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Electric **C**ity **Tra**nsport – Ele.C.Tra

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TABLE OF CONTENTS

1. SHORT OVERVIEW OF THE STATE OF THE ART 5

2. SWOT ANALYSIS OF THE INTRODUCTION OF ELECTRA MODEL 13

2.1. SCOOTER SHARING SYSTEM 14

2.2. PRIVATE OWNERS OF E-LIGHT VEHICLES 15

2.3. BUSINESS OWNERS OF E-LIGHT VEHICLES 16

3. GUIDELINES FOR THE INTRODUCTION OF ELECTRA MODEL 18

3.1. POLITICAL AND LEGISLATIVE SUPPORT 18

3.2. CONSTRAINTS FOR THE DEVELOPMENT OF THE ELE.C.TRA MODEL 24

3.3. POSSIBLE SOLUTIONS FOR THE CRITICAL ISSUES 27

4. SYNTHESIS OF THE POTENTIAL USERS' NEEDS 30

4.1. SCOOTER SHARING SYSTEM 30

4.2. PRIVATE OWNERS OF E-LIGHT VEHICLES 31

4.3. BUSINESS OWNERS OF E-LIGHT VEHICLES 31

5. POSSIBLE BUSINESS MODELS FOR THE IMPLEMENTATION OF ELECTRA..... 33

6. ECONOMIC AND FINANCIAL ASPECTS OF THE MODEL 34

6.1. SCOOTER SHARING SYSTEM 35

6.2. PRIVATE OWNERS OF E-LIGHT VEHICLES 36

6.3. BUSINESS OWNERS OF E-LIGHT VEHICLES 36

7. THE APPROPRIATE TECHNOLOGY AND INFRASTRUCTURE 38

8. THE IMPACT OF THE SUGGESTED SCENARIOS ON THE ENVIRONMENT..... 41

9. PLANNED ACTIVITIES FOR THE INTRODUCTION OF E-LIGHT VEHICLE SHARING SYSTEM 41

1. SHORT OVERVIEW OF THE STATE OF THE ART

In agreement with national and regional objectives and also having in view the experience in "sustainable energy" management of more developed cities, Suceava Municipality established a series of objectives and measures aiming to turn it into a "green" town. The objectives and measures were laid down in strategies and action plans, such as:

- **2009 – 2015 SUSTAINABLE DEVELOPMENT STRATEGY OF SUCEAVA MUNICIPALITY**

Following the analysis and meetings organized locally to put together the Development strategy, the view on sustainable development of Suceava Municipality was outlined and it addresses "Creating and **asserting the European identity of Suceava Municipality by its development and confirmation as a strong, stable and diversified economic centre, capable to ensure prosperity and improved quality of life** as well as by capitalizing on the tourism potential - the engine of local development and European integration pole".

In order to achieve this goal, four Strategic Development Directions have been proposed. The first direction is of interest for the project and aims to *Reinforce urban infrastructure, while protecting the environment (code: CIM*). In order to implement the strategic directions and given the national, regional and local planning instruments, **four specific objectives** were established**, out of which the following one is relevant to the project**:

- **Specific objective** CIM 1.3 **Extending, modernizing and rehabilitating the transport infrastructure:** Several programmes have been identified in the framework of this objective, **the one addressing the development of a green transport (CIM 1.3.4)** *aims to reduce problems caused by polluting transport generated by road traffic by developing green transport. Therefore, it is aimed to set up the specific infrastructure for electric vehicles and to promote the use of bicycles as efficient and clean transport mode.*

Reinforcing green transport infrastructure is needed in view of ensuring an organized modernization of Suceava Municipality. This will lead to an increased quality of life for all town citizens and to the rapid development of business and attracting new investment.

- **THE SUSTAINABLE ENERGY ACTION PLAN OF SUCEAVA MUNICIPALITY (SEAP)**

The Sustainable Energy Action Plan a strategic planning document defining the actions and measures to be taken locally in view of meeting **the general goal to reduce CO_2 emissions by at least 20% by 2020 compared to baseline year (2005).**

SEAP is based on a basic inventory of CO_2 emissions in order to identify the action fields the highest potential of increasing efficiency of power consumption translated into a decrease of CO_2 equivalent emissions, fields under the responsibility or in the sphere of intervention of local authorities of Suceava municipality.

In terms of reducing CO_2 emissions in Suceava Municipality during 2005 – 2020, the following targets are set:

Sector	MWh saved	MWh RES	T CO_2	% of the sector	% of the total
Water&sewage	752,5	0	527,5	25%	0,13%
Public lighting	1592,6	1	1117,1	40%	0,29%
Mobility	**82718,4**	**55**	**21625,2**	**19%**	**5,45%**
Biomass plant and district network	0	345059,5	132204,1	85%	33,77%
Buildings	17831,6	250	7348,9	4%	1,88%
Commerce	84137,1	21468,4%	34723,2%	33%	8,87%
Information	**na**		**na**	**na**	**na**
TOTAL	**187032,1**	**366833,9**	**197246,0**		**50,38%**

In which the mobility:

-21.325,2 t CO_2
- 19% of the impact = - 5,45% of the total

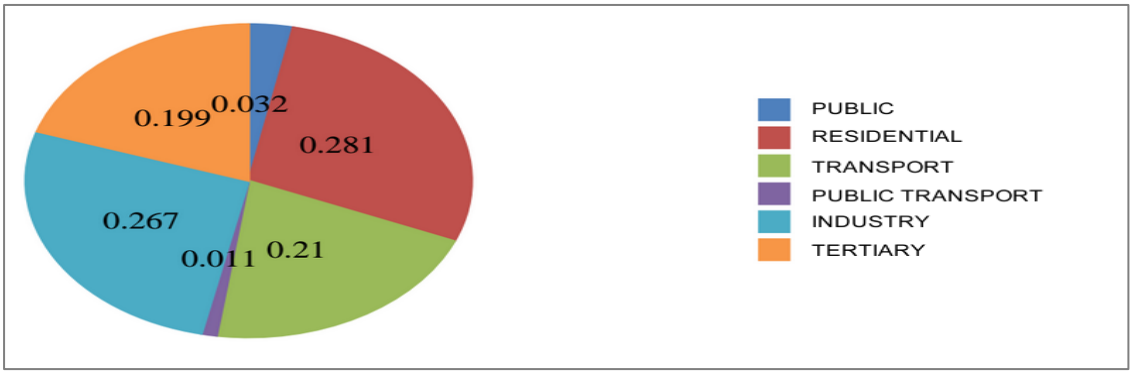
Besides the infrastructural interventions which involve the construction of a city belt, the enlargement of the main streets adding lanes, the creation of bicycle paths and the optimisation of the public transport, the main measure regards the promotion of electric vehicles; the switch to electricity to fuel the transport sector is due to many reasons mainly connected to the possibility of producing the power needed by renewable energies in a way that the transport in the city centre will be less pollutant and noising.

Based on the experience of large urban centres, the best solution to solve the problems of environmental pollution is the electric vehicle, as alternative transport mode. That is why, in the last twenty years, the electric vehicle has been rediscovered. Although the advantages and benefits for environmental protection are huge, electric vehicles did not trigger a revolution because:

- Procurement costs are higher;
- The re-charging infrastructure for these transport modes does not exist;
- The population is not educated in the spirit of energy efficiency and the use of transport modes with low environmental impact.

Suceava Municipality shares the principles of Europe 2020 Strategy with regard to the efficient use of renewable resources and increasing the quality of life of citizens. The quality of life is closely linked to the quality of socio-economic infrastructure of the town, improving the living standards involves improving energy efficiency and intelligent use energy.

According to calculations in the SEAP for 2005, CO_2 emissions on sectors are as follows:



Sector	t/an	%
PUBLIC	17.024,86	3,2%
RESIDENTIAL	150.081,51	28,1%
TRANSPORT	112.035,05	21,0%
PUBLIC TRANSPORT	6.064,48	1,1%
INDUSTRY	142.827,10	26,7%
TERTIARY	106.301,08	19,9%
TOTAL EMISSION	**534.334,07**	**100,0%**

