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EnerNETMob

Mediterranean Interregional Electromobility Networks for intermodal and interurban low carbon transport systems

Work Package	WP 3 - Studying
Activity	3.4 – Structural Knowledge Framework
Deliverable	3.4.1 – Local Framework Analysis on Electro-Mobility and Energy Supply State of Art
Partner Responsible	CAPENERGIES
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Deliverable 3.4.1

Local Framework Comparative Analysis of all 13 reports

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1. Introduction

1.1 EnerNETMob in a nutshell

Main expected result of EnerNETMob project is the creation of a pilot *"Mediterranean Interregional Electromobility Network"*, constituted by pilot regional *"Small-Scale Infrastructure Networks"* connecting cities, rural areas and intermodal terminals at transnational as well as at interurban level.

As reported in the Application Form, the *"Small-Scale Infrastructure Network"* consists of pilot modular systems of *"Electric Vehicle Supply Equipment"* (EVSE), which are connected to the public electric grid and in some cases are also co-powered by RES.

An amount of 13 local ***"EVSE Networks"***, as single modules of the overall *"Mediterranean Interregional Electromobility Network"*, are placed in different nodes of the partner regions in order to allow longer interurban/interregional displacements by Battery Electric Vehicles (BEVs).

Each *"EVSE network"* will be managed independently by its owner Authority, and at meantime it will be interfaced and interconnected with other infrastructures of *"Mediterranean Interregional Electromobility Network"*, according to the Directive 2014/94/UE.

Therefore, for each local *"EVSE Networks"*, during the Module 1 every appointed partner will draft:

- a *Structural Knowledge Framework*, with the analysis of the local context;
- a *Sustainable Electro-Mobility Plan*, with preliminary design of the EVSE infrastructures /services.

Thus, during the Module 2 EnerNETMob partners will test abovementioned networks with **3 pilot actions**:

- *Pilot 1 - Intermodal Sea-Road Electromobility Networks*, linking islands and coastal regions;
- *Pilot 2 - Sharing Electromobility Services*, such as e-car pooling, e-car sharing, e-bike sharing;
- *Pilot 3 - City Logistic Electromobility Services*, for the last mile freight transport connections in urban and rural areas.

To develop and test such local *"EVSE Networks"* during pilot actions, the partners will develop some **small-scale investments** in all participating regions, by including the following **main outcomes**:

- "Battery Electric Vehicles" (BEV) to be used by all the partners for the testing phase of pilot actions;
- "E-Bikes" to be used by some involved partners for the testing phase of pilot actions;
- "Charging points" to be installed in all participating regions in order to provide energy to BEVs;
- "Photovoltaic charging points" to be installed in all participating regions in order to provide electric energy to BEVs, also through Renewable Energy Sources (RES);
- ICT tools for remote control of charging services using same common communication protocols.

Given the above, the documents of ***Deliverable 3.4.1 – Local Framework Analysis on Electro-Mobility and Energy Supply State of Art*** will be drafted in order to be used by all involved partners to develop Action plans of "Sustainable Electro-Mobility Plans" and their pilot activities.

The Local Framework analysis therefore will define:

- The current state of the art of transport supply and demand in all the involved Countries/Regions, focusing on interurban displacements and on electro-mobility integration with intermodal terminals
- Where possible, the current state of the art of energy supply and demand analysis of local grids, focusing on RES supply systems in coherence with the local/regional and national authorities

1.2 General report on Local Framework Analysis on Electro-mobility and Energy Supply State of Art

The aim of Structural Knowledge activity in the project, is to perform Local Framework Analysis on Electro-mobility and Energy Supply State of Art according to regulation analysis and common planning guidelines, in order to define efficient transport/regional planning of local "Small-Scale Infrastructure Network" for electromobility which will be implemented in the involved partner territories but that can also be adopted by other regions.

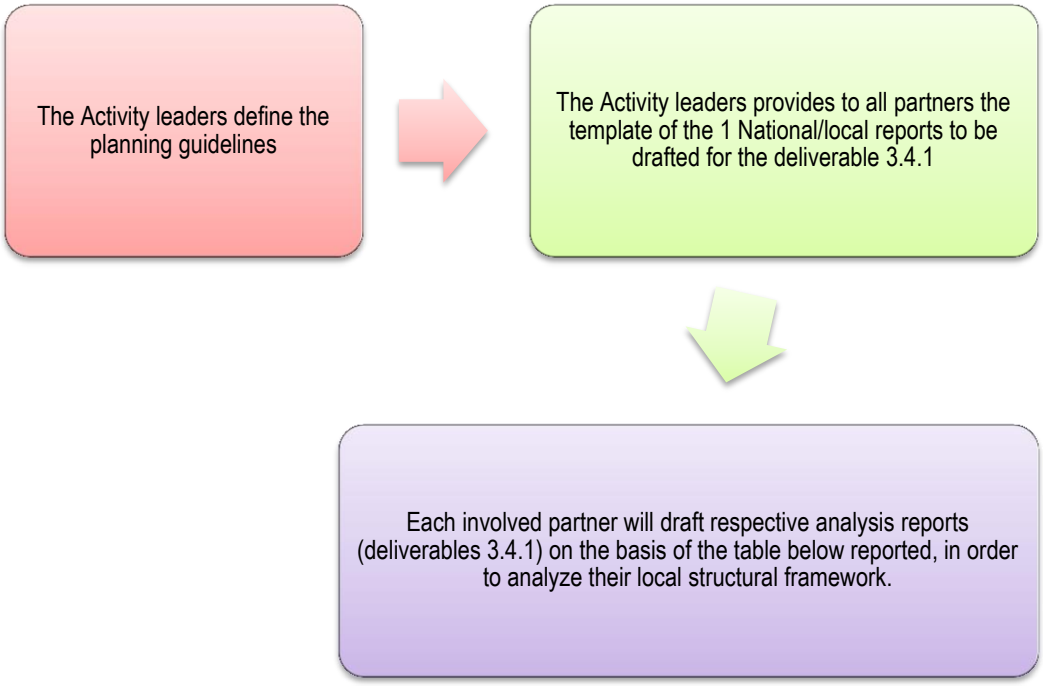
Analyzing data, assets, opportunities and challenges facing European territories will lead to a land use scheme and action plan for electromobility deployment that is more efficient and responsive to the public because it has been built focusing on the region's unique character and in line with the current SEAPS and SUMPs adopted by local authorities.

The objectives of Local Framework Analysis are to:

- Locate and size the current electromobility infrastructures (as charging infrastructures) and both their territorial distribution and demand;
- Put forward strategic starting points and proposals for the implementation of electromobility demonstrator in the involved partner territories linked with the current state of the art of the sector.

1.3 Distribution of tasks

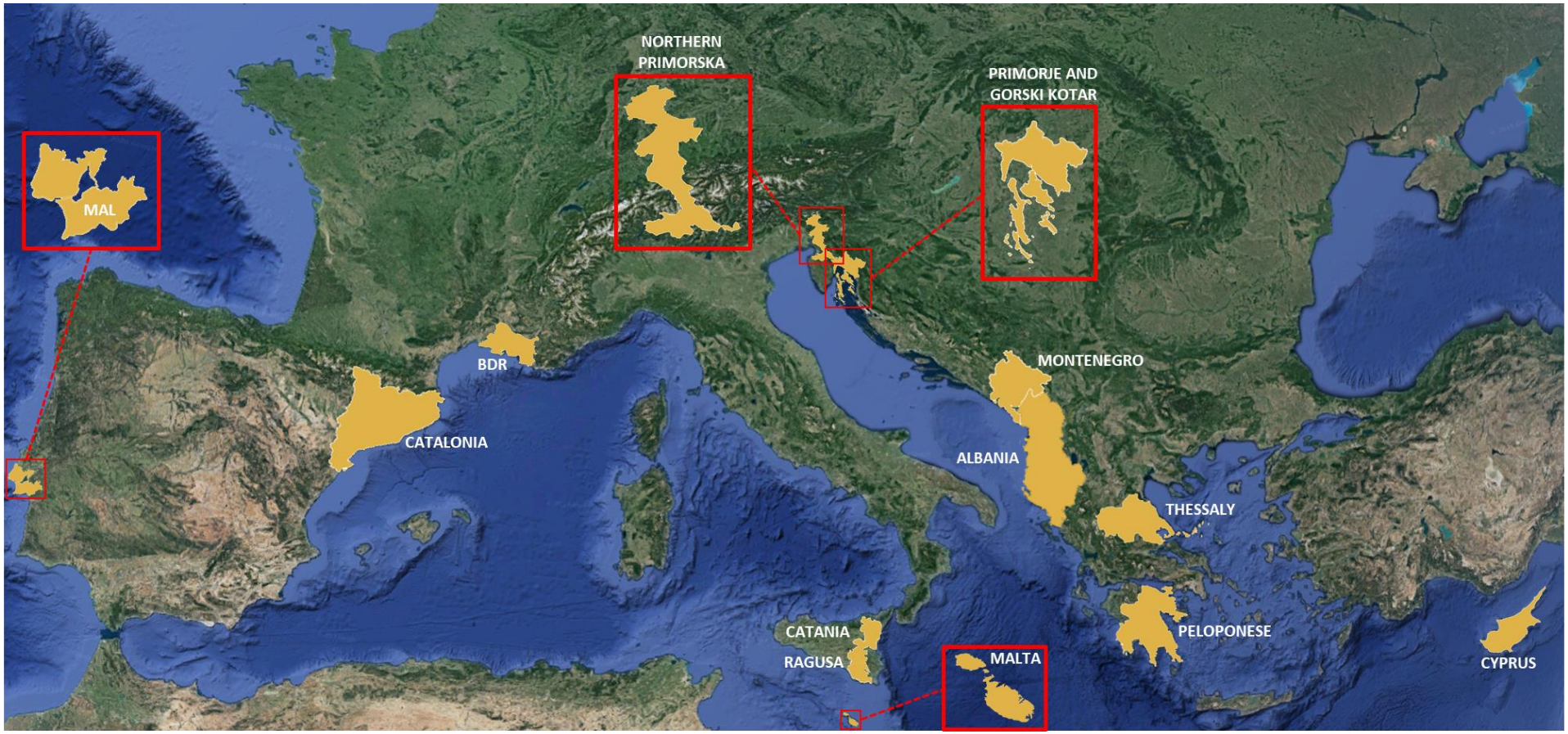
The Activity 3.4 will be developed according to the following flow chart:



Distribution of tasks for Deliverable 3.4.1 - *Local Framework Analysis on Electro-Mobility and Energy Supply State of Art*

No. partner	Partner	Member State	Title of report	Territorial level	Involvement in the activity
LP	Region of Peloponnese	Greece	Local Framework analysis on Electro-mobility and Energy Supply state of art in Region of Peloponnese	Regional	Involved
PP1	Transport Malta	Malta	Local Framework analysis on Electro-mobility and Energy Supply state of art in Malta	National	Involved
PP2	RAM logistica infrastrutture e trasporti Spa	Italy	-	-	**Not Involved**
PP3	Ministry of Transport Communication and works	Cyprus	Local Framework analysis on Electro-mobility and Energy Supply state of art in Cyprus	National	Involved
PP4	Albanian Institute of Transport	Albania	Local Framework analysis on Electro-mobility and Energy Supply state of art in Albania	National	Involved
PP5	Region of Thessaly	Greece	Local Framework analysis on Electro-mobility and Energy Supply state of art in the Region of Thessaly	Regional	Involved
PP6	County of Primorje and Gorski Kotar	Croatia	Local Framework analysis on Electro-mobility and Energy Supply state of art in the County of Primorje and Gorski Kotar	Regional	Involved
PP7	Northern Primorska RDA	Slovenia	Local Framework analysis on Electro-mobility and Energy Supply state of art in Region of Northern Primorska	Regional	Involved
PP8	University of Palermo -Department of Agricultural Food and Forest Sciences	Italy	Local Framework analysis on Electro-mobility and Energy Supply state of art in the Città Metropolitana di Catania	Local	Involved
PP9	Energy and environment Agency of Arràbida	Portugal	Local Framework analysis on Electro-mobility and Energy Supply state of art in the metropolitan area of Lisbon	Local	Involved
PP10	Free Municipal Consortium of Ragusa	Italy	Local Framework analysis on Electro-mobility and Energy Supply state of art in Province of Ragusa	Local	Involved
PP11	Dynamic vision	Greece	-	-	**Not Involved**
PP12	Port of Bar Holding Company	Montenegro	Local Framework analysis on Electro-mobility and Energy Supply state of art in Montenegro	National	Involved
PP13	International Center of Numerical Methods in Engineering	Spain	Local Framework analysis on Electro-mobility and Energy Supply state of art in Region of Catalonia	Regional	Involved
PP14	Capenergies	France	Local Framework analysis on Electro-mobility and Energy Supply state of art in Bouches-du-Rhône	Local	Involved
PP15	Austrian Mobility Research FGM – AMOR	Austria	-	-	**Not Involved**

Map of territories involved in the study



BDR : Bouches-du-Rhône
MAL : Metropolitan Area of Lisbon

1.4 Structure of the partners' report

Each partners' *Local Framework Analysis on Electro-mobility and Energy Supply State of Art* has been drafted on the basis of the suggested minimum contents and technical standards reported in the guidelines defined by the consortium, and pursuant the *Directive 2014/94/EU of the European Parliament and of the Council on the Deployment of Alternative Fuels Infrastructures* (DAFI).

With this purpose, the "Partner report" has been structured in the following suggested chapters:

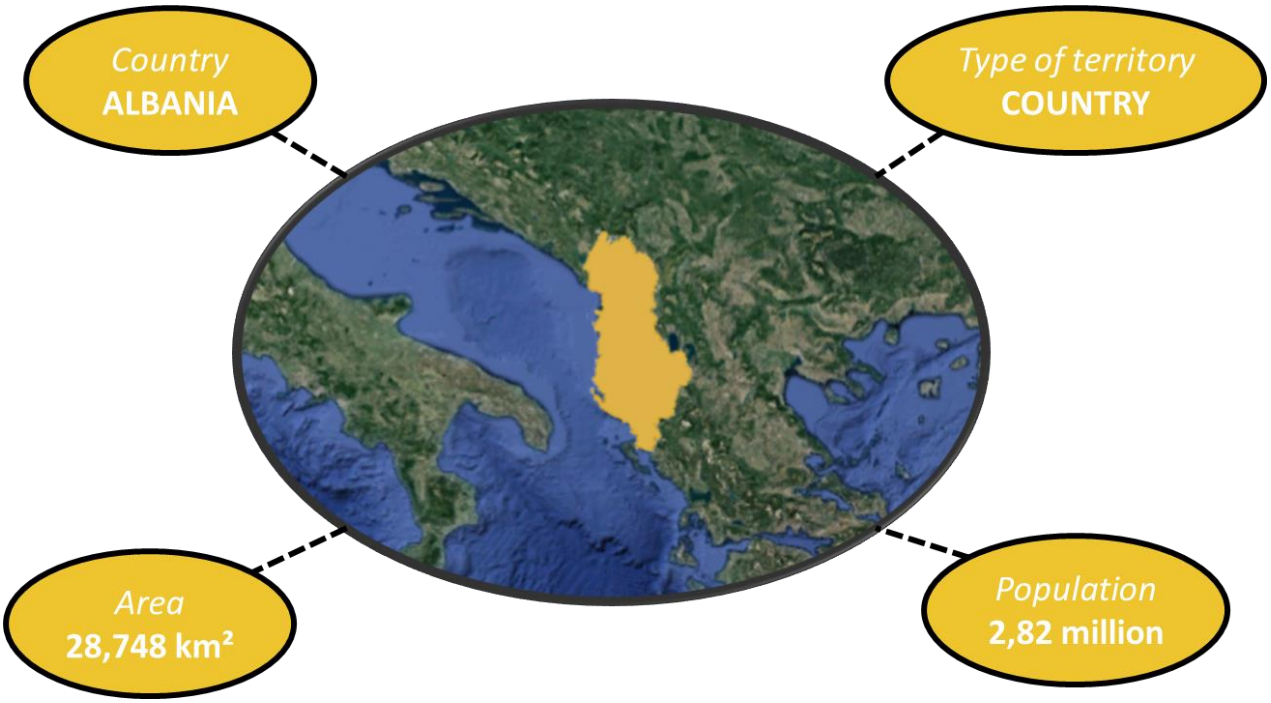
Introduction

1. Land use analysis of local system and their connections
2. Socio-Economic Framework
3. Transport Framework
   - 3.1 Transport Supply (including electromobility focus)
   - 3.2 Transport Demand (including electromobility focus)
4. Energy Framework
5. Analysis of ongoing plans
   - 5.1 Land use and regional plans
   - 5.2 Mobility plans
   - 5.3 Energy and environmental plans
6. SWOT analysis
7. Conclusions

Based on these reports, the present document aims at gathering and comparing Local Framework Analysis on Electro-mobility and Energy Supply State of Art reports written by all partners and extract relevant information to give an overall overview on the current and future situation of partners' region regarding the development of electromobility projects.

2 Focus on Local framework analysis on electro-mobility and energy supply state of art of involved Member Partners

2.1 Analysis of electro-mobility and energy supply in Albania



Having recently transitioned from a centrally planned to a market-oriented economy, Albania's development has been under way and has mostly favored the Tirana-Durres metropolis. This region contributes with more than one third to the country's GDP and benefits the most from the improvement of transport and public infrastructure.

Rural areas on the other hand experience in many cases depression in population and economic activity, and in other cases are attached to cities through continuous urban structures without character and premeditated functions. Agriculture though remains a significant sector of the economy of Albania. It employs 40% of the population, and about 24.31% of the land is dedicated to agricultural purposes.

As for transport, road represents the predominant mode of land transportation for passengers and freight in Albania. Roads have received the most of transport infrastructure investments. Maritime transport plays also a significant part of the overall economic sector and relies on four major ports authorities (Durres, Vlora, Shengjin and Saranda).

The Albanian Government has set in its top priorities to develop and modernize the transport infrastructure. It aims to accelerate the integration of Albania's transport system and the establishment of an integrated market comprised of transport infrastructure by land (road and rail), by sea and by inland

waterways. The goal is to maximize Albania's advantageous geographical position to develop the country and favor its European integration.

2.1.1 Mobility in the Tirana-Durres region

The central position of Tirana has made of the city a major transport hub in the whole country. Its rapid urbanization and the increase of households' motorization have resulted in causing congestion traffic and environmental pollution in the metropolitan area. Tirana counts about 200 cars per 1,000 inhabitants, which is only slightly less than the European average (300 cars / 1000 residents). Public transportation is for now very much underdeveloped and is only based on motorized vehicles (buses, taxis).

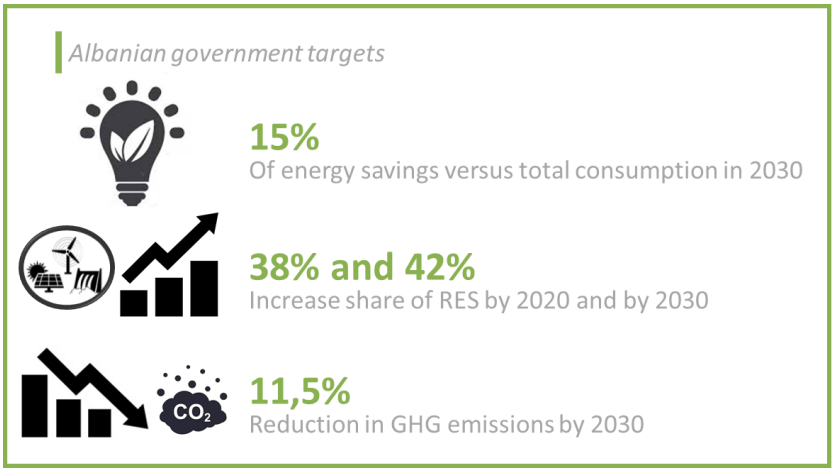
The main challenge Tirana region faces in the short-term is to build infrastructures. Motorization is expected to grow in the coming years and will need road improvements and new parking facilities. Yet given the ambition of the country to implement European standards for fuel quality and fuel economy, local authorities also plan to dedicate lanes to buses and taxis, introduce new bus lines, increase electric taxi companies, develop the use of bicycles and incentivize the renewal of motor vehicles.

2.1.2 Energy

The energy consumption has gradually increased since 2007 due to Albania's economic boost. This raise has been partly supported by the development of renewables: Albania produces 35% of the energy from renewable sources, mostly from hydropower stations, and aims to diversify resources, integrating biomass, solar energy and wind energy.

Like most European countries, the transport sector is responsible for more than 1/3 of final energy consumption. It is also the single largest producer of CO_2 emissions in Albania, with 2,468 Gg of CO_2 emissions in 2018 accounting for 52.5% of the country's emissions. The largest contributor to this is road transport, accounting for 97.72%. Developing electro-mobility appears to be a priority to connect the need of improving people's standards of living to fighting climate change.

In that respect, the Albanian government is set to:



2.1.3 Electric mobility

Electric mobility is today minor in Albania and represents less than 0.10% of vehicles currently registered according to the Institute of Transport. Tirana concentrates the most electric cars in the country, particularly among administration and taxi fleets. The deployment of charging infrastructures should accordingly focus on the capital in places like public transport stations, port passenger terminals or shopping malls.

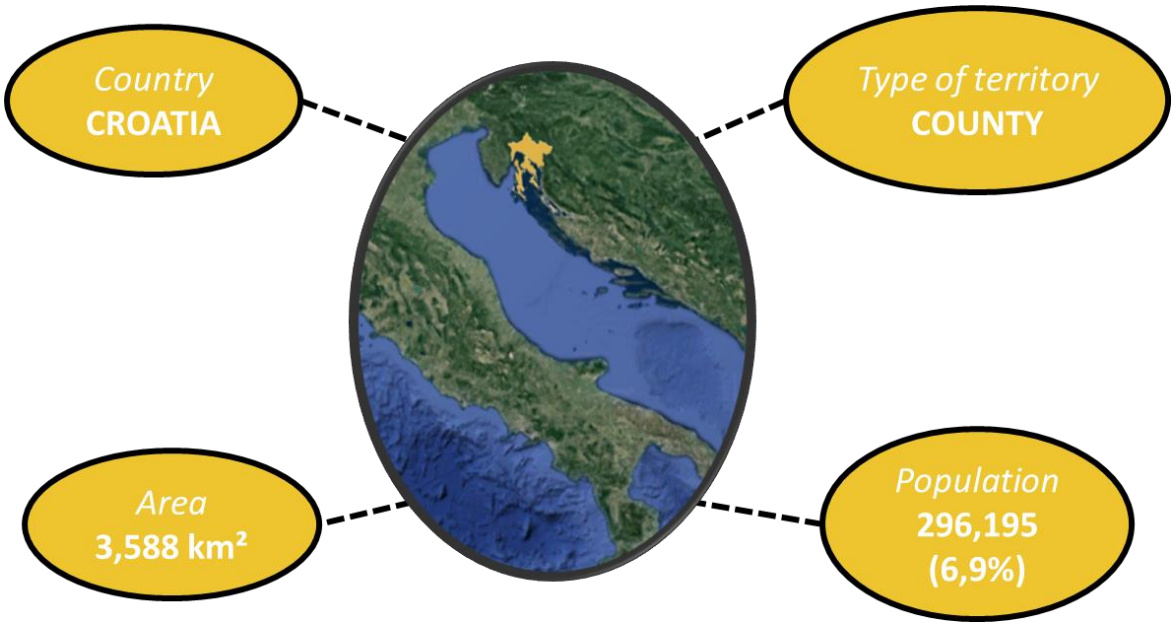
Though it may seem secondary compared to the need of improving transport infrastructures, the electrification of transport is a true opportunity to anticipate pollution and climate change issues and take advantage of Albania's high share of renewable energy.

