

Current Characteristics and Future Trends in the Field of the Green Transport from the Perspective of the Sustainable Management in the Sustainable Development

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Abstract: *The sustainable management in the field of the transport is particularly important because this sector is one of the main producers of the greenhouse gases, together with the sector of buildings and the industry. The purpose of this research is to illustrate the evolution and the positive and negative impact that sustainable transports have on the national economies in Romania, in the European Union and worldwide. Given the importance they have in different regions of the world the purpose of the research is determined by the fact that national policies, both at European Union level and at global level, must include aspects related to the green economy, both by encouraging private economic entities, as well as by a stronger state involvement, by a more efficient management. The quantitative and especially the qualitative methods aim to highlight the importance of sustainable transport for a green economy. The sustainable management it is very important, especially nowadays, when progress allow to change the vision and the economic behavior in order to increase the economic efficiency.*

Keywords: sustainable management, green transport, transport demand, combined transport, avoiding transportation, green infrastructure.

JEL Classification: A13, D18, D62, E61, F69, G18, H53, I15, L62, L71, L91, L92, O18, R41, R42

1. Introduction

Transport is a very important branch of the national economy because they are the ones that make the connection between the demand representatives and the supply representatives in all the markets, they are needed in all branches and in all economic activities.

The demand for the transport activities has a very high level at present, and in the near future it is expected to increase continuously, together with the development of all the economic activities and of the society, in general.

In terms of improving the way of carrying out the activity in the field of transport, it is not just about improvements regarding the vehicles. It is also about ensuring the access to the transport for all the social classes, as well as practicing new transport models that affect as little as possible the natural environment.

Currently, the development of transport is taking place at an accelerated rhythm, but in an unsustainable way because most vehicles are using fossil fuels and the number of vehicles is growing steadily worldwide, and especially in non-OECD countries. On the other hand, the technical and technological progress in this field, is not made at the rate at which the demand for transport increases.

It is known that, nowadays, the branch of transport is one of the three economic branches that contribute the most to the increase of greenhouse gas emissions, together with the industry and the building sector. Of all the forms of transport, the one that contributes the most to these emissions is road transport, with over 70% of the total greenhouse gas emissions from transport.

In addition to the effects that are strictly

related to the economic field, on the costs and benefits related to this activity, on the number of jobs that it contributes in the total job offer, there are also other social and even psychological problems, related to the separation of the communities, the effects of congestion and its consequences on labor productivity, as well as issues related to the health of the population or the access to certain services for certain social classes.

The improvement of the activities from this field is carried out in order to make it more sustainable. This improvement is required in all the countries worldwide, but especially in the developing ones, since, in these countries, there is a shortage of supply and transports can be created directly as green, sustainable transports.

In order to make transport more sustainable and greener, it is necessary to improve all the elements which are directly or indirectly related to this field, such as - the necessary infrastructure, the vehicles, the transport models which will be applied, the telecommunications technologies, the creation of smart transport systems, the type of fuels, the type of all other materials.

Among the positive effects that result from the transition of the field of transport to a sustainable transport are both direct economic effects and non-economic effects. Among the economic effects, the most important are: the increase of the profit for the companies in the field, the creation of new jobs, both in transport and in the related activities, the increase of the value of the regional economies, the transition to the green cities - the sustainable transport being one of the essential elements of a green city.

In order to achieve these goals, it is necessary that the State develop appropriate

regulations in this area, to plan the activities and to inform the economic subjects about the benefits that, in the long term, the sustainable transport offers, about its importance. Regulations may also include setting standards or restricting certain types of vehicles, and one of the most important measures is the provision by the State of economic incentives, in the long term to private economic subjects, as well as the collaboration of the public sector with the private sector, respectively. with the informal one. The reforms in the field of financing must take into account all transport sectors at all levels, both locally, nationally and internationally. The State must orient resources from unsustainable to sustainable transport.

At the European Union level, transport policy has been addressed since the Treaty of Rome, which aimed to open the markets, in order to ensure a fair competition, as well as to ensure sustainable mobility, which means to a more efficient mobility in terms of cost, but also a traffic control. Subsequently, in 1985, the White Paper on Transport was elaborated, followed by other similar documents issued later.

In 2008, the European Commission developed a package of measures for greening the transport, and in 2013, there was published a report named "Together for competitive urban mobilization", by which it was desired to implement the sustainable urban mobility.

Until now, in the European Union, in the XXI century, more progress has been made in the field of the sustainable transport. The safety of air, maritime and road transport has been increased, a more comfortable working program has been developed for those who are working in this field,

many possibilities for transport for all types of passengers and freight have been created, technological progress has been introduced, aiming to have a greener transport, more environmentally friendly, the level of pollution has been reduced.

Regarding the development of the transport branch in Romania, in the different national strategies targeting the different sub-sectors of transport, it is envisaged to adopt different types of measures in order to reorganize the activity according to the directives of the European Union, to establish a strategy of optimizing costs and increasing efficiency, to promote a most appropriate types of transport for both goods and passengers, to reduce the risks and to optimize the transport models.

2. Literature Review

According to Wikipedia, the sustainable transport is defined in several ways, the most representative being:

“● Allows the basic access and development needs of individuals, companies and society to be met safely and in a manner consistent with human and ecosystems health, and promotes equity within and between successive generations.

●Is affordable, operates fairly and efficiently, offers a choice of transport mode, and supports a competitive economy, as well as balanced regional development.

●Limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and uses non-renewable resources at or below the rates of development of renewable substitutes, while minimizing the impact on the use of land and the generation of noise.” [4]

The current state of transport is significantly different from the characteristics of sustainable transport. A clear element is that, at present, this sector consumes a very large amount of fossil fuels and it is responsible for a large part of the greenhouse gas emissions. „Statistics learn that over 90% of all road transportation relies on oil. This figure almost goes hand-in-hand with the total global oil consumption, which stands at 60%. All these scenarios have caught the eyes of most governments and policies are being formulated to reverse this worrying trend of air pollution” [5]

The transition to the green, sustainable transport is the one that determines the reduction of the negative effects which it has on the environment and on the individuals. An important contribution is changing the management, at all levels, both in terms of private companies and the State. „Green transportation revolves around efficient and effective use of resources, modification of the transport structure and making healthier travel choices. For this to bear any fruit, it requires dedicated public awareness and participation, management of privately owned vehicles and innovation and production of vehicles that utilize renewable sources of energy such as wind, solar, biofuels and hydroelectricity.” [5]

The transition to the sustainable transport has a great number of benefits. „Linked together, these strategically planned networks of green elements are able to provide multiple benefits in the form of supporting a green economy, improving quality of life, protecting biodiversity and enhancing the ability of ecosystems to deliver services such as disaster risk reduction, water purification, air quality, space for recreation and climate

change mitigation and adaption.” [6]

„Rethinking the transport system is an integral part of raising the energy efficiency, and improving energy conservation and environmentally sustainable production. It is no longer enough to have the ambition of reducing emissions or increasing energy efficiency and better fuel consumption of vehicles. The use of biofuels it is not sustainable in the long term: even the aim of electrification does not go far enough. Much more can be done by changing the way people move: more efficient public transport systems, turning city streets biker friendly, faster trains, and hibryd or electric cars are the key areas.” [2]

Measures that can be taken locally or globally are particularly important, and the strategies used by managers need to consider these goals. „Sustainable mobility can only be achieved through a fundamental paradigm shift at both local and global levels. We need to develop our thinking around integrated systems. We need to approach mobility as a service. Sustainable mobility it is not separate from logistics. It is about the transfer of people but also about the transfer of goods.” [2]

The European Union has been noted for its achievements in recent years in this area. „The EU is investing over €117 million in 39 key transport projects that will help build missing connections across the continent, while focusing on sustainable transport modes. The projects will reduce the noise generated by freight trains, develop and improve cross-border railway links and upgrade crucial infrastructure in ports. They will be supported through the Connecting Europe Facility (CEF), the EU’s financial mechanism supporting transport infrastructure.” [7]

In order to encourage the member States to continue the transition to the sustainable transport, the European Union has refined its financing methods, allocating larger amounts for this purpose. "In June 2018, the European Commission, as part of proposals for the next long-term budget (2021-2027), proposed adapting the CEF programme to support investment in Europe's transport, energy and digital infrastructure networks. A provisional agreement was reached by co-legislators in March 2019. Certain provisions, such as budget, remain open pending decisions on the EU's overall long-term budget.

The Council text and European Parliament text both list the following priorities for the transport sector:

- Advance work on the European transport network, while helping the EU transition towards connected, sustainable, inclusive, safe and secure mobility.

- Decarbonise transport, e.g. by creating a European network of charging infrastructure for alternative fuels and by prioritising environmentally friendly transport modes.

- Invest in transport projects offering high added-value in cohesion countries, through a dedicated budget.

- In the context of the Action Plan on Military Mobility: adapt sections of the transport network for civilian-military dual-use (for instance technical requirements on dimensions and capacity), using a dedicated budget." [7]

The regulations which were developed in the field of the transport in the European Union, sustain the transition to the green transport. "To support the states member of the European Union in developing the trans-European transport network (TEN-T network), the European Union adopted a

regulation in 2013, which provided Union-level guidelines for investments in the field of transport (TEN-T guidelines). The regulation imposes a binding legal obligation on European Union member States to develop the so-called "central" and "global" TEN-T networks. In addition, the Regulation identifies projects of common interest and specifies the requirements to be met when implementing these projects. The Regulation on the Europe Interconnection Mechanism (MIE)8, adopted in 2013, allocated a budget of EUR 30.4 billion over a seven-year period (2014-2020), of which the amount of EUR 24 billion is foreseen for the transport sector." [8]

In Romania, a series of measures for transforming transport into sustainable transport have been adopted, which include specific sets of measures for each sub-sector and which seek to align with the provisions of the European Union. "The Master Plan for Transport in Romania 2030 mentions the need to respect conservation measures in future projects including integrating non-structural and Green Infrastructure measures, and avoiding negative impacts on protected areas, forested areas and non-protected areas where species of community interest are identified, by reconsidering planning of routes. The Territorial Development Strategy of Romania 2035 clearly refers to Green Infrastructure as an efficient way to adapt to climate change and to diminish natural risks compared to physical or grey infrastructure. Specific measures include protecting natural habitats (by ensuring diversity of and interconnectivity between natural areas, particularly in the context of Natural 2000 management) and developing green spaces in urban areas and green belts around major cities." [11]

3. Characteristics of the existing transport sector

At the level of the European Union, the importance of the policies in the field of transport was emphasized since the beginning, in the Treaty of Rome, with the aim of creating a common market for the transport and of ensuring the freedom of the movement of services.

In the process of opening the markets and in order to achieve the sustainable mobility, the main objective was to ensure fairness in terms of competition, for each type of transport separately and between different types of transport. The process of opening and liberalizing the markets had a number of beneficial effects - changing the production and the storage methods, increasing the volume of transported goods, increasing the number of passengers, and lowering the transport prices.