Suceava baseline: sectorial emisiions in % related to 2005

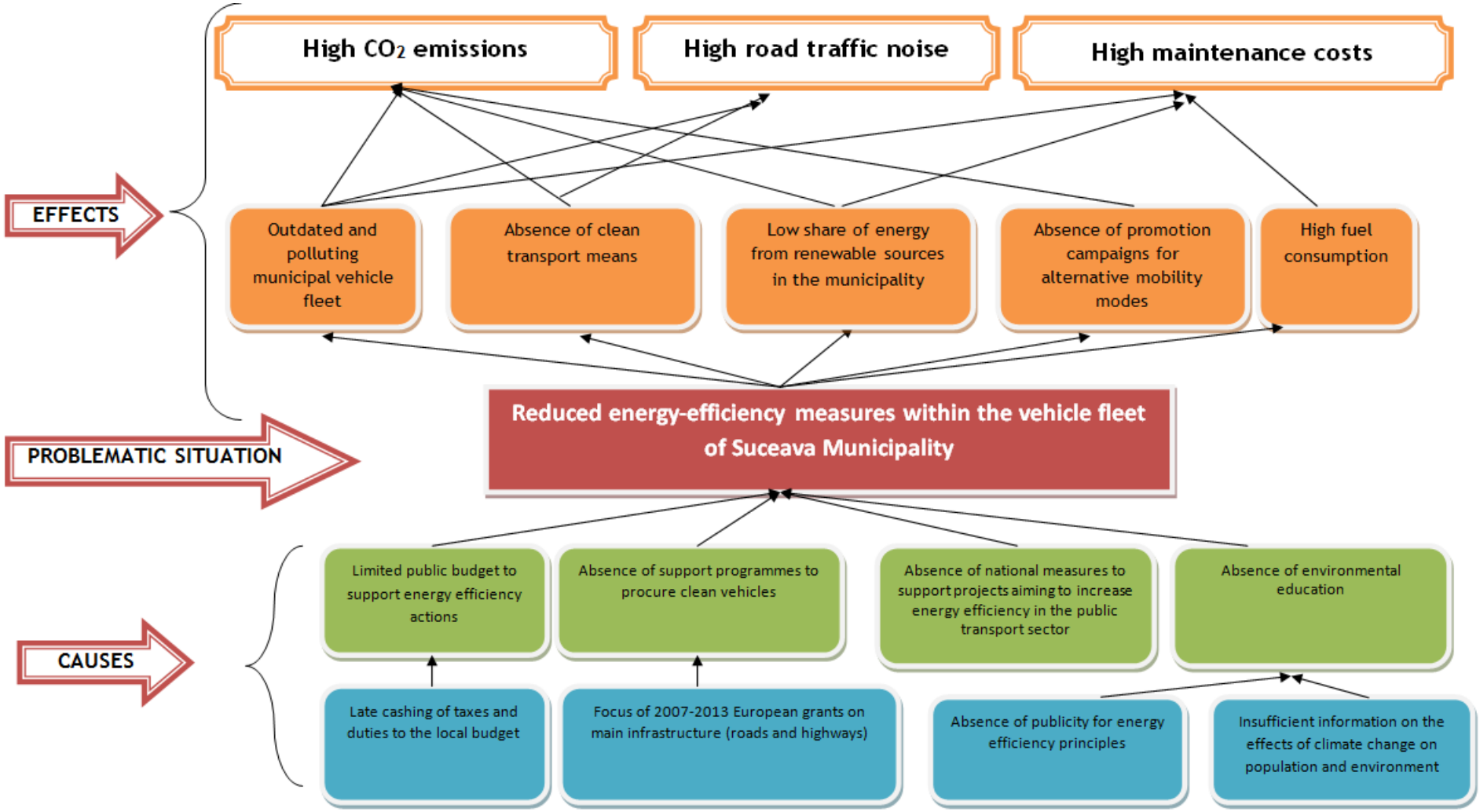
În 2005, the total emissions were 534,334 CO_2, out of which 118,099tCO_2 in the mobility/transport sector.

According to SEAP, the **Mobility/ Transport sector** includes three sub-categories:

- **„Municipal fleet",** including vehicles owned and used by the local authority/ administration and related organizations;
- **„Public transport"** (buses, minibuses);
- **„Private and commercial transport",** which includes the overall road and railway transport in the territory of the local authority other than specified above (road and merchandise transportation).

Due to the saving measures considered in the SEAP, Suceava Municipality plans to meet an ambitious target per overall sectors in 2020, **reducing CO_2 emissions by approximately 50%.**

Based on the current situation of Suceava Municipality in terms of energy efficiency and in order to establish the cause-effect relationship between the existing problems, the graphic problem tree was drawn up:


High CO_2 emissions
High road traffic noise
High maintenance costs
EFFECTS
Outdated and polluting municipal vehicle fleet
Absence of clean transport means
Low share of energy from renewable sources in the municipality
Absence of promotion campaigns for alternative mobility modes
High fuel consumption
PROBLEMATIC SITUATION
Reduced energy-efficiency measures within the vehicle fleet of Suceava Municipality
CAUSES
Limited public budget to support energy efficiency actions
Absence of support programmes to procure clean vehicles
Absence of national measures to support projects aiming to increase energy efficiency in the public transport sector
Absence of environmental education
Late cashing of taxes and duties to the local budget
Focus of 2007-2013 European grants on main infrastructure (roads and highways)
Absence of publicity for energy efficiency principles
Insufficient information on the effects of climate change on population and environment

Starting from the effects generated by the main problem, the following needs have been identified within Suceava Municipality:

- **The need to reduce CO_2 emissions**(12% of CO_2 emissions are generated by cars);
- **The need to reduce dependence on non-renewable resources** (cars generate 25% of the world oil consumption);
- **The need to reduce ambient noise** (in 2011, in the municipality, the maximum allowable levels were exceeded in all locations were APM (Environment Protection Agency) had placed equipment to monitor the quality of environment[1]);
- **The need to change the mentality of current or future owners of standard cars**, in view of partial and gradual replacement of conventional vehicles with other types of engines, namely electric ones as well as alternative transport modes, such as electric bikes;
- **The need to contribute to environment protection.**

Starting from the needs identified in the municipality, and taking into consideration the European, national and regional context, as well as the view on development of Suceava Municipality, namely the desire to become a „green" town, the Municipality aims to develop a pilot electro-mobility system.

The implementation of the pilot electro-mobility system will contribute to:

- **Reduced CO_2 emissions into the atmosphere** and reduced conventional fuel consumption, by procuring 15 zero-emission electric vehicles and replacing the current ones in the polluting and obsolete vehicle fleet of the Mayoralty
- **Supporting the use of green (electric) transport modes** in Suceava Municipality and increased trust of citizens in the reliability of the new EV technology:
  - **the electric transport is clean, silent and safe,** contributing thus to improving the quality of life for citizens in Suceava Municipality;
  - Electric vehicles meet the urban daily travel needs, which do not normally exceed 100 km/day;
  - Electric vehicles reach maximum speeds similar to classic vehicles, but they accelerate faster and very smoothly;
  - Ensuring easy access to using the EV charging infrastructure;
  - The charging equipment is safe, easy to install and easy to use;
  - **Low maintenance costs** due to construction simplicity, compared to classical vehicles;
  - **The operating costs are much lower than for conventional vehicles**.
- **Stimulating the use of electric vehicles,** by:
  - Setting up an infrastructure including 28 charging points in public places, out of which 14 standard charging points and 14 fast charging points;
  - Implementing a bike charging and renting system (e-docking) for 10 electric bikes;

[1] Report on environment condition in Suceava County in 2011, www.apm.ro

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  - Energy autonomy by implementing renewable energy sources to feed the electric bike charging system - 1 photovoltaic charging system for bikes;
  - Setting up 56 parking spaces for electric vehicles.
- **Changing the mentality** of current and future vehicle owners, in view of partial and gradual replacement of conventional vehicles by EV (electric vehicles) and alternative transport modes (electric bikes);
- **Providing a model of good practice** for other local, regional and national public institutions – no other municipality in Romania had adopted the EV technology;
- **Promoting a modern, sustainable, less polluting, energy efficient and cost-efficient transport**;
- Integrating the new electro-mobility system in ampler urban planning aspects and undertaking collateral investments in the public transport sector in Suceava metropolitan area *(Strategic projects 2014-2020 - "Implementing a new green public transport throughout the metropolitan area of Suceava and setting up a photovoltaic park to generate renewable energy").*

The project that is being implemented by Suceava Municipality: "ELECTROMOBILITY – ELECTRIC VEHICLES FOR A „GREEN" MUNICIPALITY" aims to implement a pilot electro-mobility system in Suceava, including:

- EV charging infrastructure, namely 28 charging points, out of which:
  - 14 standard charging points – the standard charging points will be primarily located where the electric vehicles procured by the municipality will be parked, at the headquarters of institutions they are assign to;
  - 14 fast charging points – with a charging duration of maximum 2 h (depending on the features of the electric vehicles); the network will be placed on the public domain of the municipality, in the most crowded urban areas;
- 15 electric vehicles procured in view of equipping the vehicle fleet of Suceava Municipality, out of which:
  - 11 electric cars;
  - 2 electric vans;
  - 1 utility vehicle - electric sweeper;
  - 1 utility vehicle - electric tanker;
- 56 specially-arranged parking spaces intended for electric vehicles, which will be placed next to the charging points.
- Infrastructure for charging and renting electric bikes (e-docking). The electric bikes charging infrastructure will be supplied by photovoltaic panels;
- 10 electric bikes which can be rented by inhabitants of Suceava Municipality and also by tourists in the area.