Mobility figures for Albania

200
Cars per 1,000 inhabitants in Tirana

0,10%
Of the total amount of circulating vehicles in the country

2.2 Analysis of electro-mobility and energy supply in County of Primorje and Gorski Kotar (Croatia)



Located on a distinct coastline and on a strategic position in Central Europe, the County of Primorje and Gorski Kotar is the second most developed county in Croatia and accounts only for 7% of the total population of the country. A large part of the population operates in economic activities related to sea and traffic, and the County has developed seaports, maritime traffic, shipbuilding and tourism activities. The business, administrative, economic and cultural center of the County is the city of Rijeka, the third largest Croatian town with 128,624 inhabitants and port of particular economic interest to the country.

2.2.1 Mobility

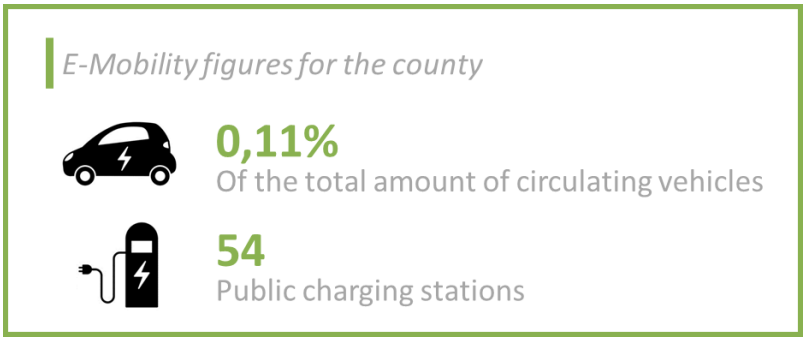
In order to strengthen its natural position of gateway to Central Europe, the County of Primorje and Gorski Kotar has developed sea, rail, road and air infrastructures, which connect the County to the rest of Croatia and the neighbouring countries. Freight traffic mostly depends on road, which leads to a necessary consistent improvement of the quality of roads, but yet environmental issues, such as pollution. The main challenge the County faces is therefore to make its transition to a sustainable transport hub. Developing electric mobility would be the first step towards that goal.

2.2.2 Energy

The favorable geostrategic position makes the County of Primorje-Gorski Kotar a significant energy hub, with numerous production facilities and a developed power grid, as well as the infrastructure necessary to power electric vehicles. In addition to the existing hydro power plants, which remain in operation with the possibility of reconstruction and upgrading, several locations for renewable energy sources, primarily wind

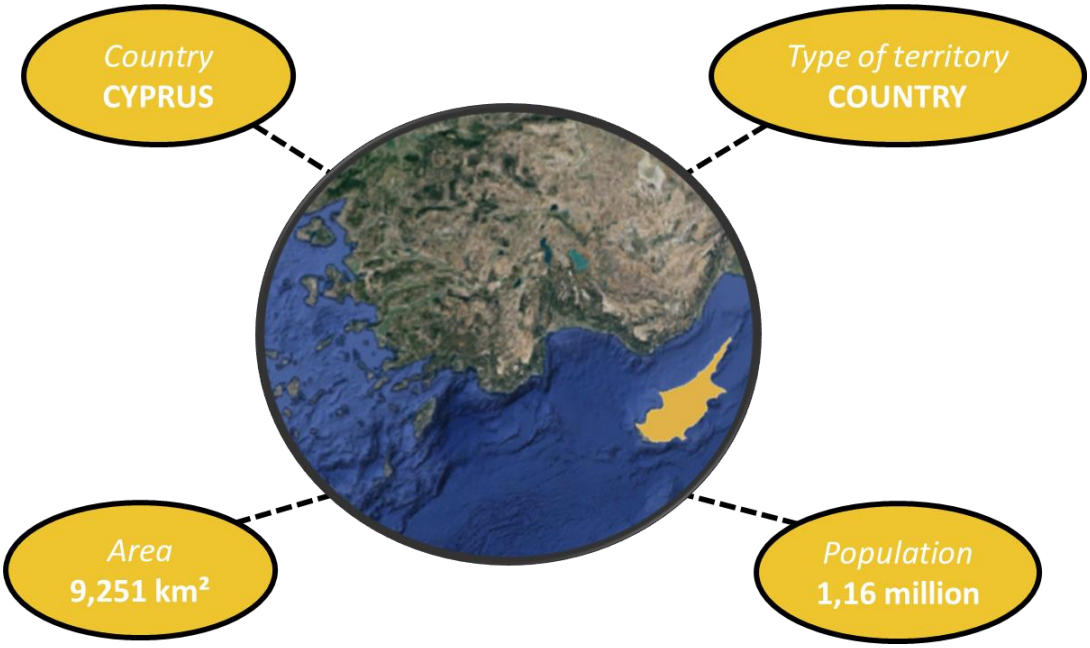
farms and photovoltaic systems, are planned.

2.2.3 Electric mobility



Electric mobility is a fast-growing sector in the County but still represents only 0.11% of the total amount of circulating vehicles. Two-wheelers and passenger cars are the categories of vehicles that count the most of registrations. Electric vehicles can today charge on 54 public charging stations mostly up to 22 kW. The development of electric utility vehicles appears to be the priority if the County wants to reach its ambition to reduce carbon emissions and energy consumption.

2.3 Analysis of electro-mobility and energy supply in Cyprus



Cyprus is an island state located in the Mediterranean Sea sharing maritime borders with countries from 3 continents. The country is divided into 6 main regions, each of which is home to one of the country's largest cities. In 2019, the population of the country was 1.16 million, of which more than 50% live in urban areas.

2.3.1 Mobility

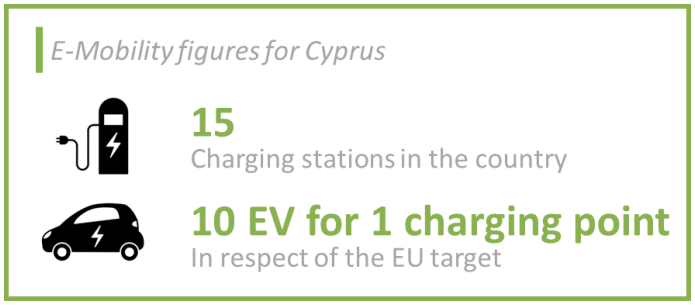
As an island with limited grid interconnections, Cyprus stands as highly dependent from energy imports. The transport sector is using mostly imported conventional fuels (gasoline, diesel). The rising costs for energy imports and EU regulations have encouraged the country to explore local gas resources and develop the production of renewables especially considering the island's climatic attributes (sun and wind). The renewable energy capacity of production represents 14% of the total installed power generation in Cyprus, with the highest share provided by wind (62% in 2019).

2.3.2 Energy

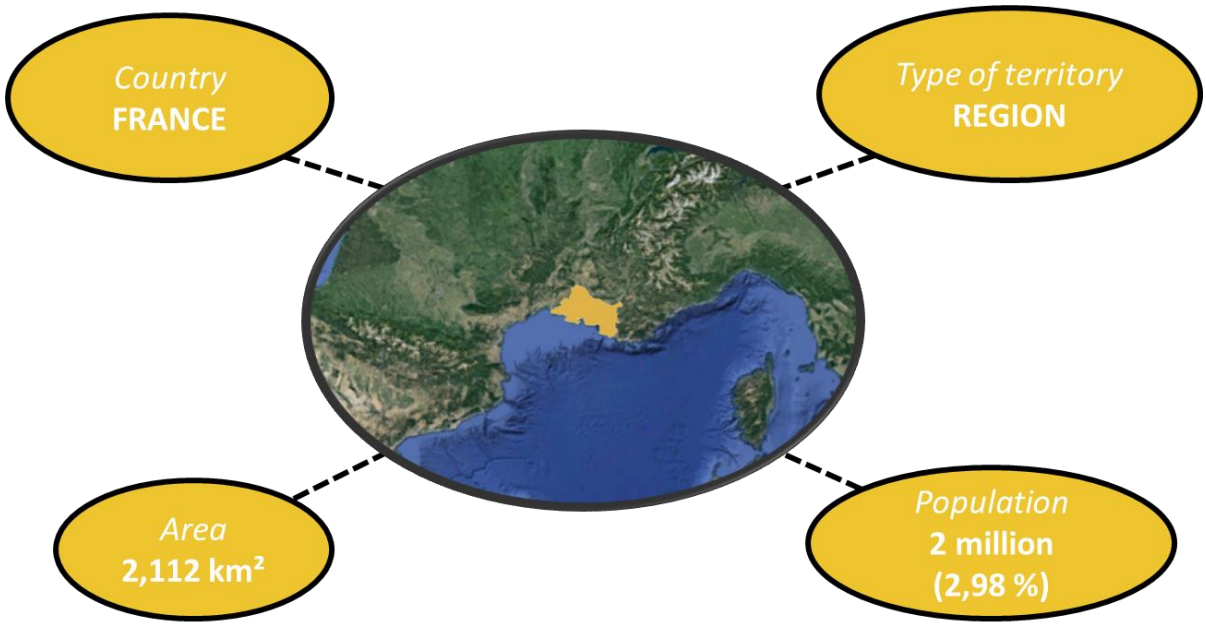
The overall target for the penetration of renewable energy is to reach 13% of Cyprus gross final energy consumption by 2020. According to the country's first National Renewable Energy Action Plan (NREAP), this objective should be met by reaching 16% of renewables in the energy sector, 23.5% for heating and cooling, and 4.9 % for transport (including all modes and fuels). If this goal were to be reached, the share of renewables in transport would have to be of 10% by 2020 thanks to renewable electricity and biofuels. Meeting this target seems out of reach in a short-term perspective, as electric mobility is currently very underdeveloped.

2.3.3 Electric mobility

Cyprus counts 20 charging stations. If the government has decided to deploy new charging infrastructures, incentives on the purchase and the use of electric cars have not been introduced yet. The share market of electric vehicles is therefore unlikely to grow in a short-term perspective.



2.4 Analysis of electro-mobility and energy supply in Bouches-du-Rhône (France)



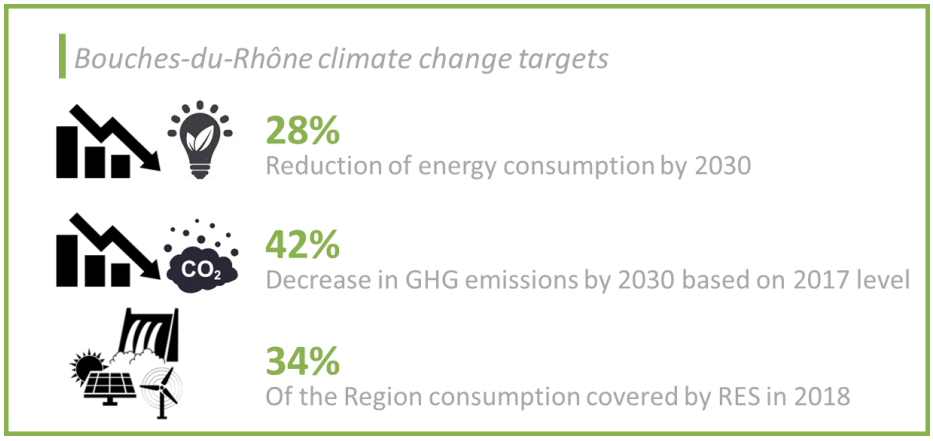
Bouches-du-Rhône covers 2,112 km² for more than 2 million people. 43% of the population live in Marseille, which shows the major economic role this city plays in the territory. Its activity generates mobility flows throughout the department that include any means of transportation: car, train and cargo. Fos-Marseille Port is indeed a hub for the transport of goods in the Région Sud and more generally in France. However important this sector can be, Bouches-du-Rhône is not just an industrial territory, it has also a rural identity. The agricultural activity covers one third of the territory indeed.

2.4.1 Mobility

Marseille and Aix-en-Provence are the main transport hubs of the territory and are accessible from road, train, sea and air transportation. Two motorways enable users to travel from each side of the territory.
The intense economic activity around those areas can generate important flows of vehicles and trucks on the territory, and create saturation. Still, despite a heavy traffic, personal car is the favorite means of travel and 78% of households have at least one vehicle.

2.4.2 Energy

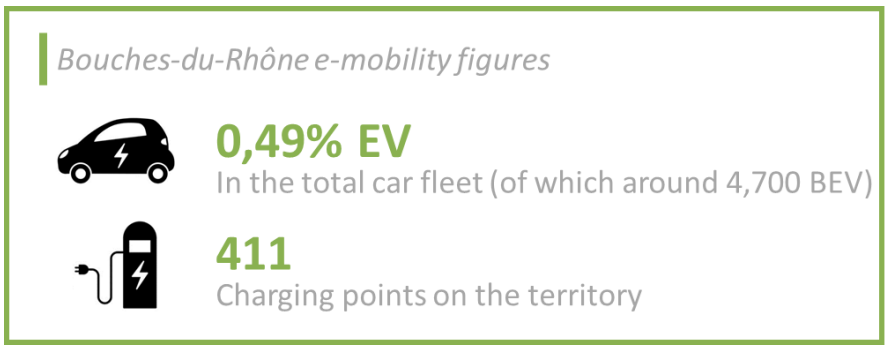
Bouches-du-Rhône aims by 2030 to reduce the energy consumption by 28% and greenhouse gas emissions by 42% based on 2017 level, which will affect road transport. Renewables are very developed in the whole Région Sud. It covered indeed in 2018 34% of the Region's consumption, mostly thanks to hydroelectricity.



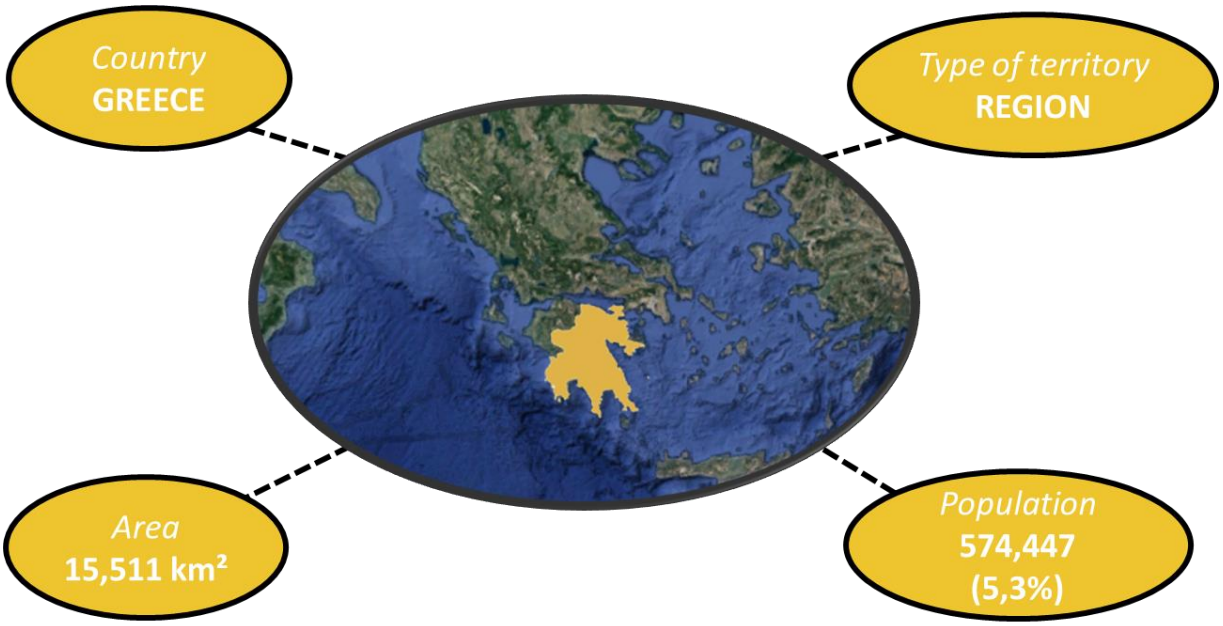
2.4.3 Electric mobility

France is a mature EV market, which massively supports the purchase of electric vehicles both on a national and local scale. Bouches-du-Rhône currently offers financial incentives that can be combined with the national bonus and scrapping scheme. Altogether those incentives can go up to 13,500 €, which should definitely encourage households to buy an electric vehicle. Electric vehicles represent today 0.49% of the total fleet of Bouches-du-Rhône (of which around 4,700 BEV).

In 2018, the territory hosted 411 charging point open to the public and the PACA region at the end of 2019 had nearly 2,000 recharging points. Both the Métropole de Marseille-Aix-en-Provence and Bouches-du-Rhône Departmental Council are currently deploying a network of public charging points in city centers and rural areas. These two EVSE networks shall eventually be complementary and meet the population needs. Another way to support electric mobility on a local scale would be to encourage farmers involved in short food supply chain to convert to electric cars. It would therefore represent an opportunity for the territory to promote actions in favor of greenhouse emissions reduction and renewable energy, as farms generally have a big enough roof to install a photovoltaic power plant.



2.5 Analysis of electro-mobility and energy supply in the Region of Peloponnese (Greece)



The Region of Peloponnese is located at the southern part of mainland Greece and represents 5.3% of the country's population: 574,447 inhabitants estimated in 2019 mostly concentrated in Corinth (26%) and Messinia (27.5%). Population is aging and despite a stronger resilience than other regions of the country and a decreasing unemployment rate, faces economic difficulties, as 27.93% is living under the poverty threshold.

The Region of Peloponnese has a strong manufacturing base developed mainly due to its proximity to Attiki. It also possesses a dynamic tourism and services sector with important growth potential, due to new public and private investments directed mainly to tourism. Agriculture, finally, represents another important pillar of the region's economy.

2.5.1 Mobility

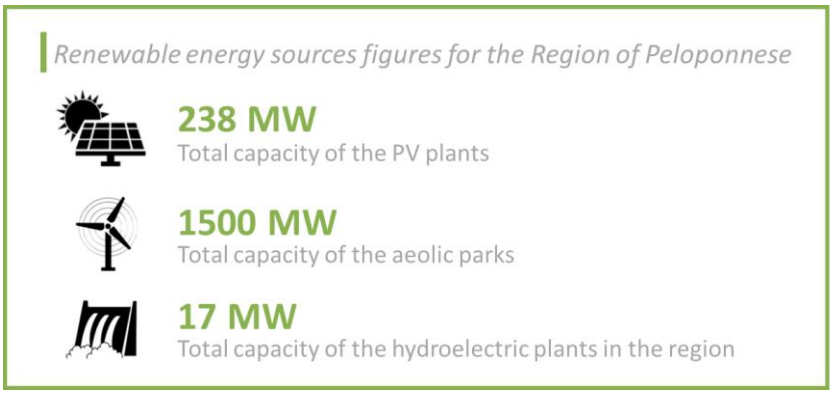
The Region of the Peloponnese is a vast territory connected to the Greek mainland by the Corinth isthmus and a bridge, which makes the connection to Northern Greece. The level of transport infrastructures seems to be sufficient to provide inhabitants with a safe and fast road network.

Inhabitants from Peloponnese resort a little bit less to cars than average Greeks. Most of the vehicle traffic in the Region of Peloponnese takes place in the urban areas of the largest cities (Tripoli, Argos, Corinthos, Sparti, and Kalamata) and in the interurban network, which connects these cities. Because they are mostly exposed to transport nuisances those cities have started the preparation of a Sustainable Urban Mobility Plan to phase a local strategy on how to limit pollution and improve quality of life for inhabitants.

2.5.2 Energy (see also 1.3.2)

The Greek energy sector is largely dependent on fossil fuels, most of which are imported. About 54% of its energy requirements are covered by petroleum products alone, compared to an average of 33.4% at the EU level. These petroleum products are not only used in the transport sector, but they are also converted in relevant amounts into electricity.

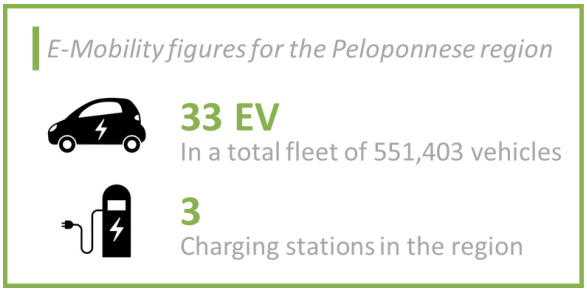
Greece has drafted a National Action Plan that aims to achieve the binding national target of 18% participation of renewables in gross final energy consumption by 2020 (in 2005, it accounted for almost 7%), derived from Directive 2009/28 EC and generally, harmonizes the Greek legislation with the European Directives. The country has also carried out several policies and measures, in order to reduce its energy consumption and carbon footprint. On a local scale, several municipalities of the region of Peloponnese have joined the EU Covenant of Mayors for Climate and Energy Initiative, a worldwide multi-stakeholder movement that provides cities technical and methodological support adopt an integrated approach to climate change and reduce energy consumption.