At the level of the European Union, since 1985, several documents called the "White Paper" have been elaborated, in which a series of provisions regarding the field of transport have been determined. In 1985, among the most important provisions from the point of view of greening the transport sector are: the simplification of the controls and of the formalities, which streamlines the traffic, the development of the structure of community interest, in order to increase the degree of connectivity between different countries, regions and areas and the increase of the security of transport activities. In the White Paper of 1992, the provisions are similar, but, in addition, it is added, as objective, the social harmonization.

As important provisions of the documents from the end of the XXth century, are

also included: to achieve fair tariffs for the use of the infrastructure at European level and the extension of transport to the eastern part of Europe, because significant increases in traffic were expected.

In the first decade of the XXIst century, the GALILEO satellite radio navigation system, the management system of the railway traffic ERTMS (European Railway Traffic Management System) and the program for the modernization of the structure for the air traffic management, SESAR (Single European Sky ATM Research) were launched in the European Union.

GALILEO is a European satellite navigation and positioning system, consisting of 30 satellites, similar to the American GPS system, which is intended for civilian use in the countries of the European Union.

ERTMS is a European system of traffic management and speed control that aims to increase the degree of connection and interoperability in the railway transport system, under maximum safety conditions. It is efficient only for trains running at over 120 km / h.

SESAR aims to improve the traffic management so that air transport becomes more environmentally friendly and to reduce the pollution caused by airplanes and airports activities.

In the White Paper from 2011, entitled "Roadmap for a single European transport space - Towards a competitive and resource efficient transport system", it is underlined the importance of reducing the greenhouse gas emissions, together with the development of the transport sector and with the increase of the mobility's degree. There were provided: reducing the energy consumption, using a cleaner energy, a better exploitation

of the modern infrastructures, reducing the impact of the transport on the environment. The concrete objectives are:

- diverting the freight from road transport to the railway transport and to the maritime transport by 30% until 2030 and by 50% until 2050

- tripling the length of the current high-speed network by 2030 and transferring the majority of passengers on medium distances to the railway transport until 2050

- implementing the TEN-T multimodal basic network until 2030

- reducing greenhouse gas emissions by 20% until 2030 and by 60% until 2050, compared to 1990

- using in a proportion of 40% the low carbon fuels in aviation and urban transport

- innovation.

In December 2013, the executive communication - "Together for a competitive urban mobility" was published.

In December 2015, the European Parliament adopted a resolution on sustainable urban mobility, according to which city development plans should include objectives regarding the implementation of low emission transport modes, the use of alternative fuel vehicles, the creation of the intelligent transport systems, paying more attention to people with reduced mobility, the adoption of some economic policy measures in the field of parking and the reduction of the traffic noise.

The significant growth that has been achieved worldwide in the last years in this sector is explained by the close relationship between the transport sector and the economic growth. The supply of goods and services, the production are strictly related to the transport of goods, and the demand for

products, the consumption are related to the transport of passengers. The continuous increase in transport demand, both for passenger and for freight transport, is a factor that has determined the development of this sector at an high rate, even if this development is, currently, mainly unsustainable. It is estimated that, by the middle of the XXIst century, the demand for transport will double compared to the level it had at the beginning of this century. In order to satisfy this growing demand, most countries of the world continue to expand the transport based on traditional, motorized, fossil fuel-powered vehicles, because they are easier to achieve and, for them, there exist already high-performance technologies.

The increase in the transport demand, related to the development of the economic activities in general, will determine, by the middle of this century, the increase of the number of vehicles by three - four times compared to the present number. These increases will occur in all the countries of the world and, most notably, in the developing countries.

Through the total consumption of the transport sector, some resources are almost exhausted, the lands on which this activity is carried out are degraded, reaching, in many situations, losses in biodiversity, through the negative effects on the vegetation and on the animals. The resource consumption is made both for the production of the means of transport itself and for the necessary infrastructure, the most important resources used for these activities being the metals and the cement. Another category of consumption is that which involves the use and the maintenance of the vehicles in operation, among the most important resources used for these

activities being the fossil fuels (transport consumes more than a half of the total liquid fuels and represents the most important sector which increases oil consumption) and rubber. Plastic is also a widely consumed resource in most transport activities.

The way in which the transport sector is currently developing produces many costs, both economic and extra-economic, such as social and environmental costs. An element that determines high extra-economic costs is the emission of the greenhouse gases, which, besides being harmful to the environment and individuals, also results from a high energy consumption activity. In addition to the danger that transports pose by the harmful substances emitted into the atmosphere, the dangers for individuals also include the safety of the population regarding accidents. In this regard, the state must pay a greater attention to the verification of the vehicles and of the infrastructure if we look at the issue from a strictly technical point of view, and, regarding the population, the drivers, a special role is played by the education regarding the control of speed and the alcohol consumption.

One of the consequences of the spectacular growth of the number of vehicles is the congestion, which has, as important economic effect, the reduction of the productivity, especially in the urban environment because the time used for the transport is very high, which can cause negative effects on the individuals work capacity. As an extra-economic effect, the congestion reduces the degree of accessibility in some urban areas and can, in the long term, reach the separation of the communities. Apart from the negative social and psychological effects, the congestion leads to increase of the transport time, which

implies a greater fuel consumption and thus contributes to the increase of the pollution degree. Air pollution, noise and vibration affect the health of the population.