The implementation of the pilot electro-mobility system will contribute to:

- **Reduced CO_2 emissions into the atmosphere** and reduced conventional fuel consumption, by procuring 15 zero-emission electric vehicles and replacing the current ones in the polluting and obsolete vehicle fleet of the Mayoralty

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- **Supporting the use of green (electric) transport modes** in Suceava Municipality and increased trust of citizens in the reliability of the new EV technology:
  - **the electric transport is clean, silent and safe,** contributing thus to improving the quality of life for citizens in Suceava Municipality;
  - Electric vehicles meet the urban daily travel needs, which do not normally exceed 100 km/day;
  - Electric vehicles reach maximum speeds similar to classic vehicles, but they accelerate faster and very smoothly;
  - Ensuring easy access to using the EV charging infrastructure;
  - The charging equipment is safe, easy to install and easy to use;
  - **Low maintenance costs** due to construction simplicity, compared to classical vehicles;
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- **Stimulating the use of electric vehicles,** by:
  - Setting up an infrastructure including 28 charging points in public places, out of which 14 standard charging points and 14 fast charging points;
  - Implementing a bike charging and renting system (e-docking) for 10 electric bikes;
  - Energy autonomy by implementing renewable energy sources to feed the electric bike charging system - 1 photovoltaic charging system for bikes;
  - Setting up 56 parking spaces for electric vehicles.
- **Changing the mentality** of current and future vehicle owners, in view of partial and gradual replacement of conventional vehicles by EV (electric vehicles) and alternative transport modes (electric bikes);
- **Providing a model of good practice** for other local, regional and national public institutions – no other municipality in Romania had adopted the EV technology;
- **Promoting a modern, sustainable, less polluting, energy efficient and cost-efficient transport**;

Moreover, the project will contribute to meeting the following development directions set forth at European level and which Romania will align to:

- **Sustainable development**: both by setting up a silent and clean pilot electro-mobility system and by paying attention to the needs of citizens, in the context of integrated development of the municipality;
- **Energy efficiency**: by reducing the fuel consumption as a result of procuring 15 electric vehicles for the vehicle fleet of Suceava Municipality and by setting up of a photovoltaic panels system to supply the electric bikes charging and renting system;
- **Environment protection**: by reducing CO_2 emissions and the level of ambient noise in Suceava Municipality.

According to the survey results carried on in Suceava (WP 2 by D.2.1), the common mobility aspects in Suceava are:

Non pilot city	Suceava

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Mobility aspect	**Main attractor places**	City centre Famous monuments University Airport Museums Shopping centres and malls
	Day time slot when trips increase	Morning (59%) Noon (44% resident , 40% tourists)
	Raison	Work Shopping School
	Main Transport mean	Public transport - 56% Walking – 22% Private car 21%

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2. SWOT ANALYSIS OF THE INTRODUCTION OF ELECTRA MODEL

S – Strengths	W - Weaknesses
- The obligation to implement EU policies aimed at achieving environmental targets imposed by the EU Member States - Introducing EV is a rational way to improve quality of life, due to low level noise and CO2 emissions - The experience of Suceava Municipality and local partners in formulating strategies for development and implementation of projects - The openness shown by the private sector to EV introduction - EV attractiveness in terms of cost of use, once the vehicle was purchased	- High cost investments: EV charging and power payment systems - Absence of any specific operating systems for EVs - Reduced range of EVs - Low income of the population - Lack of consistent policies for financing and promoting EVs at national level - National legislation granting only one financial facility when purchasing which is not enough to attract buyers of EVs - Local policies that do not include measures to lower the tax for EVs Lack of interest among local electricity distribution companies - Lack of appropriate advertising of environmental policies - Lack of appropriate environmental education and public accountability
Opportunities	**Threats**
- The emergence of EU grants and other funding sources for innovation in environmental protection and sustainable development planning in the medium and long term - Continuous development and innovation in technology - Creating new business opportunities - The existence of multiple opportunities for obtaining electricity from renewable sources used in EV propulsion	- Continue the urban agglomeration with vehicles and charging stations - Increase the quantity of hazardous waste due to inappropriate recycling of batteries and continuous increase in the cost of disposal / neutralization of waste - Increase the risk of road accident due to the very low noise level - Increase air pollution where electricity is produced from conventional sources

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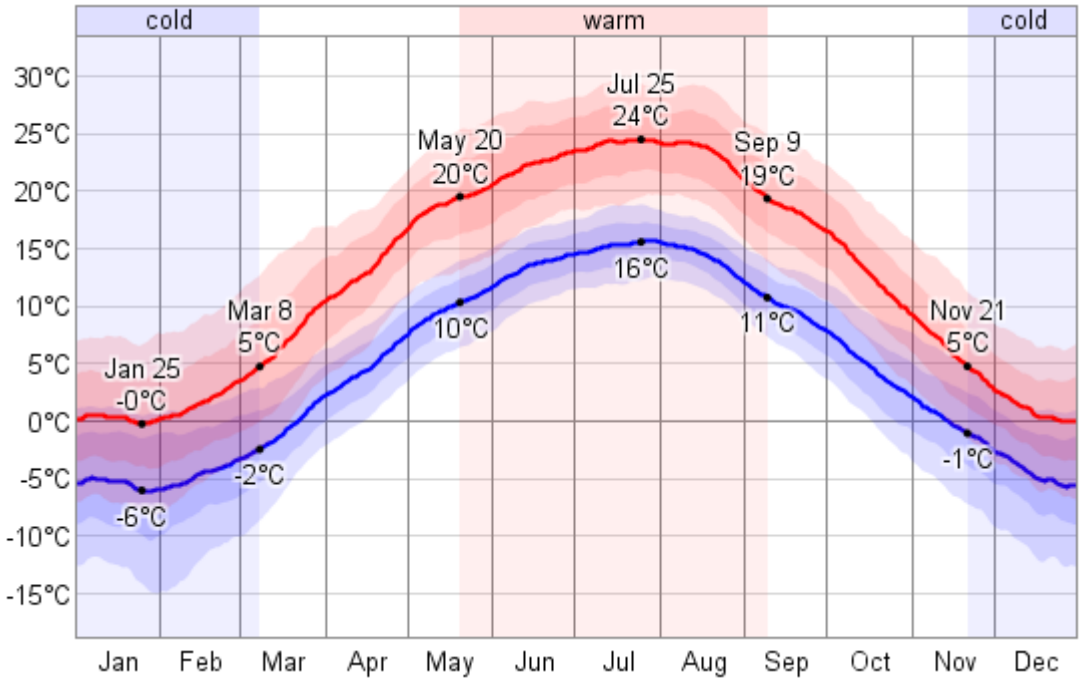
- Considerable decrease of conventional fuel resources and the continuous increase in the unit price for conventional fuels	- People's reluctance to new

2.1. SCOOTER SHARING SYSTEM

Suceava has no scooter sharing system at present due to the fact that the climate does not allow the scooters to be used all over the year. Suceava has a humid continental climate with warm summers and no dry season. Over the course of a year, the temperature typically varies from -6°C to 24°C and is rarely below -15°C or above 30°C.

Daily High and Low Temperature



The warm season lasts from May 20 to September 9 with an average daily high temperature above 20°C. The hottest day of the year is July 25, with an average high of 24°C and low of 16°C.

The cold season lasts from November 21 to March 8 with an average daily high temperature below 5°C. The coldest day of the year is January 27, with an average low of -6°C and high of -0°C.

Fraction of Time Spent in Various Temperature Bands

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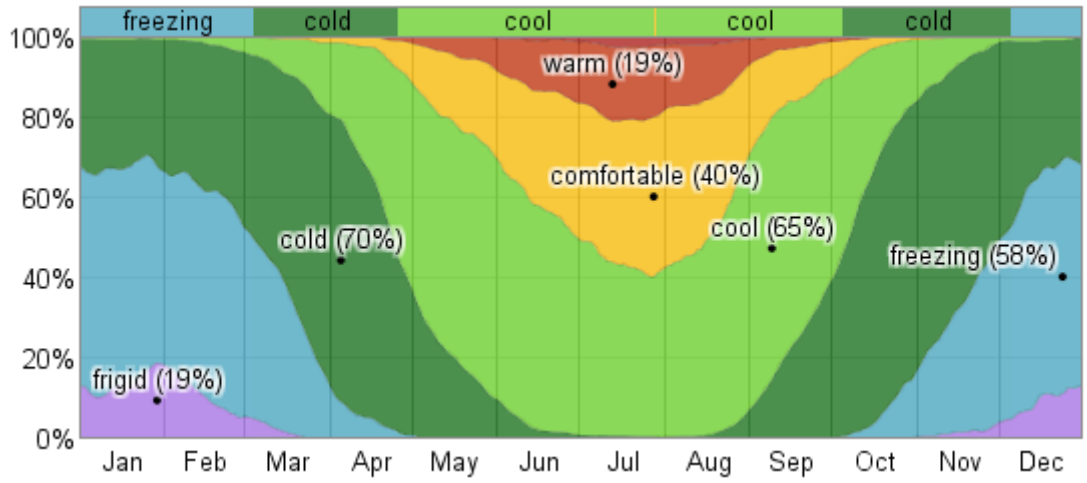

The average fraction of time spent in various temperature bands: frigid (below -9°C), freezing (-9°C to 0°C), cold (0°C to 10°C), cool (10°C to 18°C), comfortable (18°C to 24°C), warm (24°C to 29°C), hot (29°C to 38°C) and sweltering (above 38°C).