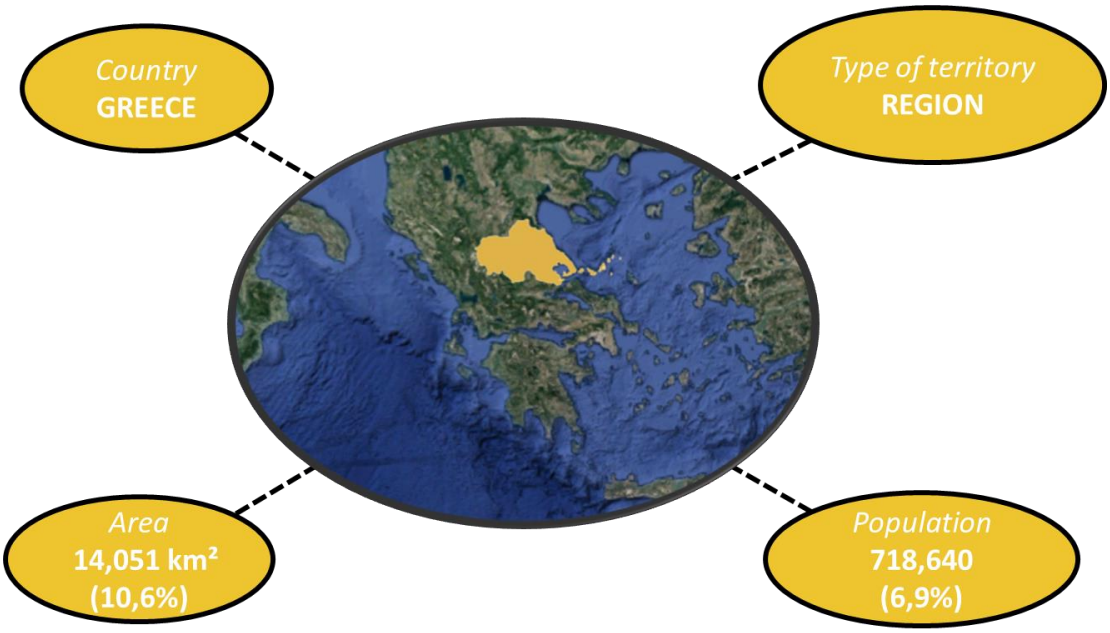
2.5.3 Electric mobility

Despite the enforcement of national incentives on the purchase of electric cars since 1992, electric mobility is limited in the Region of Peloponnese as well as the rest of Greece: 33 electric vehicles were registered in 2017, 80% of them being L-vehicles. The number of charging infrastructures is consequently low with a few private business initiatives. On a regional scale, public authorities have not implemented yet EV-friendly policies such as such as lower parking prices in public parking spaces, accommodation to access the center of big cities of the region, while forbidding the entrance to conventional cars…

Within the framework of EnerNETMob project, the Region of Peloponnese plans to install three quick chargers mostly directed to sharing mobility services and located in administration offices parking areas in Nafplio, Sparta and Megalopoli or Elafonisos. These stations will be added to the planned locations in Tripoli, Corinth and Kalamata financed by the EnerNETMob project to form a regional network.



2.6 Analysis of electro-mobility and energy supply in the Region of Thessaly (Greece)



The Region of Thessaly is located at the Central-Eastern part of mainland Greece at the crossroads of major European transportation routes towards to the East and inland regions. Though the population tends to decline, the Region of Thessaly is the third largest region in Greece by population. Four cities of the Region are composed of more than 100,000 inhabitants, among which the regional capital, Larissa. Yet the territory remains very much rural, as 40% of the population can be qualified of agrarian. Agriculture also accounts for 21% of the Region economy.

This double identity of the Region of Thessaly has led to intra-regional disparities, which could be solved by developing transport and improving connections between municipalities and with other regions.

2.6.1 Mobility

The number of cars registered in Greece drastically increased in the nineties and has stabilized for ten years. Cars are the most frequently used transportation and represent, for instance, in the Region of Thessaly, 72% of the percentage split of passenger per kilometer behind buses and light vehicles.

The main challenges the Region has to deal with are common with the rest of Greece:

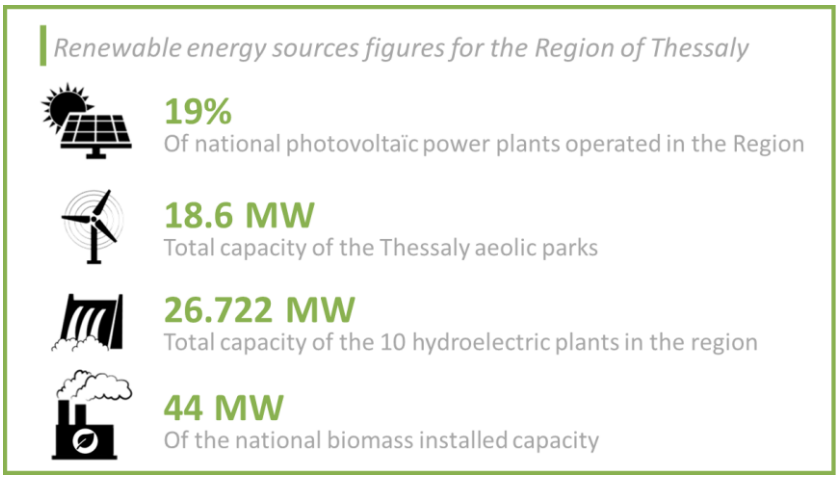
- Malfunctions of the transport system
- Overdevelopment of private space at expense of the public space
- Urban sprawl and “ex post” planning
- Reformation of cities and of their cultural centers that included upheavals of functionality and property
- High risk of degradation of areas as a result of increasing segregation and social exclusion

- Increasing pollution.

2.6.2 Energy (see also 1.6.2)

Between 2000 and 2009, the final energy consumption in transport increased by 26%, followed by a 32% reduction until 2013 because of the economic crisis and the reduction of petroleum products consumption it entailed. Compared to 2000, the overall energy efficiency of the transport sector improved by 40% in 2016. The measures that contributed to the significant energy savings that seem to be achieved in the transport sector are mainly related to the linking of the taxation of vehicles with CO_2 emissions. Despite of that, the transport sector consumes the biggest part of final energy consumption in Greece with 6.8 Mtoe in 2016.

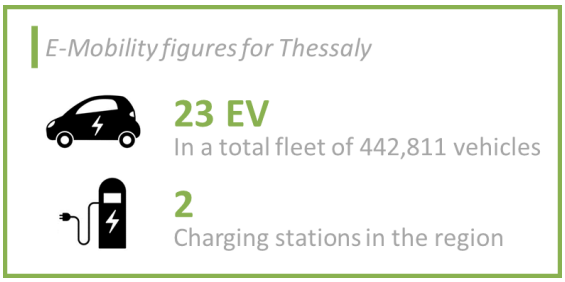
The renewable energy sector appears to be on the other hand limited as it only represented 8% of the country's final energy consumption in 2016. More specifically, the region of Thessaly hosts solar, wind, hydro and biomass production that will most likely keep increasing in the coming years as Greece has set the goal to develop renewable technologies through incentives.



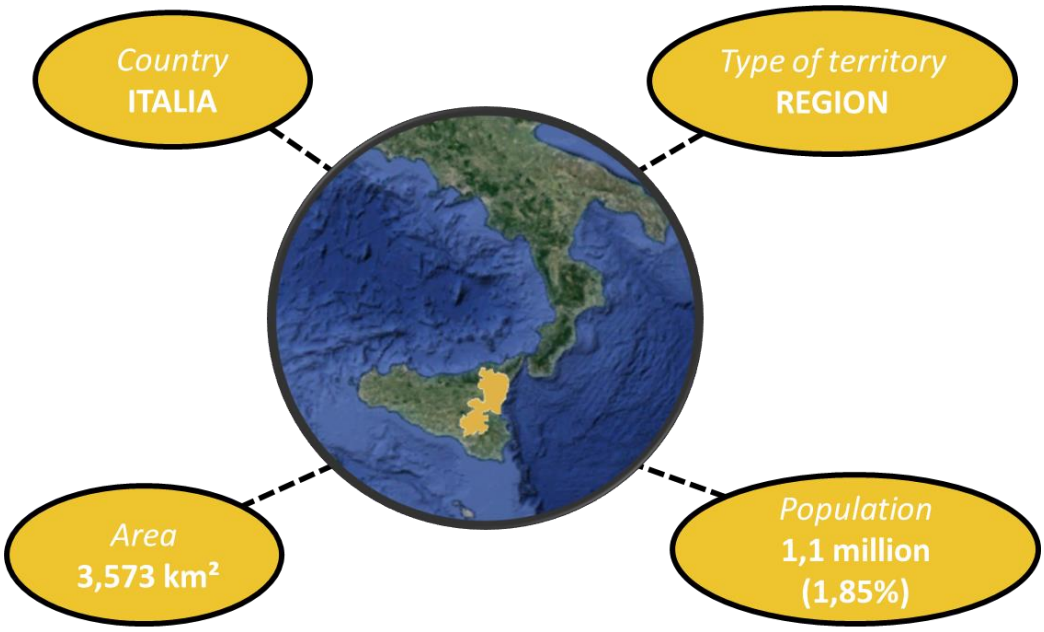
2.6.3 Electric mobility

Electric mobility is overall very underdeveloped compared to other European countries. The number of pure electric vehicles (BEV) in Greece and, consequently, in the Region of Thessaly, is negligible compared to the total fleet because of its excessive costs and lack of incentives. For now, the Greek strategy is to capitalize on the feedback of pilots. In that respect the Region of Thessaly has been participating in different European programs testing the use of light electric vehicles (ELVITEN) and autonomous electric vehicle (CityMobil2) for urban transportation.

Despite those positive initiatives, only two charging stations in the Region are to be reported in the Region. This situation could change rapidly thanks to the Parliament's willingness to promote electric cars and the present EnerNETMob program through which the Region wants to install three rapid chargers on the territory forming a West-East corridor.



2.7 Analysis of electro-mobility and energy supply in Città Metropolitana di Catania (Italy)

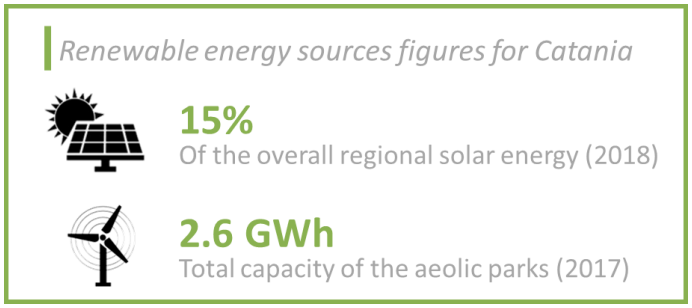


Located in Sicily, the province gathers its capital, Catania, to other villages of heterogeneous size to form a global population of 293 000 inhabitants. The territory is divided into a metropolitan area on the East coast, which concentrates the most population and economic activity, and a more rural area in the South dedicated to agriculture. The Etna volcano also represents a significant part of the territory and generates tourism activity.

The territory is composed of a dense road network and benefits from a motorway that offers a fast connected from Catania to Palermo. Transport infrastructures such as airport and ports also generate a high traffic in the area.

2.7.1 Energy

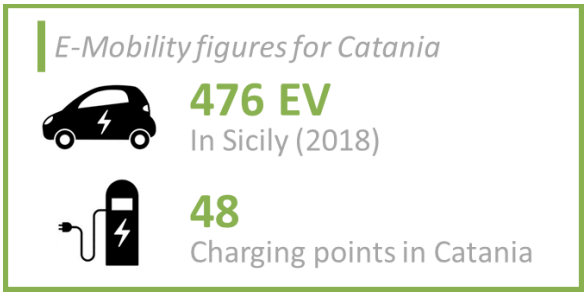
The Sicilian Region, compared to the other Italian Regions, is still playing a leading role in the production of energy from renewable sources. In this regional overall effort, the Province of Catania contributes with an important weight as regards several power generation sources, for example, the province produced 15% of the overall regional solar energy production in 2018. Wind power is also very developed in the region as it contributed in 2017 to 16% of the overall regional production, representing 2.6 GWh.



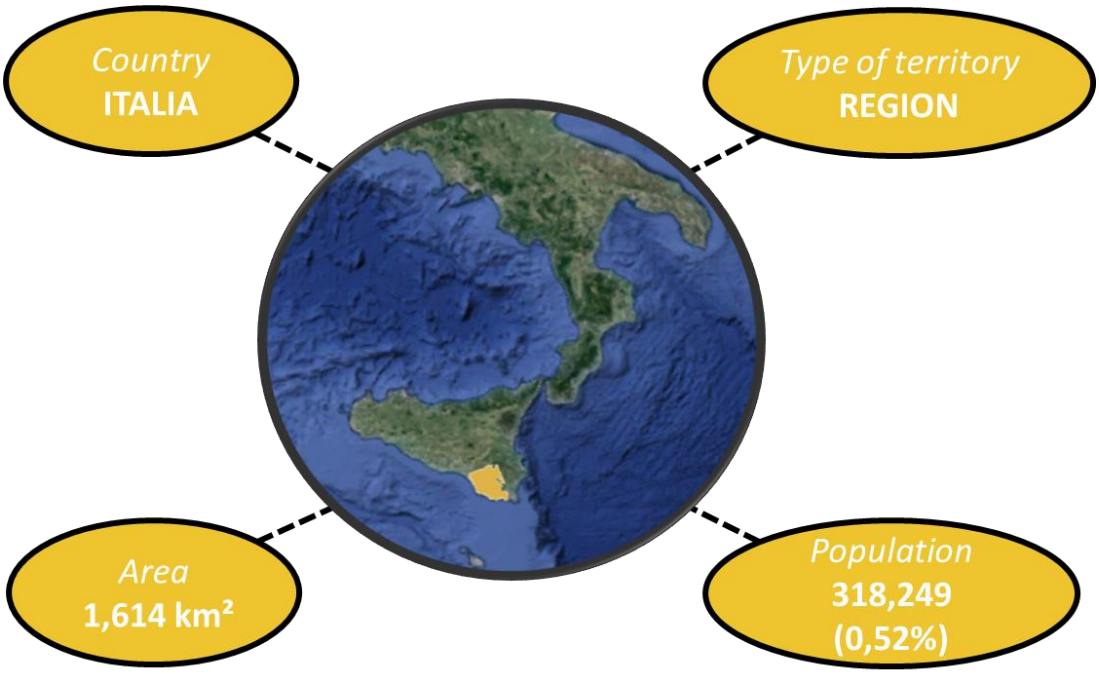
2.7.2 Electric mobility

A limited number of electric cars has been registered in Sicily (239 cars and 237 light utility vehicles in 2017) but the province is active in promoting electric mobility. Catania counts 48 charging points and plans to extend the network on both the municipal and metropolitan scales through a partnership with Enel and Europeans funds. The electrification of public fleets is also on the agenda as well as financial incentives.

Since electric mobility is already a reality in Catania, the province chose to dedicate the EnerNETMob project to the introduction of electric mobility for agri-food entrepreneurs involved in the short food supply chain. In this scheme, farmers deliver their products in local markets, targeted shops, online or through organized groups of consumers. The province wants to capitalize on the existing road infrastructure and the renewable energy production capacities to make this new way of consuming even greener. The location of the pilot project will therefore be set in the rural area of the province.



2.8 Analysis of electro-mobility and energy supply in the Province of Ragusa (Italy)



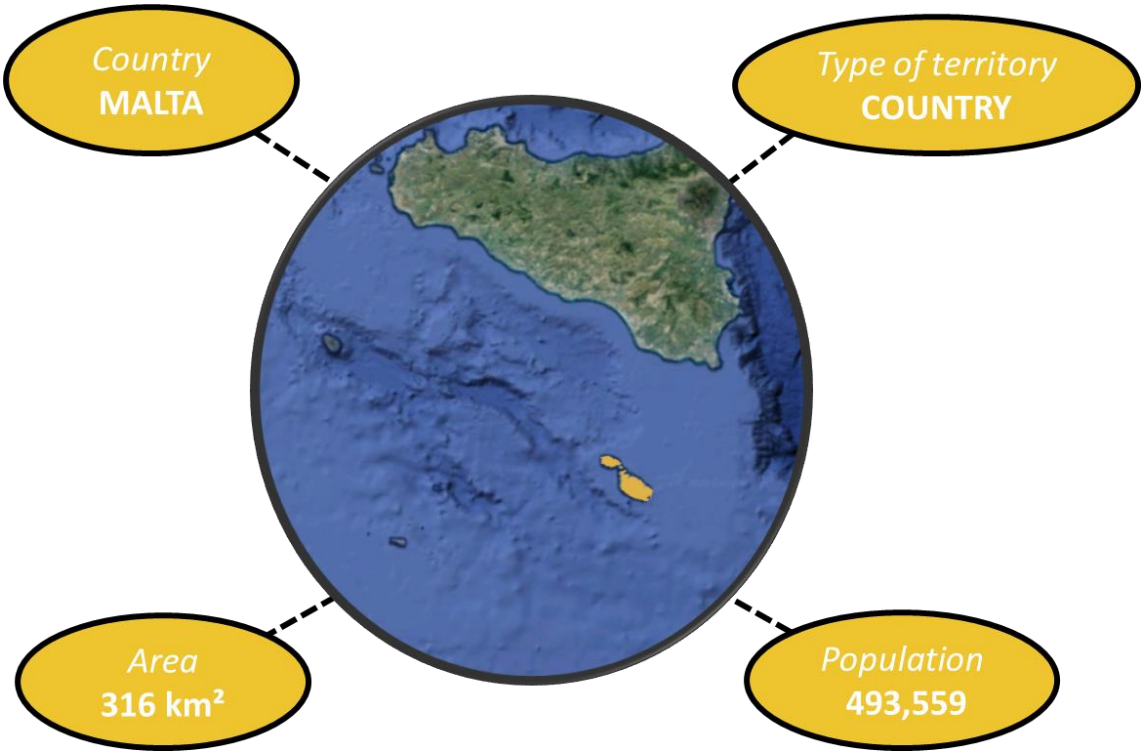
The Province of Ragusa is located in Sicily and gathers 12 municipalities, which are composed of a growing population of 321 000 inhabitants. Local economy is today mostly oriented towards services as the secondary sector declined over the years.

Compared to the metropolitan areas and other congested urban areas of Italy and Sicily, Ragusa Province stands as a weak demand area without very intense traffic zones. It is the only Sicilian province to be deprived of motorways. The Province is therefore connected to neighboring territories through local road network, the sea with a port of regional relevance and few lines of urban public transport.

Residents generate the majority of local mobility flows with a limited amount of commuters from other provinces and usually travel for work or study purposes to Ragusa, Vittoria and Modica. Sustainable mobility has already started to break through since car use has decreased by 10% for 10 years in favor of rail transport and cycling. In spite of those actions, transport still is a heavy contributor to carbon emissions as it represents 38% of overall CO_2 emissions. The main challenges the Province faces today regard the renovation of an aging public transport infrastructures and the creation of intermodal hubs.

Electric mobility is another way to decrease the transport contribution to climate change but is today underdeveloped. The number of hybrid or electric vehicles is still weak with less than 500 registrations. No alternative fuels infrastructure or EVSE network is installed in the local areas. Only private initiatives of sporadic EV charging points are registered in the zone without a real coordination of local authorities. This situation is due to change in the coming years as the local authorities are defining a EVSE network, which should implement the regional guidelines for electric mobility drafted by the Sicilian regional council.

2.9 Analysis of electro-mobility and energy supply in Malta



Malta is an archipelago located in the Mediterranean Sea nearly 93km south of the Italian Island Sicily. Even though Malta is a European island, it is located further south than some African countries such as the capital of Tunisia and Algeria. The population is unevenly distributed on the territory as close to 80% of the country's population lives in the metropolitan area of Valletta.

As an island territory, Malta's economy is highly dependent on imports: local food production covers only 20% of the population's needs. This also applies to fuel imports: this is why the development of electric mobility enabling the country in particular to reduce its energy dependence would be a considerable challenge, especially if it is associated with electricity production from renewable energies.

2.9.1 Mobility

The rate of motorization in Malta was 782 in 2017 per 1,000 total residents, which is significantly higher than the EU motorization rate of 584 as at 2017. This can be accounted for by the fact that Malta is the only Member State in the EU without a rail system. The lack of a mass transit system complementary to road infrastructures is one of the main contributors to the high motorization rate on the island.

2.9.2 Energy

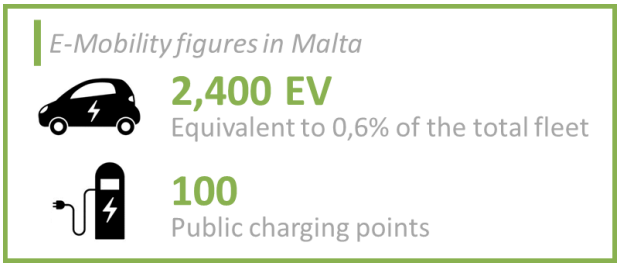
The country's target for RES share for the energy sector was set at 10% by 2020, the lowest goal in EU: in 2018, the share of 8% was reached, mainly due to photovoltaïc energy and heat generation.

The direct emissions from road transport amounted to c.550 Kt CO_2 equivalent in 2016. This figure represents an absolute increase of 12.6% over 2005 levels. This uptake in emission from road transport is reflective of the increasing motorization of Maltese, which along with the local residing population has been growing significantly over the last few years.

Managing the motorization growth and electrifying cars appear to be a top priority if Malta wants to reach its goals to limit by 2020 its increase in greenhouse gas (GHG) emissions to just 5% compared to 2005-recorded levels and have a share of 10% of all transport fuel consumption coming from renewable energy sources : in 2018, the share it reached 8%.

2.9.3 Electric mobility

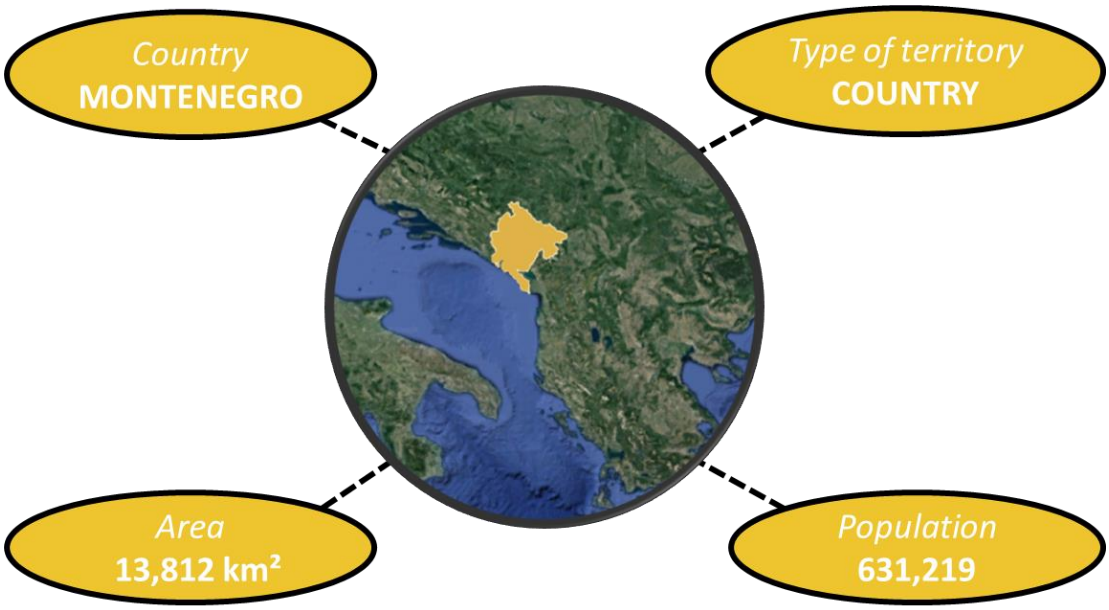
Malta defined in 2013 a national electric mobility action plan and governance that paved the way to financial incentives and the deployment of more than 100 public charging points. Thanks to generous grants, Malta managed to stimulate the EV market, which is today composed of more than 2,400 electric and hybrid cars and represents 0.6% of the total fleet. If the 2020 goal of 5,000 electric vehicles might not be reached, the EV market appears to be rising.