In order to avoid the congestion and to improve the traffic flow, it is important to improve the way that the infrastructure is used, so to create special lanes for buses and bicycles. They have to be introduced the intelligent transport systems, the green logistics, which correlate the need for transport with the demand. The logistics is the one that translates the demand for goods and services into the transport demand, so it makes the connection between the production system and the transport system.

At the European and the global level, it is necessary to improve the elements of planning and of logistics management. For example, at the level of the European Union, until 2050, the volume of road freight is expected to increase by about 80%. As ways to improve the logistics we can list: to make sure that the vehicles which are transporting goods are full and to use some vehicles that based on the renewable energy sources, such as solar energy.

Regarding the effect of the development of this sector on the number of jobs, in the European Union about 11 million people worked in the field of transport in 2015, but the employed population structure was very unequally distributed by sex, because only 20% were women. The low share of women was explained by:

“●the lack of an adequate balance between professional and personal life in shift work

●failure to adapt the workplace and equipment (for example, lack of sanitary facilities for women, unavailability of protective clothing for women);

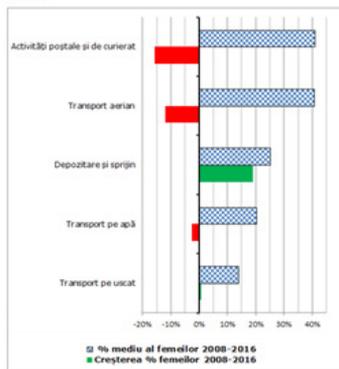
- insufficient specific recruitment of women in a sector that has the reputation of being dominated by men

- lack of training and lifelong learning opportunities.

The European transport sector offers” [8]

Chart 1: Weight and growth of the employment rate for women in the transport sector in UE-28 (2008-2016)

Figura 1: Ponderea și creșterea ratei de ocupare a forței de muncă în rândul femeilor în sectorul transporturilor în UE-28¹¹ (2008-2016)



SURSA: ANCHETA PRIVIND FORȚA DE MUNCĂ, EUROSTAT.

Source:

https://ec.europa.eu/info/sites/info/files/file_import/european-semester_thematic-factsheet_transport_ro.pdf

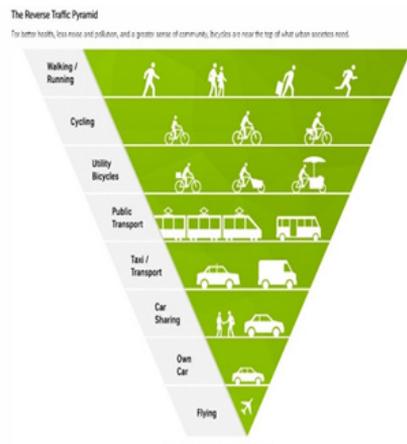
If the transport will continue to develop as it did until now, the number of vehicles will increase three – four times until 2050, producing an increase of the number of passengers and of the volume of freight. The transport of passengers is expected to significantly grow in all its forms, except the road transport by bus, and the volume of the goods will be reoriented, from the transport on the railways to the road transport. The consumption of energy will increase, the most of it being caused by the road transport followed by air transport. The number of jobs

will also increase.

At present, within the financing of the transport sector, there are some generally valid trends worldwide - the predominance of the public sector in the financing of the infrastructure, the fact that governments and international financiers prefer to invest more in the road transport, the financing of green transport is relatively limited and, in addition, many of the services are provided by the private and informal sectors.

4. Perspectives, modalities and consequences of greening the transport sector

The transition to the green, sustainable transport, produce a number of positive outcomes for both for those who provide this services and for those who benefit from this services, both for private businesses, and for the State. The transition to the green, transport is relatively slow, and the biggest possibilities are in the developing countries because they do not have to change some existing forms and models, but they have to provide the transport directly in a green, sustainable way.



Source: <http://www.urban-hub.com/urbanization/reinventing-the-wheel-or-the-future-of-urban-biking/>

As in any other type of activity, the technical progress is an essential element for making the transition to the sustainable transport, aiming to keep in operation only the efficient technologies and to withdraw the inefficient ones.

In addition to this measure, there are other measures that have a special role and that are specific to this sector. This category includes the promotion of public transport, cycling and walking, so that the least polluting means of transport are used.

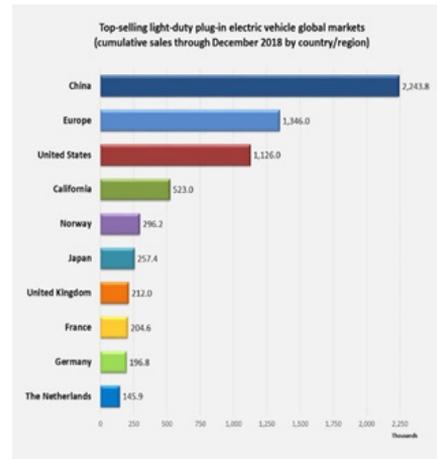
Walking, on relatively short distances, reduces the greenhouse gas emissions to zero and, moreover, contributes to maintaining the population's health.

A relatively easy measure to put into practice is to use simple bicycles, which are particularly advantageous and can afford a much larger number of citizens or to use the electric bicycles. Regarding the electric bicycles, in some states it is necessary for people who want to buy and use such a bicycle to obtain a permit attesting their ability to use them.

Because the use of electric means of transport is an important step for the transition to the sustainable transport, the local authorities, due to their administrative autonomy and to their ability to sign partnerships with private economic entities, can play a very important role in deciding to increase the number of charging points on the route and to adapt the offer to the requirements of consumers of these services. For electric scooters and bicycles, the lack of public recharging infrastructures is not a very serious problem because they have portable batteries that can be recharged into the internal electricity grid. In order to increase the number of these means of transport, the state could

increase the financing in this field. One of the most successful countries in the field of electric mobility is the Netherlands, which already has a mature market.

