment method	Payment to the user's account based on proof of vehicle purchase (copy of the invoice, copy of the license, proof of payment of the vehicle) Alternatively - arrangements with banks and leasing institutions for direct deduction of liabilities based on approved Eco Fund grants to be transferred directly to the account of the bank		
Implementation mechanism	Public call, twice a year; System for e-application to the public call		
Application documents	A copy of the ID card; offer from a dealer/distributor with accompanying information on the technical characteristics of the vehicle	Extract from court register; Offer from a dealer/distributor with accompanying information on the technical characteristics of the vehicle	Excerpt from court or trade register; offer from a dealer/distributor with accompanying information on the technical characteristics of the vehicle
		Other documentation according to the rules of the Eco Fund: e.g. tax administration certificate, proof of funds provided in the budget for the purchase of vehicle, etc.	Other documentation according to the Eco Fund rules: e.g. tax administration certificate, solvency certificate, etc.

3.1.5. Estimates of the Required Funds for Incentives

According to the scenarios for the development of e-mobility in Montenegro¹¹, of the total number of passenger cars in Montenegro, electric vehicles could be expected to represent 1% by 2025. That figure would be 2.255% of all electric vehicles. It can be expected that some of these vehicles would have been purchased with incentives. The presumed share is about 2/3, which equals about 1,500 vehicles. Assuming that incentives would be offered over a five-year period from 2021 to 2025, the resources to foster the purchase of around 300 vehicles should be provided on an annual basis. With the recommended co-financing of EUR 7,500 per vehicle, this would mean that **EUR 2,250,000 would need to be provided annually**.

In comparison, the fund in Croatia, in 2019, provided around EUR 4,500,000 to foster the purchase of electric vehicles to citizens and legal entities, whilst in Slovenia this amount was EUR 3,600,000.

Eco Fund revenues reallocated from the state budget, along with those collected by the Eco Fund on the basis of existing eco-fees, would not be sufficient to support such a scheme of incentives. As already mentioned, one of the solutions for the permanent provision of funds would be the 'greening' of motor vehicle taxation and the reallocation of part of these funds to the Eco Fund to be used for cleaner transport projects. In addition, it would be crucial to attract the resources of international institutions and to commit them to fostering e-mobility.

¹¹UNDP Montenegro: *Situation Analysis of the Montenegrin Legislative, Institutional and Financial Framework for E-Mobility*, produced by EIHP, February 2019

Additionally, it should be noted that it is not realistic to expect that in the first year of such an incentive scheme, a target figure of 300 assigned incentives would be realized. Most probably, at the start it would be sufficient to have available funds to foster the purchase of only around 50 electric vehicles (EUR 375,000); however, it is also expected that interest in incentives would rise sharply after the first public call and that future calls would be much higher, thus requiring the full amount calculated.

3.1.6. Risks and Protection Mechanisms

When establishing electric vehicle incentive schemes it is also necessary to take into account possible negative effects as well as potential misuse.

One potential negative effect of providing grants to consumers to purchase electric vehicles is the consequent potential impact on retail prices set by distributors. It is therefore recommended that not only should the allocation of funds be allowed for vehicles purchased in Montenegro, but also for vehicles purchased in any other country, or imported through an individual's personal arrangements.

It is also necessary to prevent a user from possibly misusing funds provided in grant form by selling the vehicle for which the funds were allocated. Therefore, it is recommended that a public call should define the conditions in such a way that the beneficiary of the grant would be obligated to retain ownership or use (in the case of financial leasing) of such a co-financed vehicle for a specified period from the date of its first registration (e.g. one year); whereby the Eco Fund would retain the right to control the status of ownership of a co-financed vehicle.

The Eco Fund should also retain the right to monitor the intended use of its resources for the entire duration of the concluded contract; this should include the conditions to be fulfilled by the selected applicant and those which formed the basis for the approval of the funds and the conclusion of the contract.

INCENTIVE SCHEME FOR A CHARGING INFRASTRUCTURE FOR ELECTRIC VEHICLES

In addition to electric vehicle incentive schemes, the Eco Fund should also foster the development of an electric vehicle charging infrastructure. Incentives should be aimed at legal entities from both the public and private sectors.

The basic investment in a charging infrastructure would include the purchase of a charger, the fee for connection to the distribution system of electricity and preparatory works (the power and communication port performance and parking lot), installation and commissioning of the charger.