2.2. PRIVATE OWNERS OF E-LIGHT VEHICLES

There are no private owners of e-light vehicles in Suceava, but in order to encourage the owners to buy and use these kind of vehicles, the following incentives could be implemented:

a. **DIRECT INCENTIVES** - that have a direct monetary value to consumers, reducing payments electric vehicle owners would otherwise have been required to make.

The direct incentives that we consider in this study are purchase subsidies, license tax/fee reductions, Electric Vehicle Supply Equipment (EVSE) financing, free electricity and free parking.

Purchase subsidies are usually offered in the form of tax credits and rebates, either for electric vehicles specifically or for alternative fuel vehicles (AFVs) generally. Subsidies generally impact both buying and leasing. In the case of leasing, the subsidy stays with the leasing company, and in most cases, it has been factored into the cost of the lease to benefit the customer.

License tax and fee reductions - this category includes license tax reductions and registration fee reductions.

EVSE financing - many states offer subsidies for home chargers and public chargers in the form of tax credits, rebates, and grants. Generally, a state covers a percentage of the cost, capped at a certain amount. Some states subsidize both hardware and installation cost, while some only subsidize hardware or only installation cost.

Free electricity - When charging at a charging station, electric vehicle owners often benefit from free electricity that they otherwise would have paid for at home, especially when using a charger owned by the city.

Free parking - provide free parking for electric vehicles.

b. **INDIRECT INCENTIVES -** are those that do not have a direct monetary value to the consumer. Rather, these incentives save time and provide convenience, which are sometimes much

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valued by consumers. Indirect incentives include access in the city center, access in restricted areas and public charger availability.

2.3. BUSINESS OWNERS OF E-LIGHT VEHICLES

There are no business owners of e-light vehicles in Suceava, but in order to encourage the owners to buy and use these kinds of vehicles, the following incentives could be implemented:

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b. **INDIRECT INCENTIVES -** are those that do not have a direct monetary value to the consumer. Rather, these incentives save time and provide convenience, which are sometimes much valued by consumers. Indirect incentives include access in the city center, access in restricted areas and public charger availability.

Suceava municipality has started a project financed through URBACT III - *Freight TAILS: Tailored Approaches Implementing Lasting Solutions.*

Significant activity has gone into encouraging sustainable transport opportunities (walking, cycling, public transport) alongside measures to restrain private car use. However, freight and logistics have been generally only been dealt with in a fragmented way even though they are a significant component of overall traffic movements. This project will establish whether different approaches to the on-going problem of delivery and servicing activity in urban areas, are required for different areas within cities, to achieve on-going real improvements in greenhouse gas emissions and therefore air quality and traffic management. Action plans will be established to develop sustainable urban logistics approaches (micro/consolidation, SME co-ordination, retiming deliveries, efficient

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road space allocation), in specific urban areas (areas of high multi-tenanted office blocks, high street retail areas, areas dominated by single user (university campus or public sector administration), historic central areas). Business cases for different approaches, data on green house gas emissions and traffic improvements, and recommendations for implementation will be key elements of the Action Plan.

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3. GUIDELINES FOR THE INTRODUCTION OF ELECTRA MODEL

3.1. POLITICAL AND LEGISLATIVE SUPPORT

In an increasingly global context, Romania's energy policy is made up according to national and European changes and trends. In this context, Romania's energy policy must be correlated with similar existing European documents in order to ensure the compliance of our country's policy to that of the European Union.

In March 2010, the European Commission launched **Europe 2020 Strategy** in view of fighting the crisis and preparing EU economy for the following decade. Therefore, the Union set five major objectives – employment, innovation, education, social inclusion and environment / energy – which must be met by 2020.

Romania adopted its own national objectives in these fields. In the environment/ energy field, they are as follows:

EU 27 Objectives	Romania Objectives 2020		
	Initial value (2008)	Preliminary value	Final value
Energy and climate changes (20/20/20)			
Greenhouse gas emissions reduction - 20 %	-	20%	20%
Percentage of renewable energy in the final consumption - 20%	-	24%	24%
Increased energy efficiency - 20%	-	10 - 12% if limited to the definition used in the Directive 2006/32; 20% if it is not limited to that	19%

Romania's energy strategy for 2011 – 2020 aims at meeting the main objectives of the new energy – environment policy of the European Union, to which Romania committed.

The main actions included in the Romania's energy policy, in compliance with those set by the European Union, are as follows:

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- Selecting a balanced energy mix, which can ensure the energy sector competitiveness and supply security, **with a stress on using internal resources,** namely coal, the economic hydro-energetic potential, nuclear energy and renewable sources of energy;
- **Efficient management and rational usage of primary finite energy sources from Romania** and maintaining an acceptable economically and in terms of security) level of primary energy source imports (limited / controlled dependency);
- **An increased energy efficiency for the overall process: extraction – production – transport - distribution - consumption;** Romania can no longer afford to waste energy considering the limited existing amounts and the increased energy costs; **energy efficiency is the most profitable method to reduce emissions, to improve security and competitiveness and to reduce the energy services bills;**
- Promoting the usage of renewable energy sources, according to the practices of the European Union, according to the National Renewable Energy Allocation Plan elaborated in 2010;
- Creating market conditions which could boost larger energy savings and **increased investments in low carbon emissions technologies**;
- **Facilitating investments for projects which contribute to meeting the objectives set for 2020 according to EU policy;**
- **Meeting the environment protection and greenhouse gas emissions reduction objectives.**

National legislation includes two levels:

- Primary legislation: laws adopted by Parliament, Government ordinances and decisions.
- Secondary legislation (issued by specialized bodies): orders and regulations issued by competent regulatory authorities.

In addition to these two levels, the European Union's legislation is applicable as well.

The legislative framework of the energy and environment sector was developed and adapted to the European community legislation in the field, in view of Romania's accession to EU and then as a member state, but also in the process of shifting to a functional market-based economy.

There are in force laws regarding electric energy, natural gas, mines, oil, nuclear activities, public energy efficiency management services in view of establishing a system which can promote energy production from renewable energy and high-efficiency cogeneration, all in compliance with the EU legislation in the field.

With regard to the energy production sector, the community legislation on environment protection was completely committed to, being under implementation the provisions of Directive 2001/80/EC on large combustion plants and Directive 1999/31/EC on the landfill of waste.

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The development of the electric energy production sector must be correlated with the legislative requirements in the field of environment, which entails adopting specific measures, mainly referring to:

- Undertaking the necessary environment investments in view of observing the provisions of Directive 2001/80/EC on the limitations of emissions of certain pollutants into the air (SO2, NOX and dust) from large combustion plants and of Directive 1999/31/EC on the landfill of waste;
- Observing the provisions of Directive 96/61/EC concerning integrated pollution prevention and control;
- reducing GHG emissions (CO_2) for 2008-2012, in view of observing the certified GHG emissions rates allocated via the National Allocation Plan.

In view of reaching the national objectives in terms of climate change, time horizon 2020, the necessary measures which must be adopted are in compliance with the **Memorandum "Approval of the final values for Romania's objectives deriving from Europa 2020 Strategy",** signed by the Romanian government on June, 8th 2010.

The main measures refer to the following:

- the development of the institutional capacity in the field of energy and climate change;
- reduction of greenhouse gas emissions (GHG) by promoting carbon capturing and storing technology (CCS);
- increased percentage of energy from renewable sources in the final energy consumption;
- increased energy efficiency.

Romania's energy strategy for 2011 – 2020 stipulates a series of specific measures which will be adopted in view of meeting key objectives:

a) Environment protection:

- Undertaking investments in the field of environment protection;
- Inclusion of environment-related costs into the energy price;
- Compliance of the district heating and power stations to the requirements of Directive 2001/80/EC on the limitations of emissions of certain pollutants into the air (SO2, NOX and dust) from large combustion plants and Directive 96/61/EC concerning the integrated pollution prevention and control;
- Observance by the district heating and power stations of the greenhouse gas emissions rates provisioned in the National plan for allocating greenhouse gas emissions certificates for 2008 – 2012, exceeding the rates being acceptable only upon buying certificates and consequently paying a higher price for the electric energy supplied;
- Preparing the district heating and power stations for the period of purchasing 100% of the needed greenhouse gas emissions certificates, irregardless of derogations provisioned in art.10c of Directive 2009/29/EC being applicable or not;
- Intensifying the use of the flexible mechanisms stipulated in the Kyoto Protocol;

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- Promoting clean technologies, technologies for capturing and storing CO_2 from coal burnt gases, combustion cells and using hydrogen as energy vector;
- Promoting the usage of household and industrial waste to produce electric and thermal energy;

b) Energy efficiency:

- Increased efficiency in the electric energy and natural gas usage in industry, carrying out pilot project to attract investments intended for the modernization of equipment and technological machinery;
- Continuing investments for the rehabilitation of the centralized heat supply systems in towns and reducing energy loss;
- Thermal rehabilitation of existing residential buildings;
- Carrying out pilot energy efficiency projects and areas;
- Granting fiscal and financial incentives for undertaking energy efficiency projects, in observance of legal conditions on state subsidy.