Chart 3: Top-selling light-duty electric vehicle global markets (cumulative sales through December 2018 by country/region)



Source:

[https://en.wikipedia.org/wiki/](https://en.wikipedia.org/wiki/Electric_car_use_by_country)

Electric_car_use_by_country

The use of the electric motorcycles or automobiles, as well as hybrid vehicles, including hybrid buses (the best-known example being the Mercedes-Benz Ciatro G BlueTec Hybrid Bus) also means reducing the greenhouse gas emissions during transportation, but it involves emissions in battery charging processes. The accessibility to these means of transport is lower because, at the moment, they have quite high prices. The use of their hybrid vehicles reduces by 90% the greenhouse gas emissions that harm the health. An effective alternative in this regard would be the widespread introduction of vehicles that operate on fossil fuels.

Another measure is to increase the occupancy's degree of the vehicles, so that a

vehicle transports more people, even up to 5 in a car, thereby reducing the number of vehicles in circulation.

Improving the way the vehicles are driven is a sustainable measure both from the perspective of a green driving way from a technical point of view and of reducing the consumption, but also from the perspective of avoiding negative events.

The transition to new forms of sustainable, green transport refers to similar elements in the field of rail transport, namely the use of green trains, which means hybrid locomotives and innovative technologies. The electric trains, although they involve certain emissions related to the electricity, can be considered green because they can reach a much higher transport speed and are considered to be safer.

Avoiding transport, which means reducing the demand for transport, the number of passengers and the quantity of goods transported, implies, first of all, the existence of green cities, which have a more compact structure, so that the population is closer to the jobs, but also to the places where they purchase their consumer goods and to the places where they carry out different cultural or relaxation activities. Thus, the total transport demand is reduced.

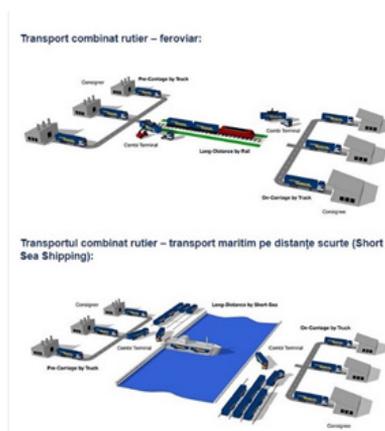
Avoiding the transportation can also mean replacing the need for transportation to workplaces by holding teleconferences or finding ways to perform work from home or from an office that is placed in a nearby area of the neighborhood, without having to travel to a center.

One of the methods of greening the transport branch is to practice the combined transport, that means to combine the forms of road transport with the rail and naval

ones, so that the costs are minimized and the efficiency of the transport is maximized. It is preferable that road transport is used as far as possible only for short distances, for the delivery or collection of goods. The combined transport methods are efficient because, with their help, the congestion can be avoided, as far as possible, the optimal vehicle loading capacities are used, the most modern means of transport available for each type of transport can be used. Thus, a greater transport flexibility results and environmental and social conditions improve.

In order to achieve these combinations optimally, it is necessary to have a network of advantageous and fast connections. The use of the most modern means of transport and the practice of the optimum loading, specific to each means of transport, is a measure that also favors the increase of the safety in the traffic.

Chart 4: Combined transport: road transport and rail transport; road transport and naval transport



Source:

<http://www.lkw-walter.ro/ro/client/trafic-combinat/transportul-combinat-functioneaza-in-felul-urmator>

The development of the sustainable transport activity is an important factor that

determines the increase of the number of jobs. The new jobs are created both directly, within the provision of the transport services themselves and indirectly, in the related activities, such as the activities related to the production of the used vehicles, to the maintenance of the infrastructure, to the refining of the fuels, to the recycling of the materials.

The development of the transport is a condition of the economic development of all regions and areas of the countries. Thus, the social-economic disparities are minimized, the health of the population is improved, a healthier lifestyle can be practiced and, finally, the quality of life increases.

The fact that the development of transport determines the development of all regions of a country can be illustrated by the effects that it has on the rural environment. The effects are multiple and determine the improvement of the social and economic conditions. Transports are the ones that allow to increase the quantity of agricultural products sold in more distant markets, without affect these products by the impossibility of a longer term storage. Due to the increase of sales of agricultural products, the incomes of the rural population increase, the poverty level is reduced and the expansion of the banking sector is boosted, both by increasing deposits and by contracting more loans, in larger amounts, requested by the rural community. Transport also facilitates the movement of the rural pollution to the jobs in other localities and of the children to the schools.

Apart from the stimulating effect of the local economy, the development of transport determines, by increasing the transported volume of goods and number of passengers, the reduction of unit costs of the transport and also the reduction of the time used for

transport. These elements represent prerequisites for lowering the sales prices of the products, making them more tempting for buyers. Thus, as an indirect consequence, it results the increase in the demand and in the external exchanges.

Regarding the investments that will be made for the transition to the green, sustainable transport, the aim is to to increase the efficiency of road vehicles, to expand the infrastructure of public transport, to increase the energy efficiency and to reduce by a quarter the transport through avoidance strategies, based on changing of the behavior of the economic entities regarding the transport activity through changes related primarily to doing more e-work, to the cities planning, to the adoption of some new regulations. Attention will also be paid to the type of materials used in the construction of the infrastructure and of the vehicles by choosing some more qualitative and easier materials, to the construction of trains that will slip more slowly on the rails, to increase the efficiency of the means of transport by improving their design. Non-motorized transport will be encouraged, reducing oil consumption and energy consumption. The number of jobs will increase more than until now, mainly due to the increase in the number of jobs in public transport. The regulations should consider reducing and controlling the level of the greenhouse gas emissions, saving fuel and their quality, doing the technical inspection of vehicles, increasing their occupancy or discouraging their use, especially for the motorized ones.