Based on previous experience from EU countries, within the context of providing financial incentives for infrastructure, it is obvious that the purchase of a charger is the only justifiable expense; connection fees and preparatory works were, in principle, considered to be unjustified expenses. Given the specifics of the existing market in Montenegro, the fee for connecting to the distribution system could be an obstacle to the development of publicly available infrastructure. Therefore, taking into account the fact that compensation for this would be a predictable and transparent expense, it is proposed that this should be considered as part of the justified expenses of co-financing. However, in order to motivate the investor to select an optimal location which required a relatively small amount of preparatory work, it is suggested that the works element would not be considered as justified expense.

Table 2: Examples of investment incentives for the procurement of an EV charging infrastructure in the region

	Users of funds	Amount	Justified investment expense
Croatia	The right to funds can be acquired by units of local and regional self-government, state administration bodies, other budget and extra-budgetary users, companies, natural	Maximum 200,000 HRK (about 26,600 EUR) per user. The amount of funds allocated must not exceed 40% of the justified costs.	Chargers with a minimum total power of 50 kW (DC) or 22 kW (AC), equipped with connection systems according to accepted European standards that support possibilities of charging the fee, reporting and analytics. Costs include equipment and start-up expenses, software billing and analytical costs, and the costs of expert supervision by a licensed engineer. The

	persons (craftsmen and freelancers) and non-profit organizations (except associations and cooperatives)		costs of the connection to the distribution network, as well as the costs of installing the system for own charging power supply, do not represent justified costs. VAT is a justified cost if it is not recoverable, or if the applicant is not entitled to deduct.
Slovenia	Territories/Municipalities with Natura 2000 sites or in protected areas (regional / landscape parks). The charging station must be located in the area of the municipality that submitted the request. Municipalities can manage the charging stations themselves or can contractually assign them to the management of the protected area operator.	A non-refundable financial incentive up to 100% of the value for each charging station, but not more than 3,000 EUR for one AC charging station, or not more than 5,000 EUR for one DC charging station.	Justified costs include the purchase of a new charging station. Costs that are not justified include VAT, connection point, parking lot arrangements and corresponding street markings, including a traffic sign.

Directive 2014/94 / EU on the establishment of an infrastructure for alternative fuels prescribes basic guidelines for the establishment of a publicly accessible infrastructure for charging electric vehicles. In this context, Montenegro should establish a common framework of measures whose results would be manifested as a sufficient number of publicly available fast chargers. Therefore, it is suggested that the incentives in Montenegro should initially be targeted towards the creation of such an infrastructure (chargers with a power exceeding 22 kW).

The basic elements of the incentive scheme for charging stations in Montenegro are shown in the table below.

Table 3: An overview of the basic features of the proposed incentive scheme for an infrastructure for charging electric vehicles by the Eco-Fund

Target group (beneficiaries)/ Elements of incentive scheme for electric vehicles	Public Sector	Private Sector
Subject matter of incentive	Procurement of charging stations for electric vehicles; Connection of the charger to the distribution network	
Incentive type	Non-refundable funds (grant)	
Incentive amount	In the case of protected areas up to 80% of justified expenses. In other cases up to 60% of justified expenses.	Up to 40% of justified expenses.
Justified expense	The cost of charging station Connection fee for distribution system	
Non-justified expense	The cost of performing preparatory works and accompanying installations The cost of connecting the charging station to the previously secured power and communication port (commissioning) The cost of marking parking lots and purchasing and setting up traffic signs	
Incentive payment method	Payment to the user's account based on proof of installation and commissioning (copy of the invoice, proof of payment, copy of the license for use, report of the supervising engineer)	
Implementation mechanism	Public call, once a year; System for e-application to the public call	
Application conditions	Units of local self-government; Public institutions	Legal entities outside the public sector; Craftsmen
Application documents	Application Form; Main project with a BoQ; Proof of ownership over the land or construction rights	Application Form; Main project with a BoQ; Proof of ownership over the land or construction rights



- An example of good practice -

The island of Krk

Source: the City of Krk

Since 2016 there have been eleven charging stations for electric cars on the island of Krk; these are located throughout the island. This investment is a joint project co-financed by all of the local self-government units and the Environmental Protection and Energy Efficiency Fund.