Directive 2006/32/EC on energy end-use efficiency and energy services which is mandatory for Romania starting from 2008, stipulates that EU member states commit to reduce the energy end-use consumption by at least 9% in a period of nine years (2008-2016) compared to the average consumption in the last five years for which data are available (2001-2005).

In this sense, the following measures will be taken in terms of energy efficiency:

- Using financial instruments for energy savings, including energy performance contracts which stipulate the provision of quantifiable energy savings;
- Procurement of equipment and technologies having primarily in view the energy efficiency specifications;
- Speeding up the process of energy auditing the industrial consumers, public and residential buildings; the audits must be certified by the authorised bodies and must be followed by measures of reducing energy consumption.

The national energy saving potential, namely reducing energy loss, is approximately 27 – 35 % of the primary energy resources (industry 20 - 25%, buildings 40 – 50%, transport 35 – 40%).

In order to reduce energy intensity in high energy-consumption sectors and in order to meet the targets set in the National Energy Efficiency Strategy and in the Energy Efficiency Action Plan corresponding to Directive 2006/32/EC on energy end-use efficiency and energy services, measures will be taken in the transport sectors:

- increased quality of public transport in view of discouraging private car transport;
- extending public transport by adding new routes;
- traffic and parking efficiency;
- public transportation for employees, secured by employer companies;
- an increased development of urban railway transport (trams, trolley-buses);
- increased vehicle energy efficiency by setting minimum efficiency criteria;

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- instating regulations to support the most efficient and environment friendly vehicles;
- using gas fuels and bio-fuels for transportation.

For the realization of the above mentioned measures, an important component is educating the population in view of their large-scale acceptance and observance.

Sustainable transport is a complex system intended to secure the mobility needs for the present generations without damaging the environment and health. Until recently, industry was considered the main polluter of the planet. The accelerated development of transport and especially the magnitude of vehicle manufacturing changed the balance of toxic substances and unpleasant effects, as transport became the main source of aggression against the environment and human health.

Considering that Romania, as EU member state, is bound to implement EU Directives, an ordinance was adopted which coerces contracting authorities subject to GEO 34/2006 and public services operators to consider, upon the procurement of road transport vehicles, the life-long energy and environment impact, which includes energy consumption, CO_2 and NOx emissions, NMHC and particles, so that the purchasing price would reflect all costs.

The newly-introduced incentive aspect upon selling hybrid and electric vehicles consists in receiving subsidies under "**The Programme of stimulating the renewal of the national car fleet",** which also apply to Beneficiaries who want to purchase a vehicle outside the programme, born by The Environment Fund.

The provisions of article 9 of the EO 40/2011 are implemented by means of **"The Programme of Stimulating the renewal of the national car fleet"** ("Rabla" programme) managed by the Ministry of Environment and Forests, through the Environment Fund Management; under this programme, compensatory vouchers are provided for vehicles older than 10 years which are taken out of use, in exchange for purchasing a new vehicle, with reduced polluting emissions.

In Romania, the transport policy aims to set the national transport system in line with the principles of the Community Transport Policies defined in the White Paper on transport (updated accordingly) and Romania's sustainable development requirements.

National policies for promoting clean and energy-efficient road transport vehicles

In order to reduce emissions from the transport sector, Directive 2009/33/EC of the European Parliament and Council was implemented on April 23rd, 2009 and aims at promoting clean and energy-efficient road transport vehicles and improve the transport sector's contribution to EU policies on environment, climate and energy, which require Member States to apply at least one of the following options:

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- setting technical specifications for energy and environmental performance in the documentation for the purchase of road transport vehicles on each of the impacts considered, as well as other aspects of environmental impact;
- include energy and environmental impact in the purchasing decisions in the sense of using these impacts as award criteria, where a procurement procedure is applicable.

Transposing this Directive into Romanian legislation was made through the Emergency Ordinance no. 40 of April 20th, 2011 on the promotion of clean and energy-efficient electric vehicles.

Given that Romania as an EU member state must implement EU Directives, the Romanian State approved the ordinance requiring contracting authorities covered by the Government's Emergency Ordinance no. 34/2006 and public service operators to consider, when purchasing road transport vehicles, the energy and environmental impact in their entire lifetime in the form of energy consumption, CO2 and NOx emission, NMHC and particulate; thus the purchase price reflects all costs.

The encouraging and stimulating condition newly introduced for the sale of hybrid and electric vehicles consists in offering grants under the "Program for National Fleet Renewal Stimulation" also to recipients who wish to purchase a vehicle outside this program, paid by the Environment Fund. In the same piece of legislation, the Annex contains the data set to calculate the lifetime costs linked to the operation of vehicles: costs of emissions from road transport (euro / g), the energy density of motor fuels (MJ/l) and lifetime mileage of road transport vehicles, categories M1 and N1 (km).

"Grants from the Environmental Fund consist of discounts in the retail price of motor vehicles and financing sessions. The amount of the discount is up to:

Art. 9 – Natural persons, municipalities and public institutions who give away used vehicles for scrapping within the Incentive program for national fleet renewal in 2011 benefit from a total number of 4 vouchers, as follows:

a. 2 vouchers for purchasing a hybrid vehicle in exchange for a used vehicle to be scrapped
b. 4 vouchers for purchasing an electric vehicle in exchange for a used vehicle to be scrapped.

Art.10 (1) Natural persons, territorial and administrative divisions and public institutions who do not take part in the Incentive program for national fleet renewal, but acquire hybrid or electric vehicles, benefit from:

a. A discount of up to 10% of the selling price (VAT included) of the purchased hybrid vehicle, but no more than 1.800 Euros (...)
b. A discount up to 20% of the selling price (VAT included) of the electric vehicle purchased, but no more than 3.700 Euros. (...)"

The provisions of Art. 9 of the Emergency Ordinance no. 40/2011 are implemented through the "Program for National Fleet Renewal Stimulation" ("Rabla" scrappage scheme) managed by the Ministry of Environment and Forests through the Environmental Fund Administration, which grants compensatory vouchers for vehicles older than 10 years removed from service in exchange for buying a new vehicle with lower emissions. This program has the following objectives:

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- reducing the negative effects of air pollution on human health and environment in urban areas as a result of exhaust emissions from cars, with very high levels of pollution;
- limit these emissions to the values allowed at European level for the ambient air;
- prevent the formation of waste as a consequence of used cars abandonment and reach the targets set by the EU environmental acquis on recovery and recycling of waste from used vehicles.

The Order no. 981 / March 7th, 2012 approves the Financing Guide of the Program for National Fleet Renewal Stimulation and regulates eligible participants: natural persons, local government, public and private academic institutions, NGOs, religious establishments and economic operators.

3.2. CONSTRAINTS FOR THE DEVELOPMENT OF THE ELE.C.TRA MODEL

Suceava municipality lays NE of Romania, north of region Moldavia, being the capital city of Suceava County. It is located 450 km from Bucharest and it stands at an important road junction, crossed by two European roads, five national roads and four county roads.

Suceava County is crossed by two major European roads: E85 Bucuresti – Suceava - Siret and E58 Halmeu – Suceava – Iasi, both passing through Suceava City and City Centre, as Suceava has no by-pass routes that would permit the diversion of transit traffic.

This transit traffic superposes on the local urban traffic, already significantly exceeding the current possibilities offered by the city road infrastructure, and **raises the negative impact of the general traffic.**

The streets network of the city is the result of the city development as a traffic junction and administrative, economic and cultural centre of the county and of national importance. Another important factor for the evolution of street configuration is the area relief, respective Low Carpathians – highland.

The total length of the street network is about 138 km, classified as following:

- 22 km – major roads that ensure the taking over of the major traffic flows resulting from the main European roads crossing Suceava, accounting for 16% from total;
- 17 km – roads ensuring connection, accounting for 12 % from total;
- 34 km - collecting roads, accounting for 25% from total;
- 65 km - suitable for local and minor use and non-modernised streets, accounting for 47%.

The last three categories aren't appropriately dimensioned to serve the motorised traffic demand and to respond the pressure and as a result the traffic is affected, the fluency reduced, the trip duration increased, the fuel consumption, level of pollution, stress and the number of incidents enhanced. Also, the 4th category accounts for nearly 50% and these only ensure accessibility to

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residences and services of common use, without representing a feasible solution for driving across the city.

This road network is used by three categories of traffic: domestic, penetration and transit traffic. Only 10 streets have two lanes, these ones being the most circulated.

An important aspect in finding solutions to solve road traffic and congestion issues is the initiative of the local administration to take steps for building two bypasses (one west and one east) to divert the transit traffic and the heavy traffic from the city residential areas and the city centre. The city bypass to west was finalised in 2014.