In order to improve the way the transport process unfolds, it is essential to use the digital skills and computing so that transport can be carried out faster and in a manner

more suited to the requirements, to improve both the transport activity itself and the relationship with other economic entities who benefit from these services. Drivers are better informed, they can practice the green driving, which is more secure, the flexibility of transport increases, the necessary connections can be made better and easier, and the transport can be more personalized according to the specific needs of the clients. In addition, digital monitoring provides more complete and complex information about the way of carrying out the transport activity, creating the premises for its analysis, evaluation and improvement.

It is also important to inform and to aware the population about the new modes of transport, about the new behavioral model that they must adopt in relation to the transport, which will cause important changes in the transport demand. This includes both awareness campaigns and the education of the children at schools.

The awareness of the population can also be achieved by organizing public events, such as, for example, in Romania, "I Velo Relax da startul la pedalat!" (I Velo Relax start to pedal!), organized by the Green Revolution Association for 10 years in the cities of Bucharest, Constanta, Brasov, Sibiu, Alba Iulia, Oradea and Iași, in order to promote and raise awareness about cycling. In 2018, Scania organized, in Sweden, the "Sustainable Transport" forum, which defines the target for the year 2050 - that there should be no transport based on fossil fuels. In Italy, there are many projects that have the aim to ensure a better answer at the increasing of the connectivity's degree which was discussed within TEN-T. Another example was the BMW group which, over the last 20 years,

has managed to reduce the greenhouse gases emissions of the fleet of cars by about 40%.

An interesting element is the combination of the transport infrastructure with the green infrastructure, which involves the creation of a network of spaces that incorporate some green elements in the territory, which will help to conserve biodiversity, to reduce the carbon dioxide in the atmosphere, to increase the quality of the air and of the water, to reduce pollution in general and to better use of the land, to reduce the environmental risks. The green infrastructure may include the blue infrastructure, when it is possible to use also aquatic resources in the respective territory. Due to the economic, social and ecological benefits it brings in the European Union countries, it is desired to create a green infrastructure at all levels - national, regional and local, both in urban and rural areas. In order to achieve this goal, it is necessary to adapt the national economic policies to the new objectives or even to find innovative policies in this field, which should also include the field of transport. The funding systems for the green infrastructure are the European Regional Development Fund (ERDF), the European Social Fund (ESF), the Cohesion Fund (CF), the European Maritime and Fisheries Fund (EMFF), the European Agricultural Fund for Rural Development (EAFRD), LIFE+ and Horizon 2020 project funds and the Natural Capital Financing Facility (NCFF) of the European Investment Bank (EIB)."

The transports could be helped by the green infrastructure by improving its design, by building green viaducts and bridges, by building eco-tunnels, which would allow the reduction of the time for transport, together with a better use of the land and with the

possibility of not diverting water courses. Thus, the tourist activities will be affected to a minimum and, possibly, the demand for tourism in those areas will increase as well as the amounts paid as rents. The vegetation will also contribute to the reduction of the noise.

It has been observed that the permeable sidewalks, as elements of green infrastructure, are more efficient and much cheaper than traditional ones. They retain rainwater and are expected to have a lifespan of about 25 years.

A good example of green infrastructure is the Alpine Carpathian Corridor in Austria and Slovakia, which has sought to preserve the habitat of some wild animals. To ease the traffic, bridges and highways were built in the areas of interest.

The changes in the field of transport's financing are also essential in order to orient them towards a green, sustainable transport. The financing modalities must be efficient and stable in the long term, adapted so that all transport sectors benefit equally, to ensure horizontal and vertical equity, and a greater part of the resources allocated to unsustainable transport must be reoriented to the green ones, together with finding new sources and financing methods for the latter. The sources of public funding used locally, nationally and even internationally must be combined with the provision of incentives to the private sector, including through public-private partnerships. The transport sector must be easily measured by appropriate indicators, developed by managers, in order to be properly evaluated and improved.

The state plays an important role in the management of this transition process. It must seek to improve administrative

capacity, in order to more easily and effectively implement the economic policies regarding the green transport and the corresponding financing mechanisms. The state needs to find new ways to make the population aware of the importance of changing the transport models so that they are more environmentally friendly. The state must monitor the transport process and must analyze the data relating to it, so that it can plan it in accordance with the requirements of the green economy.

In connection with the international regulations in the field, Incoterms (International Commercial Terms) is of particular importance, which represents certain standardized international commercial terms, designed and published by the International Chamber of Commerce. The parties of a commercial transaction may express their grievances regarding a clause in these Incoterms and agree, with one consent, upon them. These regulations refer to the essential obligations of the seller and the buyer and, in connection with the transport of goods, the transfer of risks and the costs of delivery.

Some of the concrete initiatives that have been undertaken worldwide are:

“●In March 2016, the Netherlands' parliament voted to support a motion stating it wants only sustainable, zero-emission vehicles to be sold on the Dutch market from 2025. If the parliamentarians have their way, no new diesel or petrol cars will enter the Dutch market from that point forward.