The country also participated in several different pilot projects to try out electric cars, charging technologies, shared mobility platforms, solar energy production and light electric vehicles.

The Malta National Electromobility Platform has designed a new and ambitious roadmap for the decade, which consists of direct incentives, infrastructure policies, awareness policies and pilot projects. It focuses on both the development of alternative fuels through new financial incentives and the introduction of the concept of Mobility as a service with a view to reach a shared and low emission mobility. Public authorities expect the current installed charging network to facilitate the uptake of the EV market in the coming years. To reach the goal of the 2020-2030 roadmap, Transport Malta has launched a concession tender, awarded to Car2go, to initiate an electric car sharing service that will deploy 150 vehicles and 450 exclusive parking spaces throughout the country.

2.10 Analysis of electro-mobility and energy supply in Montenegro



Montenegro is a Balkan country bordering the Adriatic Sea with a population of 631,219 inhabitants, 67% of whom live in urban areas. Montenegro has a small, open economy, with a high level of trade and investment integration with the EU and the other countries of the Western Balkans. Montenegro mostly relies on income from services and a booming tourism sector. The distribution of both population and income reflects accordingly regional disparities between a more populated and richer south (coastal and capital areas) and the less developed northern municipalities.

If the country suffers from a deficit of fast transport infrastructure, Montenegro is advanced as regards the transformation of its energy production system. Montenegro achieved in May 2019 to satisfy the whole electricity demand over a certain period from domestic renewable energy sources. The government aims at building additional renewable energy production capacities to produce electricity at 100% from renewable sources.

2.10.1 Mobility

Montenegro has not capitalized yet on its strategic geographical position but the situation is due to change soon. Authorities plan to develop a first network of highways in the upcoming future, including the Bar-Boljare highway, a road connection to Kosovo and a coastal variant of the Adriatic-Ionian highway – an expressway along the Montenegrin coast.

Building highways is of capital importance as road transport is expected to grow by at least 45% up until 2025 and another 25% up until 2035. Motorization of households increased rapidly in the past decade (over 40% between 2005 and 2015) and the blossoming tourist industry has resulted in a seasonal growth of the number of cars circulating. During the summer touristic season (June-September), traffic intensity is up to five times higher than the rest of the year.

2.10.2 Energy

Montenegro began to adjust the energy sector to the EU requirements with the adoption of the Energy Law, which transposes into national law many European directives. The government has drafted an energy policy strategy whose ambition is to reach a high quality, reliable and diverse supply of energy, mostly based on renewables. In 2018, the share of energy from renewable sources in gross final consumption was 39% exceeding the national target of 33% by 2020. In that respect, the development of e-mobility will open space for greater integration of renewable energy sources into the power system, reduce greenhouse gas emissions, local emission of pollutants, and dependence on imported fossil fuels.

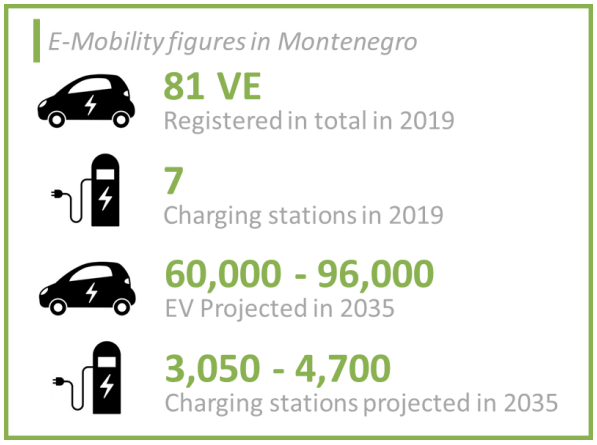
On a local scale, a couple of municipalities passed Sustainable Energy Action Plan (Podgorica, Žabljak, Kolašin), through which they commit themselves to reduce carbon emissions in all sectors and develop production of renewable energy.

2.10.3 Electric mobility

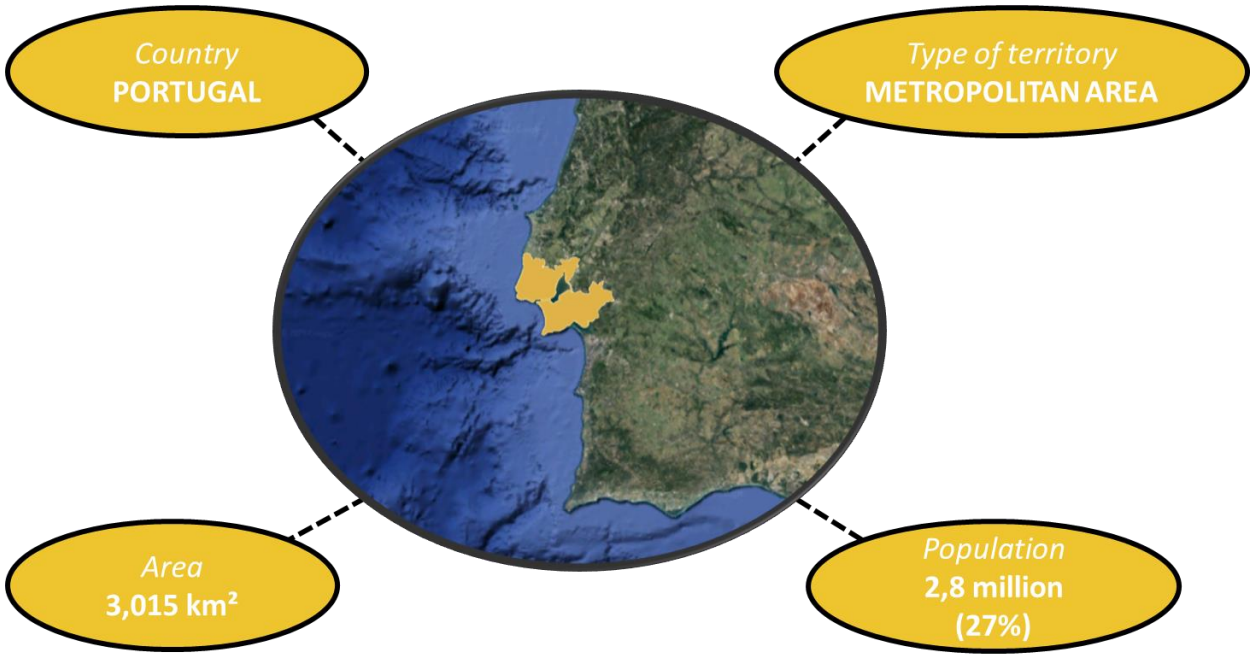
As the government has not conducted any incentive policy, electric vehicles have a negligible share in the structure of registered vehicles in Montenegro mostly composed of diesel cars. Consequently, the number of charging infrastructures is limited with seven stations only. According to a study conducted by the United Nation, the main obstacles to the development of an EVSE network are the insufficiently large e-vehicle user base and an inadequate regulatory framework, which affects the EVSE business model. Yet the country has already drafted a plan with indicative locations for a future network of publicly available charging stations.

One of the first type of users to target in a short-term perspective is tourist. The tourism sector is directly and indirectly responsible for a large share of GHG emissions, especially from the transport and accommodation. For this reason, the Ministry for Sustainable Development and Tourism of Montenegro and the United Nations have design a specific transport scheme for the town of Perast. The concept consists of improvement and maintenance of access to town, use of electric means of transport with limited use of private tourists' vehicles, and provision of adequate information for implementing tourism services.

In a long-term perspective, a prospective scenario assesses that the number of registered electric vehicles in 2035 in Montenegro could be between 60,000 and 96,000. The analysis has determined that the number of recharging points accessible to the public in 2035 in Montenegro shall be approximately 3,050 (including both slow and quick charging stations) to 4,700 according to the optimistic scenario. To reach this goal the government has been advised to create an incentive legislative framework to develop the market and business models for electric mobility.



2.11 Analysis of electro-mobility and energy supply in the Metropolitan Area of Lisbon (Portugal)



The Metropolitan Area of Lisbon (MAL) consists of 18 municipalities that gather approximately 2.8 million people, corresponding to almost 27% of the population resident in Portugal. It is defined by an urban network formed by a set of centralities with polarizing functions inside and outside the Region. The territory is heavily urbanized with 97% of households living in predominantly urban areas. This urban sprawling is the result of the loss of economic vitality of city centers, illegal occupation that fragmented the territory and fragmentation of rural areas.

With about 1.5 million jobs, the Lisbon Region is Portugal's economic backbone and concentrates the country's largest pool of skilled labor. Activities are oriented towards services, industries and tourism.

2.11.1 Mobility

Lisbon has been the main catalyzer for the development of the wider metropolitan area, and for that reason, its current mobility model is challenged by heavy daily commuting into the city center, which nearly doubles its population every day, from 560.000 residents to about one million users. 54% of daily commuting trips within the Metropolitan area are made by car, most of them coming outside of Lisbon, especially in the North of the territory. Public transport use has been decreasing over the years as motorization rate and quality of road infrastructure increased. It represents today 16% of daily trips.

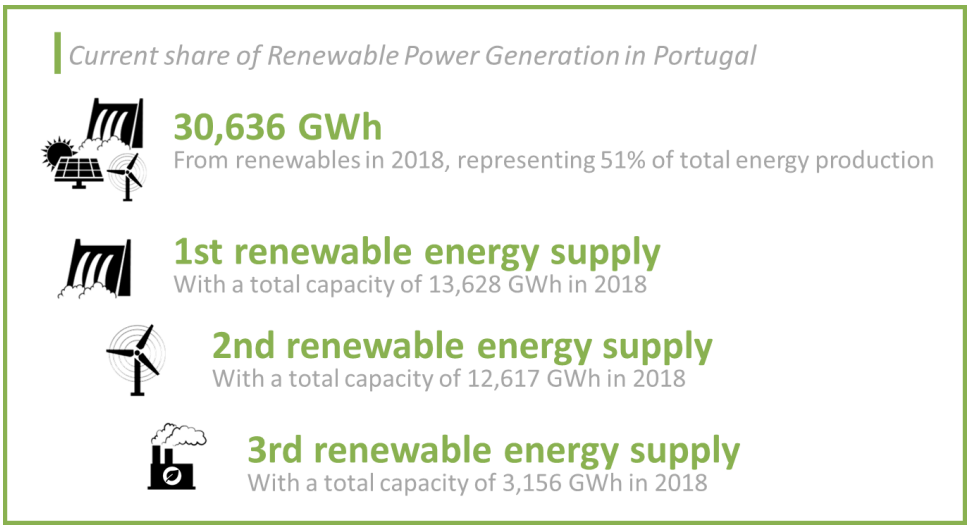
Modernizing the public transport infrastructure, creating a single transport pass and developing soft mobility modes are the main challenges for the Metropolitan Area of Lisbon to reach sustainability and controlling the motorization outburst. Electrifying the remaining vehicles will be obviously necessary to meet this goal.

2.11.2 Energy

The Region is committed to participate in the national plan to reduce around 50% to 60% of carbon emissions by 2050 compared to 1990 levels. The transport sector is, along with the electro-producer system, one of the main national GHG producers (representing about 25% of emissions), being the sector with the highest growth in emissions in recent decades.

Moreover, the Lisbon Region, along with the trend registered in the country, is characterized by a high energy dependence from abroad, mainly with regard to fossil fuels, also having an electricity importer balance. Developing renewables seems therefore to be a priority, as electricity is expected to reach a weight of around 70% of total energy consumption by 2050.

In 2018, the country reached the 6th largest share of renewable energy use in energy consumption with a total capacity of renewable power generation of 30,636 GWh.

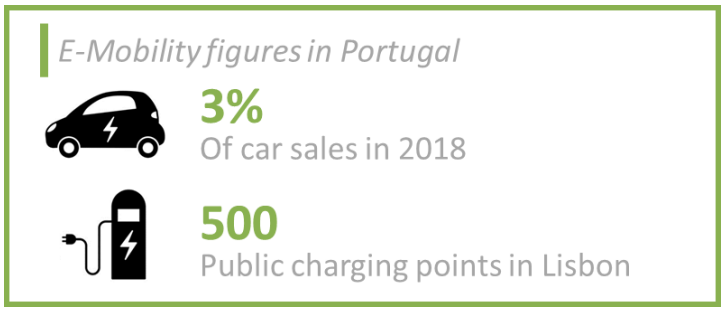


The same year, the city was awarded the title of European Green Capital 2020, assessing sustainability in the city and recognizing the work made by the city at developing a greener and people-friendly city. To maintain its involvement, the city has defined the « Lisbon Climate action plan » aiming to challenge companies and institutions to continue implementing sustainable actions.

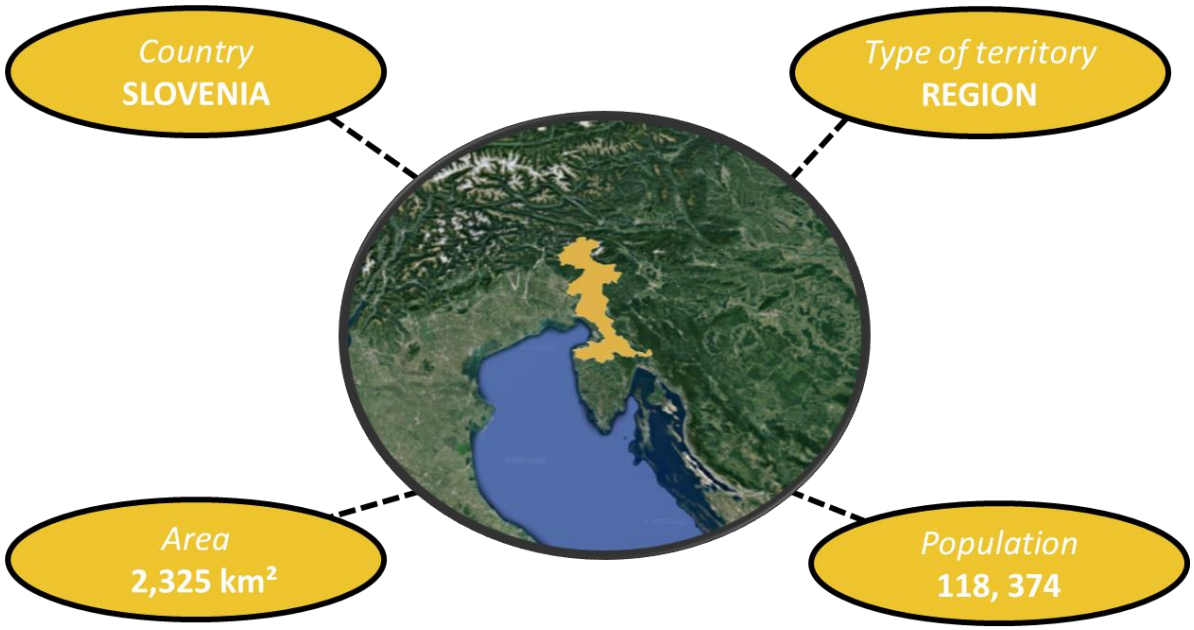
2.11.3 Electric mobility

The Portuguese EV market is one of the most promising in Europe as its share reached 3% of car sales in 2019 (Portugal's ambition is to reach 30% of market share by 2030 and 100% by 2050). This rise is the product of financial incentives, and deployment of public charging points. However, charging infrastructures have not increased as fast and Portugal today has a ratio of EVs per charging point inferior to the European average of 10. If a problem could be reported at this stage, it would be that the development of electric mobility has not been profitable to local economy yet as Portugal has not a structured ecosystem of companies in the sector.

As for the Metropolitan Area of Lisbon specifically, the ambition is to coordinate the growth of electric mobility with the urge of developing new modes of transport. As public authorities have to cope with a disinterest in the public transport infrastructure, the Metropolitan Area of Lisbon wants to stand as an international showcase for mobility, giving the opportunity to try out multimodal service offers, promote sharing modes or make mobility easy to users.



2.12 Analysis of electro-mobility and energy supply in Northern Primorska (Slovenia)



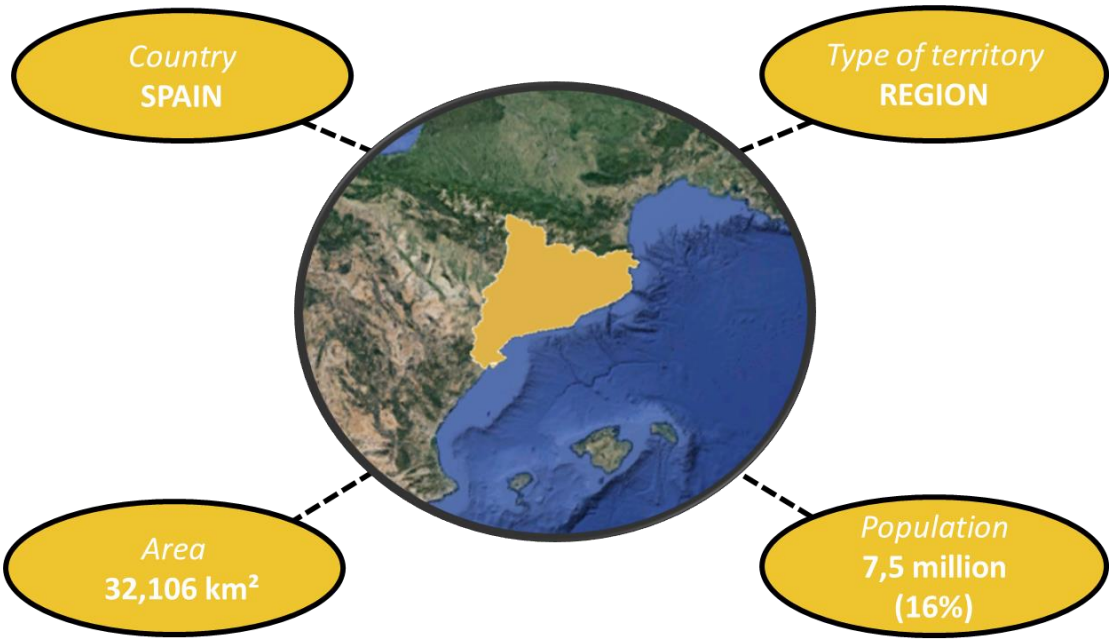
The Northern Primorska region is one of the largest Slovenian statistical regions, accounting for 11.5% of Slovenia's territory. Beginning in 2014, 118,374 people resided in the area. According to the Ministry for agriculture, forestry and food's data, 51,507 ha of agricultural land are predominant in the Vipava Valley and in the plains of the Soča River Valley.

Transport in Slovenia is one of the largest sources of CO_2 emissions (25% of the total) and energy consumption (20%) globally. Compared to some other countries, Slovenia has already designed a strategy to develop sustainable mobility through orientation tools (Sustainable Energy Action Plans and the Sustainable Urban Mobility Plans) and incentives directed to the EV market.

The popularity of electric mobility in Slovenia is rising indeed. The growth rate is every year higher. For instance, the number of registrations raised up to 2,123 cars in 2018. This is the result of awareness actions (eco campaigns) as well as combination of the governmental incentives (subvention, special loans, rising network of electric charging stations). Energy companies such as Petrol, Elektro Ljubljana and DEM have deployed hundreds of charging points across the country, including a fast-charging network along the main roads connecting main cities to neighboring countries (Italy, Croatia, and Czech Republic).

Slovenia is on the way to achieve the full electrification of transport by 2055 and aims at halving the energy use of petroleum products by 2035, which should decrease carbon emissions by at least 35% compared to 2005.

2.13 Analysis of electro-mobility and energy supply in Catalonia (Spain)



The autonomous community of Catalonia forms a triangular area in the Northeastern corner of Spain and is composed of 7.5 million of inhabitants (16% of the whole Spanish population). The Catalan economy has a strong industrial tradition, which places the secondary sector much higher than the average value of most European countries with a part of 21.4% of the gross value added. Tourism plays also an important role in the Catalan economy, as it represents about 12% of GDP, most tourists coming from abroad.

The Metropolitan area of Barcelona is the most dynamic part of Catalonia. It does not only include the fully urbanized areas of the Barcelona plain but also the rural areas of Llobregat Delta and the large green areas of the massifs of Garraf and Collserola and Marina mountain range. The Metropolitan area is unsurprisingly the densest territory of Catalonia.

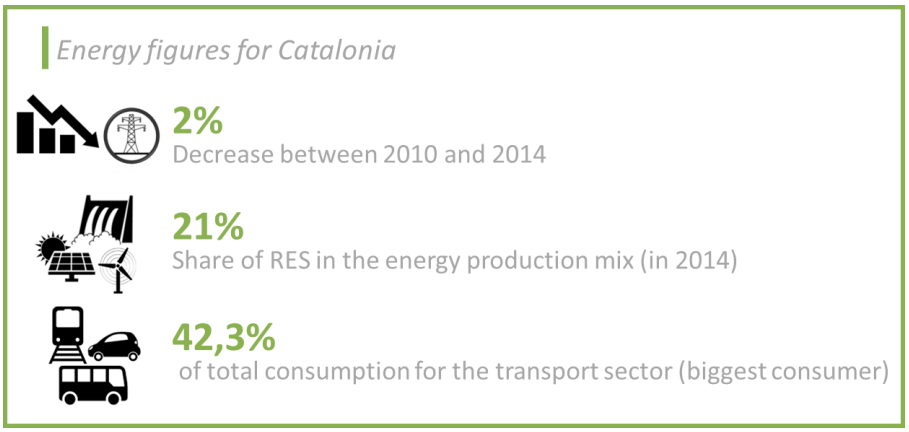
2.13.1 Mobility

The total number of circulating vehicles in Catalonia significantly rose from 1991 to 2008 with an average growth of 1.9% per year but has been slightly decreasing for few years. The level of motorization is still high with 520 vehicles per 1,000 inhabitants. Tourism is reported to be the main contributor to the motorization rate of the region. Within the Metropolitan area of Barcelona, private vehicles are the most used means of transport for interurban flows and the second for urban trips, though its modal split has been growing for the past years. The part of walking for non-motorized modes has decreased in favor of public transport and bicycle.