The street network is a limited resource, for which there already is competition for certain hours and in certain places. *The pressure regarding the road utilisation is increasing, so in order to obtain a good utilisation of the traffic system, the utilisation means have to be very well administrated.*

The main options of the political authorities are linked to priority actions for the public transport (priority lines, physically separated lines where available, priority at traffic lights, crossing priority before other traffic), price strategies for parking in the central area, priorities and facilities for "easy" transport means, including the creation of passengers areas, bike roads and crossing facilities, the use of intelligent transport systems for administration of traffic control systems for optimisation of the traffic flows.

To solve the urban traffic issues, the undertakings are much more complicated, diverse and must tackle the problem unitary. **CIVITAS II – SMILE project came with concrete measures to decrease the motorised traffic** by increasing the use of public transport means, to promote the use of clean vehicles and alternative fuel, to urge the citizens to make use of alternative means of transportation – especially walking, to plan the trips and to integrate the available mobility systems.

At the opposite side, stood the challenge posed by the positive trend of the local economic development and the improved financial status of the inhabitants, the public mentality according to which private car ownership is seen as a matter of standard of living and wellbeing.

Barriers for application of Electra model in Suceava are:

- Weather;
- Street configuration is the area relief, respective Low Carpathians – highland;
- High cost of the vehicles compared to conventional ones;
- Actual lack of charging points;
- People are unfamiliar with electric vehicles, are uncertain about their costs and benefits, and have diverse needs that current electric vehicles might not meet.

Challenges for application of Electra model in Suceava are:

- The level of investment needed for setting up charging facilities could be prohibitive and result in a slow response;
- The introduction of electric vehicles needs to be done at national scale to replace older cars;
- The price of electric vehicles and the need to buy new cars are serious impediments;
- Insufficient parking infrastructure available, resulting in congestion on road and pavements as they are used for parking.

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According to the survey results carried on in Suceava (WP 2 by D.2.1), the critical points in Suceava are:

Non pilot city	Suceava
CRITICAL POITS	▪Large increase in the number of motor vehicles ▪Absence of parking lots ▪Polluting transit traffic ▪Traffic (50%) ▪Too long travel time with PT (25 minutes in average) ▪Buses too crowded (37%) ▪Parking shortage (32%)
MOTOR VEHICLES	▪3% of residents possess a motorcycle or a scooter ▪low information level regarding alternative solution to use vehicle
FOSCUS ON EV	▪**93% never used an EV** ▪**50% would be interested** in testing or buying EV ▪Lack of information ▪**Solutions more chosen:** complete ownership (42%), sharing (20%), leasing (19%) ▪ Type of EV needed in Suceava – 45% e-cars, 27% e-buses, 14% e-bikes, and only 6% e-scooters ▪**Incentives**: no pollution tax + no local tax (56%), discounts for purchase (47%), ecobonus (38%). ▪**Solution most chosen**: complete ownership (53%)
ELECTRIC VEHICLES PERCEPTION BY CITIZENS	▪**Strengths**: comfort, safety ▪**Weaknesses**: charging (36%), being stolen (24%), lack of knowledge on how to use it (23%), parking (20%), cost ▪**Critical issues**: infrastructure (no charging points), very low information level ▪**Benefits**: no carbon emissions (65%), lower noise (58%), fuel costs (54%)
SUSTAINABLE MOBILITY PRIORITIES	▪**Sustainable (green) transport** infrastructure - (33%) ▪**Different motorization** (electric, hybrid) (28%) ▪**Sustainable mobility** (walking, bike, car sharing) (20%)

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CONSTRAINTS	▪Increase in car traffic: traffic network congestions, traffic jams and long trip to destination ▪Incoherent cycling lanes ▪Lack of parking spaces, no parking spaces for scooters ▪Lack of pedestrian zones ▪Narrow streets, without the ability for expansion ▪Lack of public awareness and information campaigns on sustainable mobility ▪Lack of charging infrastructure ▪Lack of use on EV

3.3. POSSIBLE SOLUTIONS FOR THE CRITICAL ISSUES

The member states acknowledged the difficult challenges and the need for a joint approach on European energy. The security of energy supply, the efficient usage of resources, affordable prices and innovative solutions are crucial for the long-term sustainable growth, for creating jobs and improving life quality in the European Union.

These targets can only be met through joint action involving a coordinate effort on all levels: European, national, regional and local.

The crucial role of regions and towns in meeting these targets is already clearly acknowledged by the European Commission and by the European Parliament; these are the main energy-related actors, if we take into consideration their responsibilities in terms of numerous activities connected to land use and planning, taxes, investments, public procurement, production and consumption.

Moreover, transport, houses, public buildings and public lighting infrastructure, which are planned by local and regional authorities or are under their responsibility, are fields where CO_2 emissions reductions and a significant energy saving can be realized.

Local and regional authorities play a leading role in terms of triggering individual behaviour change – essential condition for meeting the energy efficiency targets and also in launching and supporting local, regional, national and international activities and projects in compliance with the energy efficiency, environment protection and climate change fighting targets.

Local and regional authorities have already started to implement activities and initiatives which will contribute to meeting the European policy targets in terms of environment protection and climate change fighting.

Considering the important role of the local authorities in identifying and implementing adaptive measures at local level to fight climate change, a Sustainable Energy Action Plan of Suceava

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Municipality was elaborated, in view of raising the awareness of authorities and public, as well as producing a change in the behaviour of companies, institutions and population.

Therefore, Suceava Municipality submitted an application to *The Swiss-Romanian cooperation programme to reduce economic and social disparities within the enlarged European Union, Thematic focus area 4, Objective 1* and was selected for the elaboration of the Sustainable Energy Action Plan and the implementation of Electric Vehicles in Suceava – charging station of EV fleet.

Suceava Municipality is strongly involved in laying down sustainable development policies for Suceava Municipality, and improving the life quality of its citizens is a major concern.

Energy is a key element of sustainable development, therefore increased effort for an efficient production and consumption is a priority for Suceava Municipality, which assumed an active role in promoting energy efficiency and renewable sources of energy, and consequently fighting the effects of planet's global warming.

Therefore, Suceava Municipality elaborated a concrete action plan which will result in reducing energy consumption in all social economic sectors and in investments for the renewable energy systems in the municipality. The plan is "an open document", permanently amended and updated according to the changing circumstances and in line with the national and European energy strategy.

The reasons for adopting this strategy are the following:

- Correlating the local energy framework with the national and European ones;
- Better life quality;
- General contribution to town's attractiveness;
- Increased attractiveness for trade and industry;
- Supporting economic growth;
- Attracting investments;
- Compliance with the International and National Policies on Climate Changes.

Suggestions and proposals coming from the stakeholders involved:

	Romania
Benefits	No pollution associated with internal combustion engines, BUT EV still have environmental costs: electricity Lower costs of fuel and maintenance Reduction of emissions Improve fuel economy
Bottlenecks	Lack of charging infrastructure Lack of knowledge Low information level (and low current predisposition) regarding e-vehicle use and benefits for citizens

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	EV are too expensive, even if it has environmental benefits EV need too much time to recharge Limited lifespan of batteries
Promotion activities:	Promotion within students Test drives for students, residents and local distribution companies
Suggestions	Buying EV with rented batteries and developing new business of battery recharge station Buy EV for the municipality and promote e-mobility

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4. SYNTHESIS OF THE POTENTIAL USERS' NEEDS

According to the survey realized within Electra and the D.2.1 Report on Current mobility and network the interviews revealed the following data:

a. Residents in Suceava have limited transportation means and they use public transport as main mean of mobility within the city;

b. For more than half of respondents was generated a confusion as they associate the electric vehicle with the trolley, therefore **public awareness campaign on electric vehicles is needed, particular focus should be on benefits of EV vs. traditional vehicles;**

c. Economic and fiscal incentives are needed to motivate residents in buying electric vehicles especially considering the fact the Romanians high affinity for ownership is confirmed as 42% of the respondents considered the complete ownership to be suitable for the use of an electric vehicle *(No pollution tax and no local taxes for the owners will stimulate the population to use an electric vehicle daily, 6 out of 10 respondents mentioned that)*

d. Motorcycle/ scoter possession is rather low. 97% of the respondents did not have any of these types of vehicle; this could be due to the climate of Suceava (over 6 months of cold winter and heavy snow) that is a better fit for electric cars. Survey revealed the fact that the type of electric vehicle needed for Suceava is electric car (45%), bus (27%), bike (14%), while schooter was mentioned in a rather low percent (6%);

e. Suceava city has encounters the following barriers in using electric vehicles: no charging infrastructure, lack of knowledge regarding EV and lack of parking spaces, therefore investment in this area is needed.

As a conclusion to the ante-operam analysis, the results have highlighted the following main needs of the users:

- more information and awareness campaigns on electric mobility, with particular reference to the economic and fiscal incentives, the benefits of the electric vehicle;
- the need of charging infrastructure within the city;
- the need of infrastructure investment, such as:
  - more parking spaces for cars and special parking spaces for scooters;
  - more facilities for public transportation and effective interchange nodes, easing intermodality by combining transport means;
- need of traffic decongestion and pollution reduction.