●In May 2016, The California Air Resources Board announced it will fund the deployment of the largest number of zero-emission trucks servicing ports in the history of the nation. These zero emission big rigs that transport shipping containers will be

used in and around California's seaports.

- The 2015 annual technical report published by the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) defines the state of fuel cell electric bus technology to be ready for commercial deployment.

- Tangshan Railway Vehicle Company (TRC), the first locomotive and rolling stock manufacturer in China, is investing in the development of a new fuel cell module, designed to meet the requirements of tram or ground transport vehicle applications.

- In Europe, funding has been made available to support for the simultaneous deployment and demonstration of a set of fuel cell bus fleets with at least 100 FC buses consisting of at least 3 locations with minimum 20 buses per depot.

- In March 2016, South Korea announced plans to deploy thousands of hydrogen fuel cell buses at a rate of about 2,000 vehicles per year. These zero-emission buses will replace the compressed natural gas buses currently in use across South Korea." [9]

It can be considered that the most important progresses of the European Union in the transport sector over the last 20 years are:

- safer air, sea and road transport
- a reasonable work schedule for those working in the transport sector
- more transport possibilities for passengers and businesses
- less pollution
- technological advances towards greener transport." [10]

One of the most serious problems in the transport sector remains the traffic congestion, especially for the road and air traffic. For this reason, the European Union loses about 1% of GDP annually and generates very high

carbon and other undesirable substances.

"Transport needs to be streamlined. In this sense, in addition to improving logistics and promoting "smarter" behavior by travelers, it is also necessary to optimize the use of modern information and communications technologies and those based on satellites. Instead of being limited to a single mean of transport, the European traveler must learn to combine all modes and networks. Thus, their use and capacity will improve significantly." [10]

Other important objectives that can be mentioned are

- Develop common European standards on transport safety and security; strengthening Europe's role and influence in international transport.

- Continue the works in order to finalize the project "The Single European Sky" and to conclude the negotiations regarding the fourth railway package.

- Collaborate with the main companies in this sector within public-private partnerships such as SESAR and "Shift 2 Rail" in order to introduce, on the aviation and railway markets, the innovations for both citizens and enterprises." [10]

Regarding the development of the railway transport in Romania, in the national strategy for the railway transport, it is foreseen to adopt measures in order to reorganize the activity of the railway companies according to the European Union directives, to establish a strategy of optimizing the costs and increasing the efficiency, to promote the rail transport for both goods and passengers, to eliminate the dangerous points and the speed restrictions on the public infrastructure, to create partnerships to manage the auxiliary assets, to introduce the telecommunications

on optic fiber support, to mechanize the railways and to provide the various necessary IT services.

In the field of the road transport, the measures are foreseen for the intercorrelation and interoperability of the road network in our country with the network in the European Union, the correlation of the development of the public network with the priorities of the economic development of the country and the improvement of the quality.

In naval transport, the aim is to give a greater importance to the competitive advantage offered by the Danube River, to develop the operating and storage capacities in the ports on the Danube, to increase the freight traffic in transit through the ports, to develop the cruise tourism on the Danube, to modernize and develop the fleet and to stimulate the private initiative.

In the field of the air transport, the aim is to achieve a greater safety and security of the transport, to consider more the interest of the users, to adopt new regulations that correspond to the new wishes and to develop policies that involve the consultation of all the interested user categories.

As examples of good practices in Romania, they can be mentioned:

• "Corridors for wildlife and sustainable resources in Maramures County"; "The benefits from the project include: • Identification of critical habitats and movement corridors for bears; • Identification and implementation of tools to effectively manage natural resources that contribute to the conservation of the critical habitats and corridors for bears; • Identification of management measures for conserving bears and their habitats and for sustainable development of the communities; • Implementation of 22 joint

planning activities involving key stakeholders; • Enhanced capacity of protected areas staff: seven training sessions organised for local authorities / decision makers and forest management units' representatives; • Development of information materials for disseminating toolkits among the local stakeholders; and • Editing and distribution of information materials to the different target groups of the project. The overall budget was EUR 937,834 with EU funding amounting to EUR 844,050." [11]

• "Ecological restoration of Comana Wetland in Giurgiu County"; "The benefits from the project include: • Improved quality of habitats and species richness; • Avoided habitat fragmentation and disruption of the migration route of some fish species; • Avoided biodiversity loss, in particular of important bird species; • Temporary job creation related to implementation of Green Infrastructure measures; • Local development opportunities for establishing recreational and / or scientific research activities for users from the nearby capital Bucharest and other cities; • Increased climate change mitigation potential of the area; and • Raised awareness of local people about the benefits of Green Infrastructure. The Giurgiu County Council in partnership with the Comana Nature Park and Comana Local Council implemented the project; its overall cost was EUR 1.8 million." [11]

5. Research methodology

The quantitative data were mainly collected from the publication issued by the European Union in the field of the transport and also issued by the competent authorities in Romania. The results of the quantitative

research methods were taken especially from the documents issued by the European Union regarding the greenhouse gas emissions, the weight of the electric cars in the total existing cars, the rate of the employment in the transport sector. The qualitative methods from this paper aim to highlight the importance of sustainable transport for a green economy, presenting the way of work and the importance of the European networks in the fields of the green transport and the main international economic policies that may transform the unsustainable transport to a sustainable transport.

6. Results and discussion

The results of the research carried out in this paper are highlighting that the transport sector is one of the most important issue of the transition to a sustainable economy. This sector has both an economic impact, through the costs and the benefits involved, but also an impact on other related fields, such as social, psychological and environmental. The main social and psychological problems which characterizes the transport sector at present are related to the separation of the communities, the effects of congestion and its consequences on labor productivity, as well as issues related to the health of the population or the access to certain services for certain social classes. The environment is affected by the fact that, at present, the transport sector is one of the three economic branches that contribute the most to the increase of greenhouse gas emissions, together with the industry and the building sector.