Overall, the automotive market changed in the past two years as the number of diesel cars registrations have decreased in favor of gasoline and alternative fuels vehicles.

2.13.2 Energy

The energy production has been shifting for the past 20 years from a nuclear-based system to multiple sources with a total share of 21% for renewables. Catalonia has also strengthened its production capacity since 1990 even though the demand for electricity has been decreasing every year since 2010. This fall can be accounted for by the economic crisis and its impacts on the industrial sector. Transport continues to be the biggest final energy consumer in Catalonia, accounting for 42.3% of total consumption.

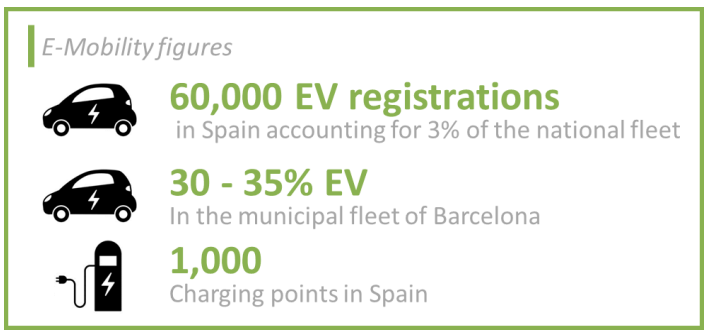


2.13.3 Electric mobility

The electric mobility ecosystem in Spain is mature, especially in Barcelona, which counts more than 60,000 electric car registrations (3% of national EV fleet). Public authorities in collaboration with private companies offer different kinds of incentives to promote electric mobility (subsidies, reduction of registration tax and circulating tax, free parking and use of bus lanes) and install a growing number of semi-rapid and rapid public charging stations. The City of Barcelona administration itself has electrified between 30% and 35% of its municipal fleet to show its exemplarity.

The Metropolitan area of Barcelona has not only been granting incentives but also building up constraints to the use of conventional cars. In order to control heavy traffic and fight pollution has enforced since 2017 a low emission zone, which ban within the city the most polluting vehicles.

In this context, the pilot action that will be carried out to operate an existing charging point to deploy an EV sharing service offers a double incentive: the possibility to reduce the use of private vehicles while respecting the city goal to ensure the transition from internal combustion vehicles to alternative-fuel vehicles.



3 Comparative analysis of Partners' reports regarding the Pilot 1 "Intermodal Sea-Road Electromobility Networks, linking islands and coastal regions"

Over the years, the territories (continent, country, region) have been built around the available primary resources and their topography. Today, the evolution of existing systems is influenced by new challenges mainly dictated by the willingness of territories to be increasingly attractive while ensuring mobility infrastructure services that meet the needs and uses of citizens.

For territories integrating island entities or exchanging with neighbouring oversea countries, one of the specific issues is to be able to guarantee a modality between the transport networks (road / sea) in order to allow population and goods to circulate easily. Electromobility is not immune to this problem, and that is why some territories are already looking for intermodal sea-road electromobility networks.

Among them are:

- **Albania – Country scale**
- **Croatia, Primorje and Gorski Kotar County – County scale**
- **Montenegro – Country scale**
- **Greece, Thessaly Region – Regional scale**

3.1 Land use analysis of local system and their connections

The four territories covered by this analysis are located in the Balkan Peninsula in the South Eastern Europe, thus sharing geographical characteristics (proximity to Central Europe and/or wide coastal strip) that conditioned the development of their economic activities.

Territories topographies

The Croatian county of Promorje and Gorski and the greek region of Thessaly reliefs share similarities: a wide coast, a mountainous terrain inland and islands off the coast. In Croatia, 3 regions can be identified, each characterised by a dominant relief: Gorski Kotar – the mountainous inland of the county (35% of its area), 37% of continent coastal area in the Kvarner Gulf and 28% of islands. In Thessaly, the mountainous terrain is mainly the region of Trikala (71%) in the west, the center of the territory consists mainly of plains - 49% for the region of Larissa - and finally the coast which covers the majority of the Magnesia region. The Albanian territory is also characterized by a mainly mountainous relief with an interior of the country hosting several mountains to the east, such as the Albanian Alps to the north, the Sharr Mountains to the north-east, the Skanderbeg Mountains in the centre, the Korab Mountains to the east, the Pindus Mountains to the south-east, and the Ceraunian Mountains to the south-west. In the west, on the other hand, there are plains and plateaus along the Albanian Adriatic coast. The terrain in Montenegro is divided into high mountains in the northern part of the country, karst segments in the central and western part, and up to almost 300 km from a narrow coastal plain.

This geography has conditioned the development of territories with predominantly rural mountain areas and, in contrast, the plains or coasts are home to urban centers.

Territories spatial organization

The population evolution is comparable for three of the territories, excepting Montenegro. Indeed, for several years, a decrease of the population is visible in Albania, Greece (-2.4% over 10 years and also perceived at the national level) and Croatia. Beyond a natural decrease of the population this phenomenon is completed in Albania by a strong emigration. However, this trend is not observed in Montenegro which is planning a growth of 0.2% in the coming years.

For all the territories, the population is concentrated in the urban centers, vectors of economic activity: in Albania 53.4% of the inhabitants live in the city, and more particularly, in the metropolis of Tirana-Durres, an area developed between the coast and the back plain resulting mainly from neglect of rural areas; 44% in Greece (40% in rural areas and 16% in semi-urban areas), mainly in the regional capital of Larissa and Volos. This phenomenon is even greater in Croatia where the rural area can essentially be combined with the mountainous area of the territory, the Kvarner Gulf coast concentrates 80% of the population. In Montenegro the coastal South, where the capital of Podgorica (185,937 inhabitants) and the other urban centers were developed, has more inhabitants than the northern municipalities.

Land use analysis of local system and their connections - Key elements

The territories mountainous topographies and the opportunity for economic development around maritime activities explain the development of urban centers on the coasts or close inland plains.

This position allows not only interregional and / or international exchanges with the inland territories but also outland ones, these resting on the good functioning of the mobility infrastructures.

3.2 Socio-Economic Framework

Although the studied territories do not cover the same areas and scales, we observe that they all show economic growth resulting from the respective development of their activity sectors.

Population dynamics

At the national level, Albania and Montenegro both plan to maintain respectively 3.8% and 4% GDP growth until 2020. At the regional level, “Promorje and Gorski” is the second most developed county in the Republic of Croatia and Thessaly is the third region among the 13 Greek existing, accounting for 5.2% of the national (GDP). In Albania, the Tirana region alone accounts for 1/3 of the country's GDP, making it the most developed region.

Activity and economic sectors

The position of the Croatian county in its economy is based on its strategic geographical location giving it the opportunity to develop seaports, maritime traffic, shipbuilding and tourism activities of great significance for the whole Republic of Croatia.

For the other territories, activities are more specifically differentiated by sector (primary, secondary and tertiary). All of them are represented but have been developed with regard to each territory resources:

- The primary sector is mainly developed around agriculture: in Albania, it is based on medium-sized family-owned dispersed units and remains a significant sector of the economy of Albania (employing 40% of the population, and covering about 24.31% of the land). In the Thessaly region, it represents 12.3% of the Gross Value Added and is based on the production of many agricultural products: wheat, cotton, cereals, tobacco and Protected Designation of Origin products. Currently, forestry and fishing represents only a small contribution in the sector but the mix may change in the coming years in favour of those activities due to the development of mountainous areas and the reduction of the pollution in the coastal zone. In Montenegro, this sector accounts for only 7% of the country's gross domestic product, far behind the other sectors.

- The secondary sector associated with the transformation of raw materials: for Albania, this sector is very diversified and is based on electronics, manufacturing, textiles, food, cement, mining and energy. In the Thessaly region (and more specifically in the Larissa-Volos area), it represents 17.7% of Gross Value Added and relies strongly on manufacturing (manufacture of furniture, manufacture of wood and of products of wood, manufacture of basic metals and manufacture of fabricated metal products). The industrial sector in Montenegro is mainly driven by the manufacturing industry and represents 16% of the gross domestic product.

- The tertiary sector constitutes the largest part of the existing economic activities. In Albania, it contributes to 65% of the country's GDP and employs 36% of this sector active population. As for the main activities, the banking industry became since the end of the 20th century, a major component and remains in good conditions overall due to privatization and the commendable monetary policy. In Thessaly, it covers 70% of Gross Value Added and has been gradually growing by means of public research centres (mainly in Volos because of the existence of a dynamic university that implements research and development projects) and other activities such as tourism, retail and wholesale trade and transportation services (Trikala, mainly due to the crossing of two great commercial routes, both from Epirus and Macedonia, represents an important commercial hub and a pole of attraction). The service sector is predominant in the Montenegro's economy. Mainly based on tourism, it accounted for 59% of the GDP in 2018.

It is important to note that tourism plays an important role in the tertiary sector not only in Montenegro. Indeed, for Albania tourism is recognized as an industry of national importance and has been steadily increasing since the beginning of the 21st century and accounting for 8.5% of GDP in 2017. The Regional Unit of Magnesia in Thessaly hosts a dynamic tourism sector contributing significantly to the economy of the region. It is due mainly to the privileged location of Volos and its port (connecting Volos with the Sporades islands and serving cruise and freight ships).

Employment market

These economic activities generate employment for the territories inhabitants. Thus in Albania, 35.94% are employed in the production of goods sector, 64.06% in production of services sector within which 6.97% work in transport, information and communication sector. The Croatian county observed since 2013 an increase in the number of total employees up to 4.7% between 2016 and 2017.

Nevertheless, we still observe unemployment rates between 10 and 26% for the territories studied: the highest is found in the region of Thessaly in Greece where between 2014 and 2016, the average was 25.9%. In Montenegro, this figure drops below the 20% mark with a 17.8% unemployment rate. This rate is unevenly distributed among the population, affecting mainly the population minorities who have suffered from social exclusion: pensioners, women and groups with a history of social exclusion, such as sexual minorities, people with disabilities, the Roma community or refugees. In Albania, the estimated unemployment rate of 12.3% has been steadily decreasing since 2014, thanks in part to the economic recovery that took place following the financial crisis and young population migration flows.

Socio-Economic framework - Key elements

Although the 4 territories share similar geographic features because of their proximity, their economies have adapted to exploiting the resources at their disposal. As a result, their economic development has not followed the same growth and each territory presents its own challenges today. In Albania, the government wants to reduce inequalities between rural areas and Tirana-Durres metropolis, which have split the territory for the last 20 years. The challenge is to create larger local units that provide public services in a more efficient way, and the usage of the financial resources in order to respond better to the needs of the citizens.

This urban-rural territorial dichotomy also affects the Greek region whose development remains rather focus on the central regions than towards those of the West (mountain ranges separating them from the rest of the country). The challenge is to cope with these population movements by anticipating the development of transport axes and infrastructures in urban areas as well as urban sprawl due to the concentration of population.

The Croatian county established a strategy for its development by identifying priority activities aimed at strengthening the potential development of the county while reducing disparities especially between the port of Rijeka and the rest of the county.

For Montenegro, a rapidly changing territory, the challenge is to continue to develop its economic activities since the country wants to join the European Union (since June 2012 Montenegro has been involved in accession negotiations with the EU) by for example diversifying the existing tourism sector to attract a new audience. At the same time, the country gradually defines the living environment it wants to offer to its inhabitants on the socio-economic level. Electromobility fits perfectly into this approach since it will enable the country to position itself and show its commitment to current issues.

For territorial development to be homogeneous, the authorities must ensure exchanges between all continental and island regions and facilitate them by developing adapted transport networks. Indeed, the development of territories is intrinsically linked to the development of transport networks, vector of population and resources movements. The variety of its networks, their frequentation and their evolution reflect the attractiveness and the function (hub, transit axis, ...) of a location.

3.3 Transport Framework

3.3.1 Transport supply

First, we will compare the existing transport networks in each of the territories studied.

Road transport

For all the territories, the road network is the most developed one, since historically it is the first to appear to facilitate travel and the least expensive to set up. Over the years, other infrastructures subsequently complete or reinforce it according to the needs of the inhabitants.

Three of the territories (excepting Greece) integrate the **European Union's Trans-European Transport Network (TEN-T)** connecting the Balkan countries with the aim of attracting international traffic flows:

- In Albania, the TEN-T is part of the corridor VIII and goes from Tirana to the South West coast and, through the East portion connects the country to the North Macedonia.
- In Croatia, the two TEN-T core network corridors pass through the country: the Mediterranean Corridor (Vb) and the Rhine-Danube Corridor.
- In Montenegro, there is no highway, but only regional roads belonging to the network connecting the country to Serbia in the North, going through Podgoria and joining the sea in the south East coast.

In addition, the territories host a national network consisting mainly of motorways (with the exception of Montenegro), a regional network and a local network. In Albania, the National road network connects with primary roads and secondary roads all major cities and touristic centres, carrying the vast majority of the traffic of the country whereas the Regional & Local Network is made of district and communal roads.

The Croatian territory is extremely transient in terms of traffic, it hosts 3 motorway sections (A1/A6/A7) representing 8.9% of roads. In addition there are: 33.4% of state roads, 36.8% of county roads and 20.9% of local roads. The quality of road infrastructure depends on its use : the highways and state roads are of relatively good quality (used for freight transport), while the county and local roads show a lower quality level.

In Montenegro, local roads account for ¾ of the network the other quarter being regional roads (with some, as mentioned before, belonging to the European network). Regarding highways, a planned network is to be developed in the coming years and constituted of:

- the Highway Belgrade – South Adriatic through Montenegro: Boljare – Mateševo – Bratonožići - western bypass of Podgorica – Bar;
- Connection of the highway Belgrade - Bar with Kosovo, the part through Montenegro: Andrijevica – Murino – Bjeluha (the border with Kosovo);
- Section through Montenegro of the Adriatic-Ionian highway: the border with Republika Srpska in the area of Trebinje – Čevo – Podgorica – Božaj (the border with Albania)

In Albania, the road network is supplemented by a rail network but has had a steady decline in the past 10 years. It can be described as the least developed and least attractive rail sector in the Western Balkans (together with the rail sector of Kosovo). The country's most important infrastructure facilities take course through both of the cities of Tirana and Durrës, connecting the north to the south as well as the west to the east.

Maritime transport

As mentioned before, all territories have a wide coastal strip, making maritime transport an integral part of the overall economic sector. The Albania's port system is made of four major port authorities that aggregate shipping, port and other maritime activities: Durres, Vlora, Shengjin and Saranda. It connects the country through sea to Italy. The port of Rijeka is the largest and most important Croatian seaport and represents the front door of Europe for the Far East.

In Thessaly, the port of Volos, build in the Pagasetic Gulf, is the only outlet towards the sea. Due to its central location and its proximity to Athens and Thessaloniki (under 350 km) the city is bound to become the third of the major commercial ports of Greece, connecting the country with the Middle East and the North – South European network. As a result, the city has contemporary infrastructures, connecting the city and the port with the mainland through the road and railway network. Moreover, during summer maritime transport is all the denser since to commercial flows can be added the transport of tourists who pass through the port to reach the Sporades Islands.

EVSE (Electric Vehicle Supply Equipment) network

The electromobility sector is a new one for most territories and is growing:

	2017	2018-2019	Tendency
Albania	64 EV	137 EV (in 2018)	+114%
Croatia county	96 EV	177 EV (in 2018)	+84%
Thessaly region - Greece	23 EV	NA	NA
Montenegro	49 EV	81 EV (in 2019)	+65%

The development of EVSE infrastructures has followed the evolution and concentration of the EV fleet.

The Croatian county hosts the most developed and efficient public charging service compared to the covered area. There are 54 charging stations (equal to 151 charging points) accessible to the public to cover the charging needs of the 177 circulating EV. There are mostly located on the Kvarner coast and in the islands and offer mostly a charging power of 22 kW.

In Albania, no electric cars existed until 2014. At the end of 2018, 137 EV representing 0.03% were on the roads resulting in a charging network of only 24 charging points mostly located in the city of Tirana. The first charging points were introduced by the public taxi companies with 4 different companies operating with 100% EV. Among the 24 existing charging points only 3 were installed by the Municipality and are open to the public. Others are reserved for the police force private fleet (10 charging points for their 11 EV), 5 for the taxi companies and 6 for the Post office fleet of 12 EV.

In Montenegro, there are only 81 EV on the roads (49 EV in 2017) and 7 charging stations (5 stations located on the sea coast and 2 stations in the capital city of Podgorica), mostly offering lower power charging.

The Region of Thessaly doesn't host any charging point open to the public, only private business initiative exists (hotels, …) reserved for their clients.

3.3.2 Transport demand

In line with the development of transport networks, road transport remains the predominant mode of transport for both passengers and goods.

In Albania, this was particularly the case as during the last decade it has been receiving the bulk of the transport infrastructure investments. The road traffic of the territories gets denser as one approaches the urban areas of the largest cities and the interurban network which connects these cities. (Tirana region in Albania, Kvarner bay in Croatia, cities of Larissa, Volos, Trikala, Karditsa and Elassona in the Thessaly region). Beyond this localized phenomenon, all the territories observe a strengthening of road traffic during tourism season.

Vehicle fleets in the countries studied are still highly emitting, making road transport the largest contributor to CO2 emissions among the different sectors. For this reason, **promoting the use of public transport and electric transport is particularly important for promoting a sustainable mobility model.**

EV market and evolution

Over the latest years, the EV sector has been increasing in all territories. In its prospective scenarios, Montenegro has estimated by 2035 60.000 registered EV among 284.000 personal vehicles (around 20% EV fleet) for the realistic scenario and 96.000 registered EV among 329.000 personal vehicles (around 30% EV fleet) for its optimistic scenario.

This growing trend, which will continue in the coming years in the light of territorial depollution objectives by reducing greenhouse gas emissions, requires the development of recharging networks.

The implementation of charging points in the framework of EnerNETmob project addresses this issue. Greece would rely in particular on this network to connect the west side - the city of Igoumenitsa - to the city of Volos on the East coast through the regional capital of Larissa.

However, nationwide deployment initiatives that would complement the proposed network are still virtually non-existent: for example, as part of the current infrastructure road projects in Montenegro, the electromobility infrastructure is not planned.

Transport framework - Key elements

The development of road infrastructure and the place of the individual vehicle in the modes of transport of in these territories are favorable assets for the development of electromobility, the latter not requiring new support infrastructure outside the charging stations.

These networks are gradually becoming denser, however, as the market tends to evolve towards this mobility, the territories must develop a recharging network covering all the identified needs, in order for this evolution to be homogeneous. As economic centers, the installation of charging points near marine / land exchange hubs is essential for building intermodal sea-Road Electromobility networks, linking islands and coastal regions.

3.4 Energy Framework

Overall, the territories have seen their energy consumption increase in recent years, although the changes have followed the economic difficulties encountered.

Energy consumption and its evolution

In Albania, final energy consumption grew gradually between 2007 and 2018 before seeing a contraction in 2012, coinciding with the slowdown in the Albanian economy. However, despite GDP growth remaining subdued, energy consumption nevertheless rebounded sharply in 2013 mainly due to increased residential demand. It then saw a further increase in 2014 driven primarily by the iron and steel sector, and continued with this level of increase until 2018.

The trend of final energy consumption in Greece has changed during the period 2000-2016. During the period 2000-2007, a total increase of final energy consumption by 18% occurred, mainly because of the economic growth of the country and the new habits that were adopted by final consumers. However, both the implementation of measures to improve energy end-use efficiency and the economic recession, have resulted in a significant reduction of final energy consumption in 2008-2013. In the period 2014-2016 a total increase in the final energy consumption by 8% was observed, caused mainly due to the increase of both petroleum products and electricity.

In Croatia, the energy consumption for Primorje-Gorski Kotar, Istria and Lika-Senj Counties represent 17.5% of the national consumption and has followed an increase rate of 1.44% between 2016 and 2017.

This growing trend leads to problems in the energy supply of territories:

- Ensure security of supply through better use of power and through alliances with neighbouring countries;
- Diversify the energy mix production
- Develop of a viable and sustainable development of the energy sector.

Energy production and evolution of renewables

In this context and taking into account the various energy objectives of the territories, the production mix shifts towards a better share of renewable energies. In Albania, the share of RES in the overall energy of Albania is largely determined by hydropower and firewood. In 2015, the share of renewable energy was 34.9% where more than 95% of energy was provided by hydropower stations.

For its part, the Croatian county produces 31,3949 MW (60% electricity and 30% thermal power) from renewable energies - mainly from photovoltaics (27.5%) and biomass (63.5%). The majority of PV plants are in Kvarner Bay (coast and islands) while biomass production is carried out inland.

The region of Thessaly has developed the most RES on its territory as wind power, photovoltaïc, hydroelectricity and biomass can be found: the region hosts two aeolic park with a total production capacity of 18.6 MW, it also operates 19% of photovoltaic power plants in Greece and 10 hydroelectric plants. Finally, the region has also biomass power plants, resulting from crop residues stems, pruning branches, animal waste, logging residues and industrial waste, that account for only 5% of the installed capacity at national level (44 MW). However, in Thessaly is located the largest biogas power plant in Europe. Its capacity is 5,252 MWe and will harvest about 300,000 tons of animal and plant waste from about 100 livestock and processing plants as raw material.

Energy framework - Key elements

As mentioned earlier, the development of the electromobility market is intrinsically linked to the development of charging infrastructure. However, the increase in the number of these infrastructures results in an increase in electricity consumption and, if their integration is not anticipated, it risks creating constraints on the electricity network. In addition, the role that electromobility can play in reducing greenhouse gas emissions is highly dependent on the energy source from which the energy consumed is produced.

Thus, considering the development goals for renewable energies and their potential one each territory, the EnerNETMob project could exploit the opportunities for partnerships with renewable energy generation especially regarding photovoltaïc as these Mediterranean countries benefit strongly from a strong annual radiation. However, considering the intermittence of RES generation the integration of a storage system is essential to absorb pic demand related to charging infrastructure and avoid weakening the electrical grid.

3.5 Analysis of ongoing plans

3.5.1 Land use and regional plans

In general, the territories have established land use and regional plans to address the socio-economic problems identified while ensuring its sustainable development.

The first problem identified by Albania regarded mainly its administrative organization in the management of territories. Therefore, the country has implemented a reform to resolve the inefficient and highly fragmented territorial and administrative division of the country. It then ensured to plan the development of its territory mainly focusing on the rational use of land and natural resources; assessing the actual and future potential of the territory development on a local and national level by balancing natural resources with economic demand and public and private interests. The same law defined an obligation for Albanian municipalities to draft, approve and implement the General Local Plans, aiming to plan the development of cities in terms of: Urban Regeneration, Mobility, Tourism, Environment, Infrastructure, Transport, Economy, Communication (Smart City), Culture and Agriculture.