The responsibility for the operation and maintenance of charging stations was taken over by the waste and energy management Company, *Ponikve eko otok Krk*, whose task it was to implement all strategic utility projects. A total of approximately EUR 126,000 (including VAT) was invested in the project, of which support from the fund amounted to 60%; the rest was provided by each unit of local self-government, in accordance with the number of chargers present in its area.

The general availability of infrastructure for the charging of electric vehicles would greatly affect the convenience and the confidence associated with the use of such vehicles. Therefore, in order to maximize the potential impact on the development of the market, apart from encouraging the development of the infrastructure in question, it is proposed that basic guidelines should be defined to enhance the visibility of chargers. By marking (e.g. in green color) parking spaces with the chargers, and by placing traffic signs to introduce parking restrictions for non-electric vehicles, additional promotional opportunities would be provided.

4. CONCLUSIONS

The development of e-mobility as a basis for sustainable and clean transport is one of the key elements of the transition towards reaching a low carbon economy. The dynamics of this process depend on the success of overcoming the barriers that prevent or slow down the development of market and business models, of increasing the share of electric vehicles in the fleet and of building a charging infrastructure. Globally speaking, e-mobility is still in its initial stages of development; in order to achieve a state where further development takes place exclusively based on market principles, a wide range of incentive measures are being implemented by many countries to achieve this goal. Circular interdependence between the number of electric vehicles and the availability of a publicly available charging infrastructure is well known - a small number of vehicles results in investment in an infrastructure being financially unprofitable, and a poorly developed infrastructure discourages users from purchasing electric vehicles. It is therefore advisable to introduce incentive measures simultaneously in both these market segments.

Thus, the establishment of financial incentives for e-mobility is being considered in Montenegro. The proposal is based on previously conducted analyzes of the Montenegrin legislative, institutional and financial frameworks as well as the e-mobility market; cost-benefit analyzes for individual target groups have been carried out and Montenegrin society as a whole has also been closely examined. All such analyzes have shown that financial incentives are absolutely necessary for the development of e-mobility in Montenegro.

Most significantly the key barrier for purchasing such a vehicle is the higher purchase price; however, some technological features of electric vehicles pose drawbacks in comparison to conventional vehicles (charging time, shorter range). In countries that have opted for the development of e-mobility, a number of measures have been designed to increase the attractiveness of the procurement and use of electric vehicles. Despite the fact that in Montenegro there is an exemption from the obligation to pay annual taxes on the use of electric vehicles, adequate financial incentives for the purchase of such vehicles are still unavailable.

For the purpose of defining the suggestions of these incentives, examples of good practice from the region, i.e. successful incentive schemes implemented by existing Eco funds, have been used; such funds are identical to the newly established Montenegrin Eco Fund. This fund is a scheme that provides grants for the purchase of electric vehicles, both for citizens and for legal entities from the public and private sectors. Suggested incentive levels were determined on the basis of cost and benefit analyzes, whereby the social benefits and attractiveness of incentives were made visible to potential vehicle owners.

In addition to the electric vehicle incentive scheme, it was also proposed that a scheme of incentives should be set up to develop a charging infrastructure for electric vehicles, especially by local government units; the development of an infrastructure along with other non-financial measures relating to the environment could significantly accelerate the development of e-mobility.

To establish a scheme of incentives, it is necessary to provide sufficient financial resources. To this end, it would be necessary to ensure that the Eco Fund had stable and sufficient sources of revenue; it has been strongly suggested that vehicle tax could be used for this purpose, which should also be 'greened'. It would also be necessary to work intensively on attracting international resources for this purpose.

Finally, it should be emphasized that, apart from the state offering financial incentives to encourage e-mobility, a whole range of other activities should also be carried out in Montenegro within the short term. Such activities include:

- complementing the legislative and strategic frameworks with clear objectives for the use of electricity in transport, in accordance with EU legislation on the establishment of an alternative fuel infrastructure;
- creating an legislative framework for incentives as a basis on which to develop the market and other business models relating to e-mobility; also to integrate electric vehicles into the electricity system in accordance with EU legislation on the internal electricity market;
- creating more favorable conditions for the development of an infrastructure for charging electric vehicles through tariff systems, and

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- implementing a series of promotional and educational measures aimed at citizens, the public sector and private legal entities.

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