4.1. SCOOTER SHARING SYSTEM

A number of both financial and non financial policies promoting the EV market uptake can be deployed by public authorities at a national and/or city level.

Included in the **financial incentives** there are:

- Direct subsidies on EVs purchase: discounts, no VAT);

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- Differentiated vehicle taxation (e.g. due to CO_2 differentiated vehicle registration and/or circulation tax;
- On a local level, policies such as free parking spaces (or differentiated parking tariffs).

The category of **non financial incentives** is also very diverse and the adequacy of these relies on the local conditions. Nevertheless, a few of non financial incentives are:

- Regulatory framework - positive discriminatory measures such as limited access to certain areas of the city (low or zero emission zones), eligibility for using restricted lanes e.g., bus or high occupancy lanes
- Capacity building

Regarding users' incentives, the ante – operam surveys identified some of the incentives that can be activated by public bodies, large-scale distributors and energy suppliers.

1) Discounts when buying an electric vehicle;
2) Governments incentives: eco-bonus, purchase incentives, exemption from local taxes, circulation taxes, pollution taxes;
3) free e-vehicle park where now there is park pricing with free e-charging, if possible. In this way, it's possible to guarantee certain parking time to commuters that use sustainable and environmental safeguarding vehicles, as e-scooters, in metropolitan areas;
4) free e-vehicle park and e-charging in private parks, also covered. In this way, the project will involve and raise private stakeholder awareness of sustainable mobility.
5) free e-charging given by large scale distributors, energy suppliers or other stakeholders. This aspect is also a marketing opportunity for those who supply the free service for increasing the number of its own customers, for promoting specific discounts or green communication/marketing actions;
6) discount for e-scooters users to use in specific shops or markets;
7) discount using Fidelity Card systems.

4.2. PRIVATE OWNERS OF E-LIGHT VEHICLES

There are no private owners of e-light vehicles in Suceava, only 3% of the population has a regular motorcycle. In order to promote e-vechicles, the following incentives could be analyzed:

a. **DIRECT INCENTIVES** - that have a direct monetary value to consumers, reducing payments electric vehicle owners would otherwise have been required to make.
b. **INDIRECT INCENTIVES -** are those that do not have a direct monetary value to the consumer. Rather, these incentives save time and provide convenience, which are sometimes much valued by consumers. Indirect incentives include access in the city center, access in restricted areas and public charger availability.

4.3. BUSINESS OWNERS OF E-LIGHT VEHICLES

There are no business owners of e-light vehicles in Suceava, only 3% of the population has a regular motorcycle. In order to promote e-vechicles, the following incentives could be analyzed:

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a) **DIRECT INCENTIVES** - that have a direct monetary value to consumers, reducing payments electric vehicle owners would otherwise have been required to make.
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Suceava municipality has started a project financed through URBACT III - *Freight TAILS: Tailored Approaches Implementing Lasting Solutions.*

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ignificant activity has gone into encouraging sustainable transport opportunities (walking, cycling, public transport) alongside measures to restrain private car use. However, freight and logistics have been generally only been dealt with in a fragmented way even though they are a significant component of overall traffic movements. This project will establish whether different approaches to the on-going problem of delivery and servicing activity in urban areas, are required for different areas within cities, to achieve on-going real improvements in greenhouse gas emissions and therefore air quality and traffic management. Action plans will be established to develop sustainable urban logistics approaches (micro/consolidation, SME co-ordination, retiming deliveries, efficient road space allocation), in specific urban areas (areas of high multi-tenanted office blocks, high street retail areas, areas dominated by single user (university campus or public sector administration), historic central areas). Business cases for different approaches, data on green house gas emissions and traffic improvements, and recommendations for implementation will be key elements of the Action Plan.

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5. POSSIBLE BUSINESS MODELS FOR THE IMPLEMENTATION OF ELECTRA

Taking into consideration the following constraints:

1. Weather;
2. Relief;
3. Roads;

And the user needs, the Suceava Municipality will implement during the period 2015 – 2017 the project **ELECTRO-MOBILITY – ELECTRIC VEHICLES FOR A „GREEN" MUNICIPALITY.**

The project aims to implement a pilot electro-mobility system in Suceava Municipality, including:

- EV charging infrastructure, namely 28 charging points, out of which:
  - 14 standard charging points;
  - 14 fast charging points;
- 15 electric vehicles procured in view of equipping the vehicle fleet of Suceava Municipality, out of which:
  - 11 electric cars;
  - 2 electric vans;
  - 1 utility vehicle - electric sweeper;
  - 1 utility vehicle - electric tanker;
- 56 specially-arranged parking spaces intended for electric vehicles, which will be placed next to the charging points;
- Infrastructure for charging and renting electric bikes (e-docking). The electric bikes charging infrastructure will be supplied by photovoltaic panels;
- 10 electric bikes which can be rented by inhabitants of Suceava Municipality and also by tourists in the area.

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6. ECONOMIC AND FINANCIAL ASPECTS OF THE MODEL

Energy and CO_2 savings potential of the above model:

We evaluated the followings:

- the annual impact of the 15 new municipal electric vehicles fully exploited instead of the actual municipal ones;
- the 5 kW photovoltaic panels.

The calculation has been done considering the average use of 33.000km/y for each vehicle and taking into account that no motorbike consumptions actually available to be replaced by e-bikes.

Secondly, the calculation improves by taking into consideration the vehicles' life duration (10 years) and the PV system (20 years) were considered.

Thirdly, it was shown that the charging network could support the Electric Vehicles development in the private sector: according to the EU statistics considering the number of charging points provided in the project, a number of approximately 200 private electric vehicles could be supplied by 2020. In order to calculate the impact by 2020, we considered an average value of 100 EV for a period of 4 years.

Lastly, it is considered that the charging points could be supplied with green electric energy (for instance, by means of PV generated electricity or provided by the biomass cogeneration installation).

The alternative selected is the most cost-efficient one to approach the identified problem. Other alternatives have been considered and the proposal is the most appropriate in terms of cost-efficiency.

The calculation has been carried out with the same methodologies and factors used in the Sustainable Energy Action Plan: IPCC factors, fuels heating values and national electricity emission factor taken from the SEAP guidelines for CoM municipalities written by the Ispra Joint Research Centre.

As reported in the baseline referred to 2005 the electricity supply at local level is pro-vided by the coal power plant which is also the heating source of the district heating system: even if the local emission factor for electricity is higher, the municipality de-cided to use for the calculation the national value of 0.701 tCO_2/MWh (as reported in the JRC guidelines for SEAP&BEI development) because the energy consumption and distribution depends on the national network and not only on the local powerplant.

Romania	0,701

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National IPCC emission factor taken form Table n.5 "Seap guidelines"

TABLE 4. STANDARD CO_2 EMISSION FACTORS (FROM IPCC, 2006) AND CO_2-EQUIVALENT LCA EMISSION FACTORS (FROM ELCD) FOR MOST COMMON FUEL TYPES		
TYPE	STANDARD EMISSION FACTOR [t CO_2/MWh]	LCA EMISSION FACTOR [t CO_2-eq/MWh]
Motor Gasoline	0.249	0.299
Gas oil, diesel	0.267	0.305

"Seap Guidelines" table n.4

TABLE 7. CONVERSION FACTORS FOR THE MOST TYPICAL TRANSPORTATION FUELS (EMEP/EEA 2009; IPCC, 2006)	
FUEL	CONVERSION FACTOR (KWH/L)
Gasoline	9.2
Diesel	10.0

"Seap Guidelines" table n.7

The calculation results are summarised in the table below including a financial assessment of the cost/benefits considering a total cost for the project of 3.112.489,61 CHF.

Electric vehicle	Energy saved MWh	RES MWh	tCO_2	CHF/kWh	CHF/tCO_2
Yearly	282	5,5	12	10,84	259.374
Project lifetime	2.817	110,0	159	1,06	19.631
Municipality + privat at 2020	10.107	110,0	1.350	0,30	2.306
Municicpality + privat at 2020 + "green" electricity	13.851	110,0	3.777	0,22	824

The impact has been calculated on yearly basis and for the whole lifetime of the plants installed.

6.1. SCOOTER SHARING SYSTEM

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The population is not ready yet for implementing a sharing system. For this reasons, the Suceava Municipality will intensify the communication activities.

The lack of information, or worse misinformation, regarding EVs is a major barrier that needs to be tackled. Raising awareness of electric mobility is an important function for cities to increase the number of electric vehicles, driven by consumers and in commercial fleets.

To strengthen the exchanging of information, the dissemination and the relevant stakeholders' involvement through specific actions, the Ele.C.Tra model includes:

- regional clusters stakeholders, like local and regional authorities, regional chambers of commerce, in order to emphasize the advantages of electrical scooter sharing, to mobilize beneficiaries from all parts involved in electrical scooters' industry and to bring down to local and regional level European practices on alternative fuel and transportation adopted by other cities;
- School and university involvement, to focus on young students (at least 16 years old), in accordance with the user target that use scooters very much. How can the Ele.C.Tra model involve them?
    - By specific dissemination campaigns to be held in schools, with particular attention to technological device use (website, the Ele.C.Tra. app, social network, etc, developed by the WP7 tasks);
    - By specific events with teachers and pupils;
    - Raising awareness in families, focusing on safety (topics already noted by interviewees);
- other dissemination campaigns, focusing on specific user target and/or local needs.