Sharing the same environmental considerations, the Regional Spatial Plan of the Region of Thessaly main objectives are strengthening the role of the Region at national and international level, by exploiting its comparative advantages with promoting a sustainable, balanced and integrated development of the Region in accordance with its physical, economic and social peculiarities, notably by preserving the biodiversity, promoting natural and cultural resources, preventing pollution and improving the quality of life.

The Croatian territory is affected by national and European strategies for the development of the region. At the European level the strategy, regarding the Adriatic and Ionian Region, is to preserve, protect and improve the quality of the environment, increase the attractiveness of the region, and improve access to tourism products and services for senior citizens, people with disabilities and low-income groups. However, this strategy must be able to be developed in parallel with the national strategy focusing on the long-term economic, social development and environmental protection of the Republic of Croatia and the challenges of reducing territorial disparities by strengthening and building the less developed parts of the country.

In Montenegro, directions have been established in 3 main policy fields to be developed between 2018-2021: the first one regarding ensuring a smart, sustainable and inclusive growth aiming to improve all sectors (business environment, SMEs, manufacturing, agriculture, forestry, energy, transport, labor market, education, sport) while perpetuating their activity.

Land use and regional plans - Key elements

When implementing the charging infrastructure envisioned by the pilot projects, it will be necessary to choose a location that fits in the various territorial plans and to respect the existing Spatial Development and Construction of Structures. Indeed in Montenegro, a law governs the system of spatial development, the manner and requirements for construction of structures, and other matters of importance for the spatial development and construction of structures. There is a specific procedure for the deployment of an EV charging stations.

3.5.2 Mobility plans

The development of mobility plans at different scales is not necessarily at the same level of progress. Some territories have action plans defined at national or even local level in its SUMPs and cover this issue while for others, SUMPs have not yet been drafted and do not address the subject directly.

In Albania, electromobility and the development of associated infrastructure are not included. The issue is generally present and incorporated in some government strategic documents or energy efficiency measures related to transport with effect to electromobility.

As the SUMPs are being validated or developed, in Albania, for the cities of Durres, Shkodra and Tirana (which their content treat also issues of transport, infrastructure and mobility), there is therefore only the Governement objectives, with regard to transport, to find opportunities to reduce air pollution, based on future developments by:

- An incentive program to remove from circulation the most polluting vehicles and ensure that all vehicle models coming to Albania meet European emission standards;
- Strengthen the control of vehicles emissions in roads and apply fines if the vehicles do not meet the set requirements;
- A national road fare scheme;
- Implement the vehicle emission control as part of the annual technical control of vehicles;
- A program to increase low emission vehicle;
- Promote the use of cleaner fuels and vehicles through differentiated taxes.

In Greece, the cities of Larissa, Elassona, Trikala, Karditsa and Volos are subject to SUMPs (completed, under completion or awarded) which acts as a guidance note including best practices in Sustainable Urban Mobility Planning. Indeed, a SUMP's central goal is improving the accessibility of urban areas and providing high-quality and sustainable mobility and transport to, through and within the urban area. It regards the needs of the 'functioning city' and its hinterland rather than a municipal administrative region.

Montenegro developed a mobility plan named “Polycentric Sustainable Urban Mobility Plan for Boka Bay and the Old Royal Capital Cetinje 2016-2020” and it represents the results of the project “Development of Low Carbon Tourism in Montenegro” launched by the United Nations Development Programme (UNDP), aiming at improving transport infrastructure, within the framework of developing sustainable tourism in Montenegro. They were based on existing planning practice and take into account an integral, participatory and evaluation principle to meet the needs of the population cities for mobility and ensure better quality of life in cities and their surroundings.

- This Sustainable Mobility Plan aims to create a sustainable urban transport system that:
- Ensures the accessibility of jobs and services to all;
- Improves safety and security;
- Reduces pollution, greenhouse gas emissions and energy of people and goods;
- Increases the attractiveness and quality of the urban environment

In Croatia, the existing plans cover the entire country, including the following « Transport Development Strategy of the Republic of Croatia » year 2014-2030 et 2017-2030 aiming to improve regional cohesion in passenger transport by enhancing territorial cohesion, improving accessibility in passenger transport within and towards major urban agglomerations, and improving the transport system in terms of organization and operational structure, with the aim of ensuring the efficiency and sustainability of the system itself. While implementing measures to reduce the impact of the transport system on climate change for 6 transport sectors: rail, road, air, maritime and inland navigation, public urban, suburban and regional transport.

Mobility plans - Key elements

We note that the territories are not at the same stages of progress. And although the SUMPs of some have not been drafted, the innovative nature of the pilot project foreseen and its inclusion in the national objectives of reduction of greenhouse gas emissions or reduction of dependence to fossil fuels (if the project is coupled with renewable energies) ensure that it can be implemented in all territories.

3.5.3 Energy and environmental plans

As part of European Union countries or seeking to join it, all countries transposed the European objectives into their own national plan:

- By combining all national plans, Albania has committed, for 4 specific indicators, goals to be reach in short/medium or long term (respectively 2020, 2025 and 2030) :
    - Target of energy efficiency reduction by 15% in 2030;
    - Increase of the share of RES by 38% - 2020 and 42% - 2030
    - Biofuels share in fuel transportation consumption: 10% in 2020
    - Reduction of GHG emissions by 11.5% in 2030.

- At a national level, Greece drafted for each European 2020 objectives a detailed road map on how to reach the binding target. Regarding the recent rule (December, 2018) for the development of a National and Climate Plan, Greece is currently preparing a draft version of the National Plan to be submitted at the end of 2019 year.

- “The National Sustainable Development strategy” till 2030 of Montenegro provides legal, economic, organizational, institutional, informational, educational, and promotional measures for its implementation. This strategy is a starting point for a European model of sustainable and strategic development of the energy sector, for the adoption of legislation and other institutional support to successful implementation of its own energy policy in the course of integration into European framework.

- Compared to the European objectives, Croatia set more ambitious goals in its "Climate and Energy Policy Framework 2020-2030" with the following targets: 40% reduction in greenhouse gas emissions compared to the levels measured in 1990. Also at least 27% of energy consumed should be generated from renewable sources and at least 27% saved in business as usual scenario. In addition, the "Energy Development Strategy of the Republic of Croatia (OG 130/2009.)" aims to build a system of balanced development of the relationship between security of energy supply, competitiveness and environmental protection, which will enable Croatian citizens and the Croatian economy to have a high quality, secure, accessible and sufficient energy supply. Such energy supply is a precondition for economic and social progress.

Complementary to the national plans, countries have drafted plans on a smaller scale that will contribute to achieving the different goals:

- In 2013 the program "The Sustainable Energy Action Plan for the City of Tirana" was the first one planning to implement in the city a number of capital energy projects, which are currently under development.

- Within the Thessaly region, 14 municipalities have committed to develop a Sustainable Energy and Climate Action Plan (SECAP) outlining the key actions they plan to undertake for climate change. Unfortunately, not all of them have proceeded to the preparation and submission of the SECAP.

- Montenegro drafted only three SEAP, one for the city of Podgorica, one for Zablijak and Kolasin. Those Action Plan focus on long-term transformation of energy systems in cities and provides measurable goals relating to reduction of energy consumption and CO2 emission. For Zablijak, it focuses particularly on the renewable potential coming especially from forest biomass, wind and solar energy. While in Kolasin foresees the development of tourism and of the community in a sustainable way be focusing on pursuing electricity generation from small hydro and wind plants, and while solar and biomass energy will be used for heat production and the increase of efficiency in heating, in street lighting and in electric equipment.

Energy and environmental plans - Key elements

Although the national objectives regard the same indicators for different values, namely to safeguard and manage energy resources in a manner which secures the smooth, uninterrupted and reliable supply of the nation's energy needs and access for all users to affordable, secure energy and ensure the viable and sustainable development of the energy sector from the stage of production to the end-use while protecting nature and safeguarding the environment, their local level of implementation differs. In fact, depending on the economic activities developed, the most energy-consuming sectors, green gas issuers or RES available are not the same. Thus, local plans make it possible to implement specific actions for each sector. (ex. In Montenegro, the RES potential is different depending on the city and specific plans have been established)

3.6 SWOT Analysis

The pilot action for the 4 territories aims at developing intermodal sea-road electromobility services linking islands and urban areas. The following SWOT analysis presents the common strengths/weaknesses/opportunities/threats of the territories regarding this type of pilot action.

4 Comparative analysis of Partners' reports regarding the Pilot 2 "Public services/measures for sharing electromobility affecting intermodal and/or interurban connections"

Today, numerous economic and social developments are at the origin of behavioural changes within the population. They are manifested in particular through a change in expectations towards mobility.

Depending on the socio-economic context of the territory, the stakes are different. However, in general, the public authorities are trying to put in place measures and offer adapted services that make their territory more attractive by meeting the population growing need for mobility.

Electric mobility represents a major challenge for the coming years and can meet several different uses depending on the targeted goals. Some territories aim to develop shared mobility and wish to offer an EVSE pilot project meeting this need. Among them are:

- **Cyprus**
- **Region of Peloponnese (Greece)**
- **Province of Ragusa (Italy)**
- **Northern Primorska (Slovenia)**
- **Catalonia (Spain)**

The following paragraphs will compare the different characteristics of these regions in order to understand, despite the differences that may exist, the common challenges of electric mobility shared by these territories.

4.1 Land use analysis of local system and their connections

The typologies of the targeted territories are very different: there is one island country (Cyprus) and selected regions of European countries (Region of Peloponnese, Catalonia, Province of Ragusa, Northern Primorska). These territories uses' and their connections are therefore completely different.

Territories structuring poles

The economic centers that structure these territories are proportional to the country activity and the territory size:

- For the Catalonia region, the Metropolis of Barcelona plays a leading role in the activity and organization of the region but also of the country: the metropolitan area occupies a strategic position in southern Europe, in the middle of the Mediterranean corridor that connects Spain with the rest of the continent. This privileged location has become the epicenter of Catalonia.

- For the Peloponnese Region, there are 5 major poles distributed throughout the territory, each having a complementary function to the others: Tripoli and Kalamata, largest city in the region, are secondary national poles of the 3rd level. Primary poles of regional importance are Nafplio, Argos, Corinth, the entrance city of Peloponnese and the largest pop concentration, Loutraki and Sparta. The city of Megalopoli can also be added regarding its important role as a national energy center.

- For the province of Ragusa, it is the main cities located on the major roads that have a key role in the territory: Ragusa, Vittoria, Modica, Comiso

- In the Slovenian region, as a center of national importance the city of Nova Gorica hosts more than 25% of the population' region and works in connection with the settlements of Solkan, Kromberk, Rožna dolina, Ajševica and Šempeter pri Gorici.

Territories spatial organization

Although the organization of these territories is different, each of them has a maritime coast more or less exploited. These geographical locations, between land and sea, and these gateways through maritime routes give them various assets from the tourist and / or economic point of view for importation / exportation.

Regarding tourism, the Catalan coast is very attractive with notably Barcelona, the Brava Coast and the Gold Coast. More generally, Catalonia has more than 22% of tourists of which almost 50% are foreigners.

The Peloponnese Region offers various touristic perspectives according to its different poles, however, as well as the Province of Ragusa, the tourist activity obviously revolves around the sea coast but also around the cultural heritage and the archaeological remains.

In determining the degree of urbanization of the Northern Primorska region, the geographical origin of the area and its accessibility are crucial. The basic rough division into the plain areas in the valleys, which are easily accessible and the hilly parts of the region (high karst plateaus), which cover its major part, provide a sufficiently telling picture of the degree of urbanization in the region. The plains of the Vipava Valley, Posočje and partly Idrijca with their settlements, where the concentration of population and jobs is highest, is also the highest degree of urbanization. Nevertheless, there are differences between the narrow mountain valleys of the Soča Valley and the lowlands of the Vipava Valley in terms of urbanization. In the rest of the hilly part of the region there is population discharging.

Apart from tourism, the economic activity of these different territories fluctuated a lot in the recent years and is beginning to experience a new stability.

Indeed, all these regions were impacted by the economic crisis between the years 2008-2013 at all levels:

- Industry
- Manufacturing
- Construction
- Services

For these reasons, today there is a real desire shared by all to have privileged relations with neighbouring countries, while still being very autonomous. This is the case for Catalonia that can take advantage of its proximity to the French mainland to develop a strong partnership.

However, the decline in the import of goods is not always easy, especially for the insular territory of Cyprus, despite the desire to emancipate gradually from massive importation.

Land use analysis of local system and their connections - Key elements

On a medium or large scale, all territories are organized around the main poles and are developed around:

- Urban areas
- Industrial areas
- Agricultural and mountainous areas
- Tourist areas

The development of these major areas in the development of a country or a region was made possible thanks to the resources that have been put in place by authorities and the revival that happened after the 2008 economic crisis.

There is a real desire to ensure mobility and consistent connections with the territory organization, and, to make full use of all the territorial assets, from the urban area to the mountainous area.

4.2 Socio-Economic Framework

The implementation of electric mobility and mobility services that will be relevant to develop depend mainly on the population and the socio-economic framework of the territory. These effectively influence the population relationship with mobility and the speed with which a new innovative service will be adopted.

As seen in the previous section, each region or country has a specific use and organization of its territory which is articulated around different poles and activity centers. This therefore impacts the population distribution and its activity, strongly influencing mobility trends.

Population dynamics

Unsurprisingly, the population is mainly concentrated around the major poles and urban centers.

In the territories of Catalonia, Peloponnese and Ragusa, these last 10 years have allowed to observe many demographic evolutions, often increasing, notably due to the immigration.

For Catalonia, the last decade bears witness to this: immigration has been and still remains a major factor in the growth of the population. Indeed, while the share of "natural" evolution of the population is between 0 and 5% per year, the one related to immigration fluctuates according to the region economic health: between 2000 and 2007, the share of immigrants in the territory increased by between +10 and + 25% / year, whereas with the economic crisis (2008-2013) it decreased from + 12% to -7%. Since 2013, which marks the end of the Spanish crisis the foreign population is once again attracted by the territory: in 2017 there was an evolution of 6% of immigrants compared to the previous year.

Similarly, the province of Ragusa is experiencing a growth in the number of permanent residents registered: around 7% in the period between 2007 and 2017. However, there are various disparities between municipalities: Municipality of Acate has increased by 38% compared to 2007, while in the Municipalities of Giarratana and Monterosso Almo the population registered a decrease of -7% and -11% respectively.

However, although overall population growth is increasing, in comparison to other Italian or Sicilian territories, the province of Ragusa is called a “weak demand area”. Especially since the population, in comparison with other Italian regions, is particularly old.

In contrast to the 2 previous cases, in the Peloponnese Region, despite a strong presence of an immigrant population (representing more than 10% of the regional population), all the regional units were concerned by a demographic decrease (-0.33% / year) between 2001 and 2011 with the greatest decrease occurring in the regional units of Arcadia and Lakonia.

It should also be noted that 59% of immigrants come from the European continent, 36% of whom come from the Member States of the European Union.

In the Northern Primorska region however, cities were affected by a reduction in the population as a whole, with a slight decrease of 2.2% in Nova Gorica over the last five years (since 2008). Only the settlement of Kromberk saw its population increase by 1.8%.

Activity and economic sectors

From an economic point of view, the evolution of the activity sectors is completely unalike from one region to another.

- Primary sector:
    - The agricultural sector represents a key pillar for the Peloponnese Region and is booming with an increase from 19,500 units in 2007 to 22,400 units in 2015 for the Province of Ragusa
    - In Catalonia, a contrast remains between highly urbanized areas and agricultural areas such as Llobregat Delta. However, it is a real desire of the region to continue to feed this sector to diversify its activities.
    - In Cyprus, agriculture only accounts for 2% of the country’s GDP

- Secondary sector :
    - Whereas in the Province of Ragusa, industry sector recorded a sharp reduction in workers between 2007 and 2015, from 23.900 to 16.000 units, Catalan industry represents 21,4% of the GVA (Gross Value Added), and the manufacturing part, 18,1% which is very encouraging because the industry has recovered weight within the Catalan GVA. In addition, the construction sector, after several difficult years to recover from the crisis, finally experienced an acceleration of activity in 2017. This sector represents 14% of the market and decreased by 3% between 2007 and 2015
    - Industry is the second most developed sector in Cyprus accounting for 12% of its GDP

- Tertiary sector :
    - In Catalonia, the services have grown at a steady pace while the Province of Ragusa recorded a decline in workers for public services and a simultaneous increase in work units for private services.
    - By means of public and private investment, the tertiary sector of the Peloponnese Region is the most dynamic in the region, accounting for 66.6% of the regional Gross Value Added (GVA). The activity has specifically developed in the tourism sector, wholesale trade and transportation.
      In addition, there is a strong desire from the territory to export more of its agricultural and manufacturing products.
      Also, the presence of Megalopolis located at the center of Peloponnese is a major force for the territory as the second electric energy producer in the country, after Ptolemaida in West Macedonia.
    - The Ragusa Province main activity is based on public services but tourism also plays its part with the promotion of several World Heritage (Unesco) sites, including Modica and Scicli. The tertiary sector grew by 76% in 2015.
    - Cyprus's economy is dominated by the service sector mainly due to tourism, finance, shipping and real estate. In total these activities represent 72% of the country's GDP.

Relevant characteristics for the development of mobility

The comparative analysis of these economic situations reflects strong differences between regions and the importance of mobility projects for inhabitants.

While the Catalonia region is recovering from the crisis and fructifies its various activities, the Province of Ragusa saw its number of people unemployed multiplied by 2.5 in 10 years between 2007 and 2017.

This may show that the economic situation in the province is not stable and that the population will certainly lose interest in the development of electric mobility. On the other hand, the electric mobility integrated in a global mobility service could be echoed by all those people who, naturally, would not have chosen for themselves the use of an electric vehicle.

Similarly, for the Peloponnese region, nearly 28% of the population lives below the poverty threshold (income lower than 60% of the national average income). Therefore, the same model will allow to reach a greatest number of citizens if there is a real service around electromobility offered.

Also, in Cyprus, a majority of apartments do not have a private parking solution. This may slow down, in the first years, the dynamic development of electric mobility but, with services adapted to the population needs, it may prove to be a driving force in the development of shared mobility services. Especially since with a cost of electricity lower than the cost of other fuels, one of the financial concerns is already lifted.

Socio-economic framework - Key elements

For territories such as the Province of Ragusa and Catalonia, with a population unevenly distributed throughout the country, and sometimes in precarious and aging situations, electric mobility can only prevail against thermal vehicles if the population is correctly accompanied. In addition, with their tourism activities, another niche opens to them on mobility services that could be widely used by tourists and people in transit on the territory.

Indeed, the strong tourist activity on the territory can represent a great asset to guarantee the use of the infrastructures and the services introduced. Especially for tourists coming from neighbouring countries where EVs is becoming more democratized.

Moreover, although it is clear that in small island territories such as Cyprus, an electric vehicle would meet the same travel needs as a thermal vehicle and at a lower cost, the development of a charging network and incentives is essential to reassure the population not equipped with a private parking solution.

4.3 Transport Framework

4.3.1 Transport supply

The offer for transport is very specific according to the development of the country and the inhabitants' travel habits:

Road transport

Territories are not equivalent in terms of road infrastructure. Indeed, for the Province of Ragusa for example, the motorway network is non-existent. Although measures are being taken such as the extension of the motorway Catania-Syracusa up to Gela town by crossing the Province coast. Today, it is a major challenge to serve the entire territory in a homogeneous way.

With the same goal of improving the road connection of its territory, the Peloponnese region has a network that tends to densify in the coming years and already has a connection to Greek mainland by the Corinth isthmus;

While the Catalonia region is already thinking ahead. Indeed, the road and motorway networks are well in place so the issues and areas for improvement are completely different. Today it is mainly about initiating and pursuing the creation of shared mobility lanes, restricted traffic areas, bike paths...

Railway transport

The rail sector is governed by the transport of goods and people. Today the main axis served in the Peloponnese region is Athens - Corinth - Patras.

In the province of Ragusa, the network has been decreasing in the last years: with only one truck in the province used mainly for tourist routes, it is unfitted for commuter displacement because of the low frequencies of the trains.

The network in the Catalonia region is completely different: trains with variable speeds make it possible to move inside and outside the region and even in neighbouring countries.

Maritime transport

All these territories in the Mediterranean basin have the privilege of being able to develop an activity around their maritime borders, this necessarily involving the development of ports (tourist and / or goods).

In the Peloponnese region, there is notably the port of Patras as well as the Katakolo port by cruise ships, and to a lesser degree by a number of smaller ports and harbours.

In the province of Ragusa, connections are also numerous with the port of Pozzallo and its importance for the daily shipping connections with Malta (goods and passengers) and Marina di Ragusa (yacht hub), Scoglitti, Donnalucata, Modica Marina for yacht using.

Air transport

One airport in Kalamata serves the Peloponnese region. Nearby points of interest also include Achaea area and Athens airport.

In the province of Ragusa, the international airport of Comiso allows to serve Malta, Milan, Brussels, London, Birmingham ...

In addition, other services exist in the different territories:

- Local Public Transport: bus companies, urban and interurban transport
- Taxis or short-term rental companies for private vehicle (without driver).
- Rental services with driver (touristic purpose only)

Regarding electric mobility, the current state of the charging services offer differs from one territory to another:

- In Cyprus, a total of 18 existing charging stations operating in mode 3 (equipped with two charging points with Type 2 socket). It is a paying service with a 25€ subscription fee for RFID badge acquisition then 5.27 € / every two months + 15.96 € for each kWh consumed
- In the Peloponnese region, there are 4 charging points of which 3 are in hotels and one a single charging point on the public domain. In addition, in the framework of EnerNETmob project, three quick recharging points will be deployed in the cities of Tripoli, Kalamata and in the Isthmus of Corinthos

- In the Catalonia region, during the first semester of 2019, there were 71 public fast charging stations. At the end of 2019, the target is a network of 100 rapid charging stations and 400 semi-rapid charging stations
- In Slovenia, there are 37 quick charging and 270 normal charging stations distributed on the territory, with a higher concentration in Ljubljana and Maribor
- Unlike other territories, in the Province of Ragusa, there are no fuels infrastructures or EVSE network installed in the local areas. Only private initiatives of sporadic EV charging points are registered in the zone without a real coordination.

4.3.2 Transport demand

The demand for transport changes over time according to the population, its activity and, above all, its means of transport.