„Statistics learn that over 90% of all road transportation relies on oil. This figure almost goes hand-in-hand with the total

global oil consumption, which stands at 60%. All these scenarios have caught the eyes of most governments and policies are being formulated to reverse this worrying trend of air pollution” [5]

The growth of this sector in the last years worldwide is explained by the strong relationship between the transport sector and the economic growth. The transport demand for passenger and for freight is steadily growing, which determines the development of the transport sector at an high rate, which is, currently, mainly unsustainable.

In order to make the transition to the sustainable transport, all the elements related to this sector must be improved - the infrastructure, the vehicles, the transport models, the telecommunications technologies, the transport systems, the type of fuels and of all other materials.

From this research, it turned out that a very important role for the future sustainability of this sector have the States that have to get involved through their economic policies both directly and also indirectly by encouraging the private subjects to invest in this field. The State also plays a very important role in raising the awareness of all the other economic subjects about the importance of making the transport sustainable.

At the European Union level, transport policy has been addressed since the Treaty of Rome, which aimed to ensure a fair competition and a sustainable mobility. Another important document issued in 1985, the White Paper on Transport, as well as the package of measures for greening the transport, published in 2008. The report “Together for competitive urban mobilization”, published in 2013, was desired to implement the sustainable urban mobility.

The number of jobs in the transport sector will change. At the moment, it is dominated by men, who reach in the European Union about 80% of the total number of employees. The changes suppose reorienting the labour force in function of the new types of jobs. The new jobs will be related to the activities for the production of the biofuels, of the sustainable materials, of the electrical vehicle, of the infrastructure.

The transition to the green, transport is relatively slow, and the biggest possibilities are in the developing countries because they do not have to change some existing forms and models, but they have to provide the transport directly in a green, sustainable way.

An essential element is also the financing reform, which must cover all the transport sectors and at all levels. The state must orient the resources from unsustainable to sustainable transport. The States should grant more subsidies or tax exemptions to those who bring improvements in the field of green transport and should find effective ways to encourage the financial institutions to give easier and higher amounts as credits for this purpose.

7. Conclusions

This article supports the most of the previous researches.

Nowadays, it must be a priority for all managers, including the State, the transition to a type of economy that has fewer negative effects on the environment, as well as fewer negative effects at the social and economic level. The sustainable management is very important, especially nowadays, made progresses which allow changing the vision and

the economic behavior in order to increase the economic efficiency.

The sustainable management in the field of transport is an essential condition for the current economic development because transports are the ones that connect the representatives of demand and the representatives of the supply on all the markets, they are necessary in all branches and all economic activities. Their present evolution is made with the price of increasing the greenhouse gas emissions, since transport is one of the three branches that contribute most to the increase of emissions together with the industry and the buildings sector, the most polluting of its sub-sectors being the road transport, which produces over 70% of total emissions. This branch also implies the excessive consumption of some material resources, one of the reasons being the fact that the technical progress is relatively slow compared to the growth rate of this branch.

In addition to the negative effects on the environment, the present development of transports also has negative social and psychological effects, as it increases the number of vehicles in traffic, it creates the congestion and the separation of the communities, as well as problems related to population health or access to certain services, for certain social classes. The social and economic effects include the reduction of labor productivity, as a result of the increase of the transport time.

In order to make transport more sustainable and greener, it is necessary to improve the elements related to everything that belongs to this field, such as - the necessary infrastructure, the vehicles, the transport models, the telecommunications technologies, the creation of smart transport systems, the type of fuels, the creation of the green

cities.

In order to make the transition to the green transport, the State has an important role, because it can adopt and promote different measures in order to avoid the transport, to change the behavior of the economic entities towards this activity, by modifying the transport models, by elaborating the different regulations and by monitoring and control.

The State must develop the public transport so that individuals are less forced to use the private and personal means of transport, and must encourage the partnerships between the public and the private sectors, so that the private sector becomes much more involved in this activity.

At the European Union level, the transport policies have been addressed since the Treaty of Rome, with the aim of opening the markets, to ensure a fair field of competition, as well as ensuring sustainable mobility, which means more efficient mobility in terms of cost, but also of traffic control. Subsequently, a series of documents called "White Paper on Transport" were elaborated, through which, gradually, a series of objectives were decided for the greening of the transport, for achieving the sustainable urban mobility, for a better connection of the European countries through the development of transport networks, for the

modernization of the infrastructure.

In the European Union, as a result of the specific measures taken in each of the transport sub-sectors, more progress has been made in recent years - the safety of air, maritime and road transport has been increased, a more comfortable working program has been developed for those who are working in this area, there were created more transport possibilities for all types of passengers and goods, the technological progress was introduced, pursuing a more ecological and a more environmentally friendly transport, the pollution level was reduced. The three European projects - GALILEO, ERTMS and SESAR deserve to be mentioned.

In Romania, a series of measures for transforming the transport into a sustainable transport have been adopted, which include specific sets of measures for each sub-sector and which seek to align with the provisions of the European Union. In the different national strategies regarding the transport sub-sectors, it is foreseen to adopt measures in order to reorganize the activity according to the European Union directives, to establish a strategy of optimizing costs and increasing efficiency, to promote the most appropriate types of transport for both goods and as and for travelers, to reduce risks and to optimize the transport models.

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