6.2. PRIVATE OWNERS OF E-LIGHT VEHICLES

Private owners will be invited to test the EV cars that will be owned by municipality and to test the e-bike system that will be implemented in the future.

6.3. BUSINESS OWNERS OF E-LIGHT VEHICLES

For the private owner, the municipality of Suceava will implement a project: financed through URBACT III - *Freight TAILS: Tailored Approaches Implementing Lasting Solutions.*

Significant activity has gone into encouraging sustainable transport opportunities (walking, cycling, public transport) alongside measures to restrain private car use. However, freight and logistics have been generally only been dealt with in a fragmented way even though they are a significant component of overall traffic movements. This project will establish whether different approaches to the on-going problem of delivery and servicing activity in urban areas, are required for different

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areas within cities, to achieve on-going real improvements in greenhouse gas emissions and therefore air quality and traffic management. Action plans will be established to develop sustainable urban logistics approaches (micro/consolidation, SME co-ordination, retiming deliveries, efficient road space allocation), in specific urban areas (areas of high multi-tenanted office blocks, high street retail areas, areas dominated by single user (university campus or public sector administration), historic central areas). Business cases for different approaches, data on green house gas emissions and traffic improvements, and recommendations for implementation will be key elements of the Action Plan.

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7. THE APPROPRIATE TECHNOLOGY AND INFRASTRUCTURE

Technology and infrastructure will be in place after 2017.
The proposed locations for the 28 charging points that will make up a public infrastructure intended for charging **the electric vehicles and electric utility vehicles** are the following:

Object 1 – Standard charging points

- The proposed locations for the **standard charging points** (SCP) are:

No.	Location SCP (landmark)	Location	Property doc according to GD 1354	SCP (piece)
1	Back Parking Municipality Suceava	Alexandru cel Bun Street	pos 6	2
2	Garage Municipality Suceava	Land adjacent to the administrative headquarter of Suceava Mayoralty	Inv. no. 1553	2
3	Front Parking Municipality Suceava	Land adjacent to the administrative headquarter of Suceava Mayoralty	Inv. no. 1553	2
4	General Department of Public Domain headquarter	Land adjacent to the Headquarter of the General Department for Public Domain	Inv. no. 1522	1
5	Centre underground parching P1	The Park in 22 Decembrie Square	Inv. no. 347	1
6	Parking area Obcini ANL blocks-Metro	Pictor Serban Rusu Arbore Street, Tatarasi lot	Inv. no. 282	1
7	Parking area Obcini ANL blocks Burdujeni	Privighetorii Street	Inv. no. 168	1
8	Parking area BCR - headquarters	Ştefan cel Mare Street	Inv. no. 555	1
9	The public area Iţcani Railway Station	Station Street	Inv. no. . 79	1
10	Samoil Isopescu Street Parking	Parking lot in Samoil Isopescu Street	Inv. no. 561	1
11	Zamca Monastery public parking area	Parking lot in Zamca Street	Inv. no. 520	1
	Total SCPs – standard charging points			**14**

Object 2 – Fast charging points

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- The proposed locations for the **fast charging points** (FCP) are:

No.	Location FCP (landmark)	Location	Property doc according to GD 1354	FCP (pieces)
1	Department of Social Assistance Burdujeni	22 Decembrie Street	Inv. no.226	1
2	The public area Burdujeni Railway Station	Nicolae Iorga Street	Inv. no 150	1
3	Parching area Bazar	Calea Unirii parking lot	Inv. no 588	1
4	Central square - Markets Management Department	Petru Rareş Street	Inv. no. 159	1
5	Bucovina store parking	Parking lot in Ştefan cel Mare Street	Inv. no. 542	1
6	Centre underground parching P2	Prefecture Park	Inv. no. 342	2
7	Traditions Centre area	Universităţii Street	Inv. no. 211	1
8	Crossroads Mărăşeşti parking	Parking lot in Mărăşeşti Street	Inv. no. 522	1
9	Front Parking Municipality Suceava	Land adjacent to the administrative headquarter of Suceava Mayoralty	Inv. no. . 1553	2
10	General Department of Public Domain headquarter	Land adjacent to the Headquarter of the General Public Domain Department	Inv. no. . 1522	1
11	Obcini district - intersection of Marshal Ion Antonescu street and December 1 Boulevard	1 Decembrie 1918 Avenue	Inv. no. . 225	1
12	Obcini district - Territorial Labor Inspectorate	Bistriţei Street	Inv. no. . 29	1
	Total FCPs – fast charging point			**14**

Object 3 – Electric bikes charging system

- The proposed location for the electric bikes:

No.	Location BCS (landmark)	Location	Property doc according to GD 1354	pieces

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7	Traditions Centre area	Universităţii Street	Inv. no. 211	1

The Dispatcher controlling and collecting the fee for charging the electric vehicles proposed to be procured under the project, but also other cars which can use the municipal charging network, will be placed in the Mayoralty headquarter, situated in 5A, 1 Mai Avenue, postal code 720224, Suceava Municipality.

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8. THE IMPACT OF THE SUGGESTED SCENARIOS ON THE ENVIRONMENT

The implementation of the pilot electro-mobility system will contribute to:

- **Reduced CO_2 emissions into the atmosphere** and reduced conventional fuel consumption, by procuring 15 zero-emission electric vehicles and replacing the current ones in the polluting and obsolete vehicle fleet of the Mayoralty
- **Supporting the use of green (electric) transport modes** in Suceava Municipality and increased trust of citizens in the reliability of the new EV technology:
  - **the electric transport is clean, silent and safe,** contributing thus to improving the quality of life for citizens in Suceava Municipality;
  - Electric vehicles meet the urban daily travel needs, which do not normally exceed 100 km/day;
  - Electric vehicles reach maximum speeds similar to classic vehicles, but they accelerate faster and very smoothly;
  - Ensuring easy access to using the EV charging infrastructure;
  - The charging equipment is safe, easy to install and easy to use;
  - **Low maintenance costs** due to construction simplicity, compared to classical vehicles;
  - **The operating costs are much lower than for conventional vehicles**.
- **Stimulating the use of electric vehicles,** by:
  - Setting up an infrastructure including 28 charging points in public places, out of which 14 standard charging points and 14 fast charging points;
  - Implementing a bike charging and renting system (e-docking) for 10 electric bikes;
  - Energy autonomy by implementing renewable energy sources to feed the electric bike charging system - 1 photovoltaic charging system for bikes;
  - Setting up 56 parking spaces for electric vehicles.
- **Changing the mentality** of current and future vehicle owners, in view of partial and gradual replacement of conventional vehicles by EV (electric vehicles) and alternative transport modes (electric bikes);
- **Providing a model of good practice** for other local, regional and national public institutions – no other municipality in Romania had adopted the EV technology;
- **Promoting a modern, sustainable, less polluting, energy efficient and cost-efficient transport**;

Moreover, the project will contribute to meeting the following development directions set forth at European level and which Romania will align to:

- **Sustainable development**: both by setting up a silent and clean pilot electro-mobility system and by paying attention to the needs of citizens, in the context of integrated development of the municipality;
- **Energy efficiency**: by reducing the fuel consumption as a result of procuring 15 electric vehicles for the vehicle fleet of Suceava Municipality and by setting up of a photovoltaic panels system to supply the electric bikes charging and renting system;

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- **Environment protection**: by reducing CO_2 emissions and the level of ambient noise in Suceava Municipality.

Impact Indicators for the realization of the objective of the project are:

- Reduced CO_2 emissions in Suceava Municipality by at least 12 tCO_2/an;
- Reduced fuel consumption in Suceava Municipality by at least 25.000 l by 2020.

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9. PLANNED ACTIVITIES FOR THE INTRODUCTION OF E-LIGHT VEHICLE SHARING SYSTEM

Activities planned by the municipality of Suceava and set out in the *Local action plan for the promotion and implementation of the electric vehicles and the charging infrastructure in Suceava* are:

1. Promote the use of EVs by creating a charging infrastructure through the installation of charging points in public and private parking spaces
2. Adopt electric transport as part of the local public transport in 85% of the total capacity and measures to encourage the use of electrical means in public transport
3. Promote the use of EVs in public institutions by buying EVs within a demonstration pilot project developed by Suceava Municipality
4. Introduce electric transport in urban taxi service at 15% of the authorized transport means
5. Promote legislative action favourable for purchasing and using EV meant to stimulate electric transport among private transport companies
6. Ensure the existence of renewable energy sources in the public EV charging system and the presence of a balance between the electricity consumed by EVs and the renewable energy produced
7. Public information of citizens for environmental education purposes and use of EVs and alternative transport means (ex. roller skates, electric bicycles)
8. Prepare a concrete plan to create a specific operating system for EVs

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