With the Province of Ragusa, it can be seen that the demand for transport also reflects the socio-economic situation of the territory. Indeed, this somewhat precarious territory with its aging population and high unemployment rate, despite its demographic growth, has reduced the number of trips by car, bus, tram, and motorcycle. However, rail transport services and bicycles are increasingly used, reflecting a change in transport demand.

Indeed, the increase in journeys via railways shows that, for a part of the population, the distance of journeys has increased and that private vehicles are less interesting to carry them out, certainly for financial reasons among others. For the other part of the population, the daily distances have decreased making them accessible with alternative modes such as bikes or scooters.

With recent years new travel trends, we can see that the soft modes are more and more favoured with an increase in the use of bicycles for daily journeys. Thus, the province of Ragusa is no exception with the growth of the use of this means of displacement. Moreover, the metropolitan region of Barcelona has noted that the use of bicycles has doubled in 5 years between 2012 and 2017. This is especially true in large urban areas where daily commuting, home-work or home-school, can be done easily.

However, for intercity travel, the car remains the preferred means of travel. This is the case in the Peloponnese region: Tripoli, Argos, Corinthos, Sparti, and Kalamata, and the interurban network which connects these cities. To translate this trend, in the Catalonia region, nearly 1 out of 4 travellers use their personal car.

The distribution of the population has an impact on the sometimes dense transport flows that can be seen, particularly with respect to the use of private vehicles, which can be very problematic in large cities and urban areas that are points of convergence or synchronized departure according to the schedules of most workers.
The congestion of the roads encourages us to think about the reorganization of transport and new services which would guarantee an optimization of population movements and unblock these places of convergence.

Among these topics, shared electric mobility can make sense. It would ensure the punctual or regular needs of displacements by gradually orienting the population towards mutualisation behaviours of the needs and means of displacement.

Especially since the EV market has been gradually increasing in the territories automotive fleet:

- Peloponnese Region: 33 BEV (6 are electric cars and 27 electric L-vehicles) in a total fleet of 551.403 vehicles.
- Cyprus: Large national fleet of vehicles, respect of 1 charging point for 10 vehicles
- Province of Ragusa: 431 cars, 15 commercial vehicles and 7 motorcycles hybrid/electric vehicles
- Slovenia: in three years, the registrations has a 160% increase, from 133 EV in 2015 to 2123 in 2018
- Catalonia Region: between 2017 and 2018, there was a 52.2% increase in the number of EV registrations

Also, to encourage the population to adopt more environmentally friendly modes of transportation, some municipalities are putting in place exemplary measures. This is the case for the Catalonia region: 74% of the municipalities with more than 2.000 inhabitants have a fleet of bikes, whereas in the case of municipalities with more than 200.000 inhabitants, 100% of them already have their own fleet. In the city of Barcelona, apart from the well-known “bicing”, there’s a system called e-Bicibox which offers 300 electric bikes. The Municipal fleet in Barcelona City Council is made of 487 electric vehicles (all types combined), of which nearly 50% are light-duty-trucks, 10% of motorcycle and 5% of tourist-type vehicles.

Electromobility has a bright future as people are gradually moving towards alternative motorized vehicles. In the province of Ragusa, for example, we observe a decrease in purchases related to Gasoline (-40.68%) and Diesel (-5.41%) and a significant increase in sales of LPG (+ 86.20%) between 2007 and 2017. Also in Catalonia, sales of diesel vehicles decreased by -13.5% in 2018. However, the registrations of Gasoline vehicles continue to grow with + 20% in 2018 compared to 2017.

Transport framework - Key elements

The individual vehicle is the dominant mode of transport and is used mainly to establish links between the different economic and attractive poles of the territories.

The economic crisis of 2008 seems to have impacted some populations by redirecting the means of displacement and reflections in the need to purchase a new vehicle. It is therefore very appropriate to maintain these dynamics for the integration of new mobility services that the population can quickly adopt.

It also seems important to provide incentives and a legislative framework to promote market share gains for electric vehicles. Indeed, in Greece in particular, electric car use remains low because of the absence of succinct legislation and the luxury tax on electric vehicles that has significantly increased their cost.

Mobility in urban areas will be more and more influenced by two-wheeled transport, whether motorized or not, and by alternative models of historic transport. It will then be necessary to adapt all

4.4 Energy Framework

Energy is an essential aspect that must be taken into account when creating a charging network. The power generation supply is specific to the resources of each country and the willingness of public and private actors to exploit these resources.

Not all territories are equal. Indeed, a country like Cyprus, will have issues related to its insular characteristics that will not concern Slovenia for example. The energy source, the needs of consumption, of generation will not be the same.

Energy consumption

In Catalonia, the largest energy consumer is the transport sector (42.3%), followed by the industry sector (27.3%), then domestic sector (15.1%) and service sector (12.2%).

In Cyprus the total electricity sales in 2016 were of 4358.5 GWh dominated by the domestic (35%) and commercial sectors (40%).

Regarding consumption, since 2013, Greece is on a growth of energy consumed with about 54% of its energy requirements covered by petroleum products alone and almost a third dedicated to electricity. After an important decrease in 2008-2013, final energy consumption increased by 8% in the period 2014-16.

Energy origin and generation

The source of the energy consumed is specific to each country:

- In Cyprus, renewable energy contributes only to 8.5% of electricity production, the rest being based on fossil fuel production. The share of the transport sector in electricity consumption is negligible.
- Catalonia has a consumption of fossil fuels (coal, oil products and natural gas) accounted for 66.1% of final energy consumption in Catalonia (2014). More specifically, oil products accounted for nearly half of final energy consumption in Catalonia (44.4%).
- Almost 61% of Greece's primary energy needs are fulfilled through imports with the remaining 39% being covered through domestic energy sources, mainly lignite (77%) and RES (22%). Imported energy sources are mainly petroleum products that account for 44% of total energy consumption and natural gas with a share of around 17%.
- In Slovenia, the energy supply of the region is based on electricity and liquid fuels, whose consumption is increasing due to increased traffic. In the Nova Gorica part of the region, in recent years, a gas pipeline network has been built to supply natural gas. In the hill districts, solid and liquid fuels are mostly used for heating purposes. The state and the inhabitants are increasingly demanding that the construction of the hydroelectric power plant adheres to the principles of sustainable development, the nature protection conditions and the opinion of the locals.

Energy framework - Key elements

Energy issues go hand in hand with the arrival of electromobility services to ensure that the energy needed for recharging is in line with a global zero emission policy.

European, national and regional ambitions must be driving force to encourage the production of energy locally in order to limit the impact that the electric vehicle charging could have on the network.

Government incentives must allow the development of renewable energies.

4.5 Analysis of ongoing plans

Many measures have been taken to allow the development of electric mobility, which is correlated with the development of the territory.

Short-, medium- and long-term objectives should allow for the gradual penetration of services revolving around electromobility, and, territorial plans of action must be drafted in this direction.

4.5.1 Land use and regional plans

In general, territorial plans are made to:

- Define a roadmap
- Identify and anticipate major development issues.

For those reasons, Free Municipal Consortium of Ragusa approved the Provincial Spacial Plan of Ragusa which also concerns transports policies and intermodal infrastructure. It is consistent with the Regional Transport Plan (2017) at the Sicily region scale.
This consortium is the local authority coordinating 12 municipalities and can implement and act public transport policies, energy efficiency measures, territorial infrastructures and upgrading/maintenance operations on provincial road network.

Also, Catalonia edited a Plan Territorial General de Cataluña to promote and favor:

- A balanced distribution of growth in order to achieve adequate levels of income throughout the territory
- An orderly growth of the implants on the territory in order to encourage greater efficiency of economic activities and a good quality of life
- The economic growth of Catalonia and fight against unemployment

In this direction, the Peloponnese Region drafted a Regional Spatial Plan with specific objectives approved by the Minister of Environment, Physical Planning & Public Works in 2003:

- The promotion of sustainable and integrated development of the Region in accordance with its physical, economic and social peculiarities.
- The embedment of the directions of the Regional Program for Public Investments, and generally of the General and Special Regional Development Programs that have significant impact on the structure and development of the region.
- Ensuring the ability to serve as a benchmark for the coordination and harmonization of policies, programs and investment plans of the State, public organizations and businesses and local authorities of 1st and 2nd grade that have a significant impact for the cohesion and development of regional space.
- Providing guidance for Regulatory Plans and Environmental Protection Program of major residential complexes.
- Ensuring the ability to act as guidance framework for the lower levels of spatial planning (General Urban Plans, Plans for Physical Planning and Urban Organization for the Open City, Specifically Regulated Planning Areas and Zones of Urban Control) ensuring consistent management of space.
- Specializing and completing key priorities with respect to the areas in which mechanisms of Law 2742/1999 are activated, and in particular Areas of Special Spatial Interventions and Programs of Integrated Urban Interventions, as well as the Areas of Organized Development of Productive Activities.
- Defining an action plan that specialize the actions for the implementation of the Regional Spatial Plan and Plan of Sustainable Development, the measures, the budget and sources of funding of the proposed interventions, as well as the stakeholders involved and the timetable for implementation of the proposed measures and actions.

Otherwise, few regions, do not have any territorial plan and take as referential the national plans and objectives. In this present case, the National Spatial Strategy and national strategic spatial plans, inducted by the Ministry of Environment, Energy and Climate Change are applied at the regional level.

4.5.2 Mobility plans

Often in the territorial plans and more specifically in the plans dedicated to mobility, measures in favor of the integration of electromobility are approached. In particular, we find vehicle sales targets and forward-looking results of the charging point volumes to be deployed.

The Peloponnese Region shows its interest in electromobility issues through its involvement in projects to promote solutions for electric transport systems at interurban and interregional level, by implementing pilot networks of charging infrastructures and by assessing sustainable technologies to manage energy demand of electric mobility.
In the framework of the EnerNETMob project, pilot charging stations will be implemented in regional building's parking areas and more specifically in the administration offices of the Regional Units in Tripoli,

Corinth and Kalamata. These points are located in the center of these cities, approximately 10 minutes from the national road network.

These projects are in perfect harmony with the different SUMPs that are emerging, especially for Kalamata, Loutraki and Xylokastro-Evrostini, and which will target the following topics:

- Designing policies for sustainable mobility,
- Improving the quality of life in the city,
- Upgrading the urban environment by limiting pollution and noise,
- Improving public transport mobility,
- Enhancing walking and cycling, and
- Enhancing road safety.

Province of Ragusa also gives great importance to the development of electric mobility and its Sustainable Urban Mobility Plan aims to:

- Create a network of charging points;
- Create electric car sharing services;
- Create electric bike sharing services.
- The measures on electric transports established by SUMPs affect:
- Charging point for electric vehicles;
- Electric car-sharing and bike-sharing services.

Also, there is a recent approval of Guidelines for Electromobility Regional Plan of Sicily, with the following provisions:

- The infrastructure of urban and metropolitan areas must provide for a reasonable relationship
- Between residential infrastructure and those accessible to the public;
- In order to minimize the impact of public work, each recharging infrastructure ensures simultaneous
- Charging of at least two vehicles;
- In the case of new construction, be prepared to be placed in a level playing field;
- For all garages, private and public car parks and for large-scale retail distribution, shopping centers
- And cinemas, an adequate number of stalls should be set up to be set up with recharging systems.

Otherwise, the Free Municipal Consortium of Ragusa is defining an EV Supply Equipment network to promote electric transport in main urban centers as well as in weak demand area of smaller towns.

For Catalonia, authorities made the choice to create a Strategic Table for the deployment of recharging infrastructure for electric vehicles in Catalonia (TIRVEC) with 3 groups:

- Linked infrastructure
- Rapid, semi-rapid infrastructure, accessibility and payment systems
- Regulations

Simultaneously, Catalonia 2020 Transport Plan for Passengers offers the following many measures aimed at improving transport services (railways and bus networks improvement, creation of a single platform for information ...)

Some countries, such as Slovenia, have opted for incentives through grants and special loans, rising networks of electric charging stations, and so on.

4.5.3 Energy and environmental plans

To fully understand the massive arrival of electric mobility, the territories are obliged to put in place plans on the energy and environmental strategy to be adopted in the coming years.

One of the goals of these plans is to improve energy efficiency and reduce greenhouse gas emissions.

Since 2010, several municipalities of the region of Peloponnese have joined the Covenant of Mayors Initiative as signatories, committed to adopt an integrated approach to climate change mitigation and adaptation. The process was initiated several years ago and is still ongoing with new membership each year. This shows that there is a change in the interest of the authorities and that these themes are now unavoidable.

To demonstrate this interest, the Province of Ragusa has adopted a Sustainable Energy Action Plan (SEAP) aimed at obtaining CO2 emission reduction target of 23% on 2020 with baseline year on 2011. For this, a budget has been allocated per sector of mobility:

- Transport (€ 26.175.000,00euros)
- Local energy production and Renewable resources (€ 7.062.500 euros)
- Public buildings and infrastructures (€ 4.950.000 euros)
- Public Lighting (€ 2.800.000,00).

Catalonia also set goals of reduction of emissions of greenhouse gases, penetration of renewable energies and energy efficiency. Through the National Integrated Plan of Energy and Climate 2021-2030, the aims to be achieved in 2030 are:

- 21% reduction in greenhouse gas (GHG) emissions compared to 1990.
- 42% renewable on the final use of energy.
- 39.6% improvement in energy efficiency.
- 74% renewable energy in electricity generation.

And with the National agreement for the energy transition in Catalonia, a focus was made on the following 7 axes:

- Guarantee the fundamental right of access to energy
- Guarantee the energy supply of Catalonia in quantity, quality and reliability
- Achieve the highest level of energy saving and efficiency
- Achieve the maximum use of autochthonous renewable energy sources
- Encourage energy research and innovation
- Democratize energy and promote the participation of society
- Exercise the full powers within the framework of the EU

Analysis of ongoing plans - Key elements

Globally, all regions have action plans that they try to respect, be it local or national. We realize that a large number of plans are made and that reflections are conducted on the challenges of mobility today and tomorrow in order to better understand all evolutions. However, despite the definition of all these strategies, a big gap persists between the objectives and the concrete actions carried out.

These elaborate plans must really allow action to take place through measures to be taken and to be anticipated regarding facilities and energy resources that will be expected.

4.6 SWOT Analysis

The pilot action for the 5 territories aims at developing electromobility in electric freight transport solutions for local city logistic services. The following SWOT analysis presents the common strengths/weaknesses/opportunities/threats of the territories regarding this type of pilot action.

3 Comparative analysis of Partners reports regarding the Pilot 3 “Electromobility in service of urban logistics”

The organization and attractiveness of a country or region takes into account among other the logistics services that are put in place. These are proportional to the economic dynamism of the territory and the ease of travel.

Given the significant distances travelled by freight services, the question of introducing electric vehicles into these fleets is legitimate. To ensure that the primary need for delivery is met in good conditions, it is important to understand how electrical mobility can be applied to this typology of travel and how an infrastructure network can meet the specific expectations that arise.

As part of the EnernetMob project, the regions concerned by this theme are:

- Region of Catania (Italy)
- Malta
- Metropolitan Area of Lisboa (MAL)
- Department of Bouches-du-Rhône (France)

The following paragraphs will compare these different territories in order to identify shared characteristics related to logistics services and electric mobility.

3.1 Land use analysis of local system and their connections

The territories targeted in this part have a very different breakdown because of their typology but, regarding their organization around the main poles, there are shared similarities.

Territories structuring poles

The MAL and the Bouches-du-Rhône department are small-scale entities of a country. They are organized around a strong urban core that radiates and has an impact over a tens of kilometres area. These are the cities of Lisbon and Marseille respectively:

- Lisbon is a real urban and economic heart for the metropolitan area, which alone accounts for 23% of Portugal's population. From this observation, we can even consider that the whole area is a structuring pole
- Due to its geographical location, its port infrastructure has enabled the city of Marseille, and by extension its metropolis, to become a major hub regarding logistics and, more broadly, the region’s economy developed and structured around it.

The Region of Catania is divided into 3 main areas and has 2 major transit hubs:

- Area Metropolitana, the main economic center of the region with a concentration of activity on the East Coast
- Area Calatina, located in the south-west and characterized by a flat relief facilitating the development of agriculture
- Area Pedemontana, made up mainly by Etna giving all the benefits to the territory
- "Fontana Rossa" International Airport accommodating 56% total passengers of the island and 91% of the goods
- Port of Catania welcomes commercial activities, tourism, nautical construction, fishing, yachting

Territory integration with the surrounding areas and internal organization

Strong changes are to be noted in the territorial organizations. These are mainly governed by economic activity and services set up by the competent authorities. These changes and evolutions are at the origin of numerous inter and intra-territorial exchanges.

In the MAL, the population revolves around the capital and the main highways. In particular, there is fragmented urbanization with the occupation of urban areas of illegal origin, growth of dispersed building in rural areas, construction of residential areas in progressively more peripheral…This dominant presence of the population reflects the major role of producer and consumer that plays the MAL and the strong interactions it generates with neighbouring regions and countries.

The geographical position of Catania is strategic and gives it a great heterogeneity. Indeed, it allows it to multiply the economic and commercial opportunities related to cross-border cooperation and the relative trade of developing countries. The urban area is mainly concentrated around Catania and the coast.

The Bouches-du-Rhône possesses strong links with other French regions but also with the countries of North Africa. Indeed, the presence of the port of Marseille is a real gateway and exit on the French mainland. It is at the crossroads of maritime, road and rail flows. This is a real asset for the department and promotes the development of the logistics sector. Beyond the transport of goods, it also plays a major role in the transport of people and in the tourist activity which boosts the department throughout the year.

In general terms, all these territories have a strong agricultural potential, sometimes dislocated on the territory as in the Bouches-du-Rhône, which is exploited with wills to promote the local consumption but also to impose itself to a greater scale by exporting the production.

Land use analysis of local system and their connections - Key elements

The major urban centers are those towards which logistics activities of maritime, rail, air or road origin converge.

Objectively, regarding logistics, electric mobility will only be able to respond to the last segment with road transport. It will therefore be necessary to directly target areas with high urban and economic potential to offer charging services adapted to the need for performance and optimization of travel.

Moreover, regarding freight transportation, the fact that these territories are quite spread out, it must be kept in mind that it is necessary to have a good distribution of charging stations to easily reach product unloading areas

3.2 Socio-Economic Framework

A socio-economic analysis in a context of integration of electric freight transport solutions for local logistic services is interesting to understand the population predispositions in relation to electromobility and the relevance to integrate shared services for freight transport and population charging needs.

Ultimately, the main conclusions will guide the type of service to be set up to respond in priority to the need for freight.

Population distribution and evolution

The cost of living in large urban areas impacts the population lifestyle. Indeed, today we note that the trend is to leave urban centers to relocate on the periphery of the main attractive cities. This is true with the MAL which saw its population grow by 5.8% between 2001 and 2011 while over the same period the population in Lisbon decreased by -3.4%.

This change in the population distribution, oriented around the major traffic arteries, contributes to the decrease in the use of public transport modes and the increase in commuting trips between the work centers and housing areas.

Also, regarding the profile of the population residing in the MAL, it is possible to highlight:

- a phenomenon of population ageing, which evolves according to the national trend,
- a phenomenon of concentration of the country's largest pool of skilled labour,
- a confirmation by the indices that the pendulum movements in the MAL are more intense

With these phenomena and despite the gradual reorganisations around the urban poles, significant gaps persist in the population distribution. In the Bouches-du-Rhône for example, one municipality out of two counts less than 150 inhabitants/km² while its main city Marseille hosts almost 4,000 inhabitants/km².

This is the same kind of gap in the Province of Catania. The population varies a lot from Municipalities to Municipalities, ranging from the biggest one, Catania, with 293.104 inhabitants and Milo with 1055. On the whole, the inhabitants' average today counted in the province is equal to 18.600. The majority of them are located in the metropolitan area, close to the Capital, Catania, and on the slopes of the Etna Volcano.

Relevant characteristics for the development of mobility

Several criteria are interesting to predict if the population is globally ready to convert its fleet of thermal vehicles into electric vehicles. These criteria include:

- The typology of housing and the possession of parking
- The share of assets with a good standard of living.

On the periphery of the MAL, population favors individual and semi-detached houses with garage and globally, in the external borders of MAL, the concentration of basic education workers is increasing. While in the MAL heart, there are more collective houses and more intense concentration of workers with higher education.

Otherwise, the characteristics of Les Bouches-du-Rhône population present:

- 23% of 15-64-year-old are entrepreneurs, managers, craftsmen, traders and liberal professions
- Nearly 40% of households live in houses
- 1 out of 2 households own at least one car park
- 78% of households have at least one vehicle

Some indicators are favorable for the integration of the electric vehicle, even if some breaches can be identified between municipalities.

Activity and economic sectors

The Catania Region has developed an economic strategy revolving around industry, high technology and food processing. These activities are mainly in the Metropolitan Area of Catania.

Agriculture is a major economic axis: in terms of area, the province of Catania is characterized by 26% of its area dedicated to wheat and 18% to citrus. Other productions, with a high added value that goes beyond national borders, are attractive: more than 50% of firms cultivate olives for oil and around the 40% citrus grows.

Agricultural production is also very important for the department of Les Bouches-du-Rhône which lists more than 426 stakeholders in agriculture, forestry and fishing and in order to support the sector in its evolution, the department has implemented measures to develop agricultural activity:

- Agricultural subsidies target:
    - Development and modernization of the production means
    - Spatial planning and environment
    - Diversification of resources
- The Departmental Funds for the Management of Rural Areas aim to:
    - Fight against the wastelands
    - Rehabilitate non-productive natural environments

In addition, all regions are strongly attractive for tourists. Indeed, the sea coasts are well exploited for seaside tourism and mountain tourism is more and more appealing. In the MAL, tourism accounts for 19.7% of the GDP.

Socio-economic framework - Key elements

Depending on the location of the population, the characteristics are more or less favorable to electric mobility. The question of land availability is, however, to be noted.

Indeed, the relevant places for the installation of services related to electric mobility for the population are often the places with a strong urbanization or an economic concentration. However, to target electric mobility with logistics transport, it will be more interesting to aim at the off-centered attractive zones to guarantee the availability of the service and avoid its monopolization by other uses.

3.3 Transport Framework

3.3.1 Transport supply

The transport networks of the studied territories were developed so as not only to allow exchanges within the territory between the cities but also to guarantee a connection with neighbouring regions or countries.

Road transport

All the territories present a dense road network that plays a major role in the external connectivity of the territory through major transit axis (essentially highways) while allowing an internal articulation through a very important network of local roads.

The territory of Catania is connected through the motorway A19 to the city of Palermo, in the North-West of the Region, while on a local scale it hosts a dense network of state roads (Strade Statali -SSs) and internal roads (Strade Provinciali) allowing important communication nets widely used in particular by local entrepreneurs for commercial scopes, above all for agri-food transport.

The territory of the Bouches du Rhone is easily accessible thanks to its motorway infrastructures: 3 major axis connecting territory from East to West and North to South, allowing national and international links with European countries. To complete and disgorge these major axes, the vehicles can rely on the departmental network. The department and more generally the Region Sud, have developed transport infrastructures that enable the department to currently be a logistics hub at local, national, European and Mediterranean levels.

The internal road network in the MAL is all the more influenced by a strong suburban mass transit system resulting from political decisions of the last decades, leading to investment in road infrastructure. Unfortunately, the predominance of mobility patterns based on the use of individual transport (IT) has had significant impacts, especially in urban areas, both in terms of degradation of the population's quality of life, the frequent occurrence of congestion and degradation of public space by appropriation by the car, and in environmental terms with the degradation of air quality and increase of noise levels.

Railway transport

In both the MAL and the Bouches du Rhône territory, the rail network complements the existing road network both for the transport of passengers and for the transport of goods.

The department network is very well structured by regional train lines compared to the rest of the Region. Following the road network model, there are transverse lines facilitating travel to the ends of the department from the East base to the West base and vice versa and also to others cities like Lyon and Paris, and, interdepartmental flows.

The railway system of the MAL allows the connection to the north, through the North Line and the West Line, and to the south, through the North-South Axis, through the 25 de Abril Bridge, connecting to the South Line.

As an insular territory with short distance travel, Malta is the only Member State in the EU without a rail system, explaining its high motorisation rate.

Maritime transport

As the territories all share a coastal zone, they have developed a centralized maritime transport network at their port, a point of contact between land and sea activities.

The Port of Catania is located in a strategic area of the city ensuring in a few minutes the achievement of main transport network (railways station, the underground station, the airport and the main roads to reach the other villages) and hosting several activities: commercial, cruise, shipbuilding, industrial, fishing and leisure, amateur and sport.

The promotion of trade sea ways in the Mediterranean Sea for France comes from the Marseille-Fos port. Its location allows it to connect another 500 ports in 160 countries allowing merchandise transactions both in Europe but also with all the continents of the world. Not only does the port plays a significant role for the maritime sector, it also a hub for logistics being at the crossroads of other transport system (road and rail). Beyond the transport of goods, it also plays a major role in the transport of people and in the tourist activity boosting the department activity throughout the year.

For Lisboa, no information was given relatively to maritime transport but as for river transport, a network was developed: The supply of river transport in MAL is ensured by the Transtejo Group, in the Tagus estuary, and by Atlantic Ferries - Tráfego Local, Fluvial e Marítimo, S.A., in the Sado estuary (exclusive service for passengers and mixed service for passengers, light and heavy goods vehicles).

Air transport

Two territories host an airport that plays a role as a logistic hub. The international airport “Aeroporto Fontana Rossa”, located close to the city of Catania received in 2018 91% of the Sicilian region freighter and 56% of the total passengers (65% national, 35% international and less than 1% transit). On the French territory, the Marignane Airport as the second French airport for fret, receives fret from all over France (linking the department with Paris, Lille, Strasbourg, Tour, La Rochelle and many others cities). It also can be used as a gate to other countries in Europe (Germany, Spain, Greece…) but also in the world (Canada, Algeria, Senegal, Israël, Madagascar…).

EVSE supply

The four territories are already equipped with a well-developed public charging network which nevertheless offers different services: charging power, accessibility (pricing, opening hours, booking option, ...).

The Catania region hosts a network of 48 charging points located mainly in the municipality of the same name. This first initiative results from an agreement with the Italian national electricity company Enel and allows the inhabitants to access a service offering normal recharges up to 22kW and fast-charging at 50kW.

Malta currently has a network of 102 charging points which tends to increase in view of the national targets set by the European Directive of 500 charging points by 2020. The existing network covers most of the territory although the capital of Valletta on the East Coast centralizes more charging points than the West of the country where white areas remain. It was deployed by the German private operator Innogy mandated by the government and offers by station a terminal of 22kW equipped with two charging points. The operator gives the ability to book a slot at any charging station.

The charging Portuguese network was developed by its public electric utility company, EDP covering the country with 1250 charging points from 3kW up to 22kW, around 500 of which located in Lisbon. From 2016, MOBI.E, the managing entity of the Public Loading Network, began the installation of the missing Fast Charging Stations, with the opening of the so-called 'southern corridor'. This network covers the territory according to the socio-economic criteria, the capital and its neighbouring municipalities gathering the majority of the recharging points which became rarer as we move away from this area of attractiveness.

In the French department, the situation is comparable to the other territories, with a network, though made up of 411 charging points, with a heterogeneous distribution to the benefit of the two urban centers of Marseille and Aix, which account nearly 38% of recharging points while some municipalities do not host any. Nevertheless, it differs from other territories because as it does not result from a single deployment initiative but rather from multiple public or private initiatives. This network accessible to the public offers in about 95% of the cases a normal recharge (3kW-22kW). Fast charging stations are usually located in service stations or supermarket car parks.

Mobility services

Three of the territories offer complementary mobility services to existing road transport networks oriented around shared individual mobility.

For carsharing, we find services for cars but also for two-wheels: in Malta a project at the national scale was realised through the public-private venture “GoTo Malta”. The company offers 150 BEVs, strategically placed around Malta and Gozo through 450 dedicated parking spaces. In the MAL, there are 3 existing car sharing companies (with electric or thermal engine) and 3 electric two-wheels or scooters companies. In the Bouches du Rhone department, car sharing is mostly developed in Marseille through two companies one of which is 100% electric.

It can be seen that electromobility is developing simultaneously and perhaps even more favourably for this type of service: reluctance linked to vehicle autonomy is almost non-existent given the short distances travelled (generally in urban areas).

Transport networks have developed to meet the demands of the population and economic exchanges. However, this demand is changing according to the evolution in mobility patterns due to economic,

technological and social development while transportation shifts, especially in urban centers, towards ones with a lower environmental impact in order to improve the inhabitants' quality of life.

3.3.2 Transport demand

Without surprise, mobility flows are structured by the main urban and economic poles of the territories and the use of private cars remain the preferred mode.

This phenomenon is particularly true on the Maltese territory, which has a national motorisation rate well above the European average rate (in 2017, 782 against 584 for UE). In les Bouches-du-Rhône, it is especially true for home-work distance where it is used in more than 66% of the time while public transport is mostly used for school trips. Within the Metropolitan Area of Lisbon, cars represent 54% of daily commuting trips.

This leads mainly to a degradation of quality of life for citizens in urban areas: atmospheric pollution while the population transiting from employment pole to resident area generate important traffic flows resulting in the congestion of main routes.

For example, the resident, active and student population that makes commuting trips in the MAL amounts to 1.674.000 individuals. Of this set of commuting movements, 60.8% were internal to the municipalities themselves (intra-council displacements), while 39.2% had an intermunicipal nature: the MAL has approximately 160.000 cars registered in Lisbon itself but another 360.000 come across the city boundary each day.

Furthermore, for certain territories the investment rather made for road infrastructures than for infrastructure and public transport services lead to overall a smaller share of this mode of transport (around 15% in Catania) or even resulting in a decrease of public transport utilisation as it is the case for the MAL: underground demand has been decreasing by 23.3% between 2010 and 2014.

EV market evolution

The EV market evolution reflects this desire to convert the current fleet essentially thermal to a fleet incorporating more low-emission vehicles.

With a goal to put 5,000 BEVs on the road by 2020 and no more conventionally-fuelled cars in cities by 2050, the authorities must encourage the development of the sector with financial and non-financial incentives.
The introduction of EV grants in 2014 and the several demonstrator projects launched under the 2013-2020 action Plan participated in the fast evolution of the Maltan EV fleet, multiplied by 30 between 2013 and 2018, counting in 2018 926 BEV, representing 0.2% of Malta's National vehicle fleet.
In Portugal, there was an exponential increase in sales of electric vehicles in 2018, the equivalent of seven years new registrations were sold in one year, representing 95% growth compared to 2017. Therefore, in 2018 there were a total of 20 000 EV (17 000 private cars) in Portugal cumulating all sales.
In the Bouches du Rhone, EV sales have been growing strongly in recent years, representing 0.38% of the fleet of the department (including 0.31% for BEV). The sale evolution shows that we can expect a rise of electric vehicles in the next few years for householders but also for companies.

For the Sicilian territory, there is no hindsight on the market evolution rather than knowing that at the end of 2017, there were close to 500 EV in the Sicilian region (with 50% of passenger cars), representing less than 0.01% of regional fleet remaining low compared to the other territories. However, with the Province project of launching a series of tax exemption and support measures for the citizens who will choice the electric mobility to travel in the territory, there is a strong chance that it will enhance the sales.

Overall, the evolution of the market does not only regard passenger vehicles but all types of vehicles (freight transport vehicles, coaches and buses). In addition, it must be supported by a parallel evolution of charging infrastructure to ensure its sustainability and meet the needs of new users. For some territories, this issue is already understood for which projects to implement complementary charging points to the existing network are planned or being deployed.

Regarding this and in order to prepare and stimulate the moving to an electric system from citizens in the Metropolitan Area of Catania, a co-financed project (the PON Metro for Catania and the Metropolitan Area) for the installation of new electric vehicles charging points into strategic areas of the city. Moreover, other urban mobility initiatives, financed by the Sicilian Region, are currently under operation in the Municipality of Misterbianco: such as putting in operation recharging points for e-cars to strengthen the sustainability of the area. Finally, the Catania territory is also recipient of a project for the installation of recharging point for e-cars to be located in the motorway 2019, under the competence of the National authority ANAS.

In Malta, complementary to the existing charging infrastructures, another 450 charging points will be set-up by GoTo. Furthermore, government has committed to deploy 131 medium and fast 2 dual-charging pillars by 2020. Both projects will raise to 814 the number of available charging points on the island in 2020, well above the minimum set target.

In the Bouches-du-Rhone, private operators should deploy high-power charging stations in the coming year, mainly located in service stations. For its part, the MAL expects that it will be at least one charging station in each municipality on the national territory in 2019.

Transport framework - Key elements

For all territories, the transport and mobility stakes are:

- For the road sector, to gradually come out of an essentially thermal model by
  - facilitating the great expansion of EV market for all categories
  - ensure a reliable network and the strategic location of charging infrastructures
  - anticipate the energy constraints of EVSE

- To strengthen other transport networks to respond to local problems observed:
  - Levels of supply particularly low during off-peak periods, restraining the mobility needs of some population;
  - Existence of low population density areas with levels of demand that need the development of flexible transport services - guaranteeing that anyone can have access to more than two reliable transport modes
  - Weakness of the articulation between services, conditioning the consolidation of a more effective logic of network operation.

Mobility in urban areas will be more and more influenced by two-wheeled transport, whether motorized or not, and by alternative models of historic transport. It will then be necessary to adapt all transport offers to the changes that are expected in the coming years.

3.4 Energy Framework

Energy objectives

As members of the European Union, the countries in which territories are established must respect the legal obligations issued by the Kyoto Protocol and Paris Agreement. As a result, countries are expected by 2020: to cut by 20% overall GHG emissions (based on 1990 data), to increase the share of final energy consumption from renewable sources to 20% and improve energy efficiency by 20%.

These national objectives having been adapted to their regions, we find for three out of four territories studied different energetic orientations and quantified objectives: the MAL has set its owned objectives regarding all subjects but with specific interest towards energy efficiency while the French territory focuses on diversifying the energy mix in the Region in favour of renewable energies.

Indeed, one of the objectives in the Region Sud (France) is to reduce the Region's fossil energy consumption by 50% by 2050. Whereas, the Lisbon region has a major role in reducing energy external expenditure (74% decrease envisioned); reducing the energy import balance by 20% ; reducing final energy consumption by 9.8%; improving energy efficiency by 20%; reducing primary energy consumption by 6 MTep; reducing by 2.000 million annual imports of fossil fuels.

Malta has a binding national target to raise its share of renewables to 10% of its total energy consumption by 2020 and achieve 10% renewable energy penetration specifically from within the transport. In terms of energy savings, Malta needs to achieve 22% energy savings by 2020.

Energy consumption and its evolution

The consumption evolution of the territories was influenced by these objectives. Malta has already put in place actions regarding energy savings: by shutting down the Marsa Power Station and the switching to the 200MW interconnector and 215MW Gas- Fired high efficiency combined cycle gas turbine.

Although in 2018 the South Region in which the department of Bouches du Rhône is located consumed 37 TWh corresponding to 8.4% of national consumption, the development of renewables energies in the latest years made it possible to cover in 2018 34% of the Region's consumption (based on 27.1% in hydraulics - 4.2% in solar energy - 2.4% in bioenergy - 0.2% in wind) while fossil fuels accounted for the remaining 66%.

The Bouches du Rhône is not the only territory whose consumption still relies mainly on fossil fuels. The Lisbon Region, where energy consumption accounts for 26.7% of the national consumption, is characterized by a high energy dependence from abroad through fossil fuels importation. Also, in Catania, remains a predominance of oil products fuels for different sectors: sailing, air and road transport.

Energy production and evolution of renewables

To meet the targeted objectives, the energy park continues to grow and more specifically in favour of the renewable energies exploiting each territories assets.

In les Bouches-du-Rhône, the renewable energy production comes mostly from the hydraulic and photovoltaic energy. By cumulating small and large hydraulic installations, 1 278 GWh can be produced, representing 10% of regional production, ensuring hydraulic as the leading sector.

Photovoltaic energy is the second source of renewable energy production: essentially due to the photovoltaic power potential available in this area. For an equivalent plant installed throughout France, in les Bouches-du-Rhône the energy production will be greater than in most other French departments.

Apart from these sectors, the territory is also exploiting bioenergy, most of the Regional plants can be find, and wind power: wind farms produced 85 GWh in 2016. In this sector, there also as real opportunity to diversify the energy production offer in the maritime domain.

In Italy, the Sicilian Region, compared to the other regions, is still playing a leading role in the production of energy from renewable sources, especially from photovoltaic and wind power. The Province of Catania contributes with an important weight in this role (15% of regional photovoltaic production), made possible by investments for more sustainable electricity generation paths.

As for wind power generation, compared to northern and central Italy regions, Sicily presents a strong advantage, being responsible for 16% of the national wind production in 2017 and where Catania contributed to 16%.

The Lisbon region plays a small part to the national electricity production (only 4.7% and mainly based on thermal energy in cogeneration plants) compared to its consumption. However, the region presents a significant energy production potential where solar, wave, wind, forest and agricultural biomass and biogas resources open multiple opportunities for the increase of sustainable energy production contributing nonetheless to a decrease in dependence on fossil fuels.

Energy framework - Key elements

In view of the targeted goals regarding renewable energies and the potential of each of the territories, the EnertMob project could exploit the opportunities for partnerships with renewable power generation projects. Moreover, in addition to the energy objectives, coupling recharging with renewable energies presents two significant complementary advantages: by supplying vehicles with green energy, it makes it possible to further reduce greenhouse gas emissions emitted by the transport sector and to offset the excess consumption associated with recharging with the electricity production obtained.

In France, the natural assets of Bouches-du-Rhone make it indisputably favourable for the development of solar energy and more specifically by exploiting the coupling of solar production and charging

3.5 Analysis of ongoing plans

The territories involved in *Pilot 3 -City Logistic Electromobility Services, for the last mile freight transport connections in urban and rural areas* have carried out public policies that support electric mobility. The majority of them drafted orientation plans to organize their investments in the coming years and define a strategy for the adoption of electric vehicles.

The province of Catania is currently defining a Regulatory plan, which concerns the whole metropolitan area (58 municipalities) and whose ambition is mostly to strengthen the railway network. Specific actions regarding electric mobility have been defined on a regional scale and have not been translated locally yet. The province has already committed to install more charging points into strategic points of Catania though.

As for Bouches-du-Rhône, the electric mobility framework has been set in both the Regional Climate, Air, Energy plan and the sustainable urban mobility plan (SUMP) of Bouches-du-Rhône. The former sets regional goals for the reduction of pollutant emissions and greenhouse gas as well as the improvement of the share of renewables in the final energy consumption. On the other hand, Bouches-du-Rhône's SUMP focuses on the introduction of sustainable mobility to all transport modes (railway connections, cycling paths, multimodal poles…). It has also led to a financial support of 5,000€ on the purchase of a new electric car, which can be combined with national incentives.

The Metropolitan area of Lisbon has planned the development of sustainable mobility and energy through several instruments. The action plan for sustainable urban mobility has structured six strategic intervention axes, which focuses on public transport, intermodality, modernization of railway infrastructure, sharing mobility, smart mobility and logistics. The development of electric mobility enters rather the scope of the Low carbon national roadmap approved in 2019 which targets carbon neutrality by 2050.

Malta has not only adopted orientation plans but also built a whole governance to promote electric mobility in the country. The National Electromobility Platform is an inter-ministerial structure operated by Ministry for Transport, Infrastructure and Capital Projects and Transport Malta, which interacts with many private and public stakeholders, from energy providers to associations and local public authorities. The platform has defined a strategy whose role is to anticipate, facilitate and promote electric mobility. The 2020-2030 roadmap consists of about 30 measures to be implemented in the short, medium and long-terms. The priority has been given to the enforcement of new financial incentives (extension of grants to light vehicles, new fiscal rebates, green loans and subsidized interest rates) and the finalization of pilot projects, whereas the deployment of a promotional campaign and the definition of a low emission zone are expected to be launched later on, between 2020 and 2027.

Malta has also been experimenting out the last-mile delivery of goods with an electric car and plans to extend the concept to other areas. The goal is here to test delivery routes which can suit the autonomy of vehicles and identify how charging can meet the organization requirements of delivery companies. It can be noted here that the other territories have not drafted specific plans for electric last-mile freight, hence some real expectations about the implementation of EnerNETMob project.

3.6 SWOT Analysis

The pilot action for the 4 territories aims at developing electromobility in service of urban logistics. The following SWOT analysis presents the common strengths/weaknesses/opportunities/threats of the territories regarding this type of pilot action.

4 Conclusions

The EnerNETMob project is composed of territories with a different level of maturity as regards the development of electric mobility. Gathering them through a network of charging infrastructures is an opportunity to favor feedback between countries as much as a promise given to EV professional and individual car users to travel all the way around the Mediterranean Sea.

From early adopters to mass-market

A first group (France, Malta, Portugal, Slovenia, and Catalonia) has already been supporting the EV market over the past years through financial incentives and the deployment of charging infrastructures. In those countries, electric car registrations are currently growing and even though their market share is unequal, the conditions for a surge in the coming years are set. An interesting element here is that if deploying publicly accessible charging stations is crucial to convince car users to switch to electric cars, it is not a necessary condition for electric mobility to become a mass-market. A country like Portugal for instance has a ratio electric car per charging point which is below what is recommended by the European Union such as Norway. Still, the market share of electric cars in total car sales is higher than in a country like France where the charging network is denser.

It shows that one of the most important elements to develop electric mobility is an active promotion. Given the average daily distance for commuters and the increasing capacity of batteries, the main hurdles on the road to electrification are mostly the acquisition costs and psychological barriers about autonomy. Moreover, considering that the total cost of ownership of an electric vehicle is overall better than a conventional car after 6 years of use, the high acquisition cost could even be qualified as psychological. Financial incentives reply here to this issue and more or less erase the difference between electric and conventional cars.

Some territories have also combined the creation of an EV-friendly ecosystem to a more directive approach with the adoption of low emission zones. Those areas limit the access to city centers to the least polluting vehicles. Professionals are in general targeted in the first place as companies change vehicles much faster than households, which will develop the offer of second-hand vehicles for households in the next five years.

In those mature ecosystems, the main challenge is to transform an early-adopters market into mass-market. Inequalities are often to be reported, whether they are territorial (urban areas vs rural), modal (individual cars vs. public transport) or energetic (highly energy dependent countries vs autonomous countries relying on renewables). The intervention of public authorities and pilot projects are therefore necessary to support a promising but fragile market.

Building a favorable EV ecosystem

A second group of territories (Croatia and Sicily) has set the conditions for the market to develop in the coming years. A low but growing number of electric vehicles has been registered and the territories have deployed charging infrastructures sporadically, thanks to private initiatives or European funds.

The goal is here to accelerate the adoption of public policies to support electric mobility so as to create a full ecosystem of public stakeholders and companies, which will develop electric mobility locally. Defining a strategy and a governance is here is the priority to strengthen the territories' position of an "EV laboratory". In addition to a national or regional coordination, new experiments and pilot projects will build up a pole of expertise locally, which will lead to attract investments from the private sector eventually.

Sharing vehicles as a way to sustainably introduce electric cars

A third group of countries (Albania, Cyprus, Greece, and Montenegro) has not carried out yet national policies in favor of electric mobility. Electric car registrations are therefore low and the lack of charging infrastructures do not enable users to make long distance trips. For those countries, the EnerNETMob project is a way to develop pilots to test electric mobility, raise people's awareness on this technology and/or install the first charging stations.

Yet the chances of achieving electrification of transport depend in the very first place of building an effective road infrastructure which is for some countries (Albania, Montenegro) still the priority. Such investments will facilitate their European integration by creating fast connections between cities and neighboring countries and will obviously improve the quality of life of inhabitants. However important developing road infrastructures may be, it should not be done at the expense of public transport and alternative mobility. Other European examples (Portugal) showed that new road infrastructures encourage households to switch to individual mobility, increasing the motorization rate and traffic, and reducing the use of collective transport modes which may itself lead to deterring public authorities to renovate public transport infrastructures.

If not accompanied in a full mobility approach, electric cars will lead to the same consequences as conventional cars. Given that purchasing electric vehicles is still very costly due to limited offer of second-hand vehicles, developing sharing mobility would be a good opportunity to introduce low emission vehicles in a short-term perspective and control the negative consequences of an increasing number of cars.

Electrification of cars needs to be integrated in a comprehensive mobility and energy approach

Overall, this report has highlighted that the transportation sector is changing and that this will continue to happen given the environmental and energy issues associated with it. However, this evolution can only be sustainable if it combines the two trends observed in a balanced manner: the first consists in gradually abandoning the individualistic use of vehicles by developing shared mobility solutions and public transport networks (e.g. development of new transport lines to reduce disparities between territories, ensure reliable services, etc.) and the second by developing electromobility in a sustainable manner. Indeed, beyond

converting existing thermal vehicle fleets into electric fleets, electromobility can be further enhanced by a supply of clean electricity produced from decarbonated energies. However, in view of the intermittency of renewable energies, the development of sustainable electromobility can only be achieved through the evolution of electricity networks towards smart grids to allow the bidirectionality of energy flows in order to facilitate the integration of decentralized energy production and the management of consumption peaks by exploiting storage solutions.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