POSSIBILITIES FOR THE DEVELOPMENT OF THE CONCEPT OF GREEN LOGISTICS IN SERBIA ACROSS THE TRANSPORT SECTOR

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Abstract: The concept of Green logistics represents a phase in the evolution of logistic sector which in fact means efficiently undertaking logistic activities with less pollution and harmful influence on the environment. Regarding logistic activities, the European and world trends put the largest pressure on the transport sector, which needs to become more energy efficient, more sustainable and better connected with a higher level of environmental protection. In this survey, we are dealing with a challenge and possibilities for the system, that will be intermodal, efficient, integrated, sustainable and harmonized with the needs of future development in the market of transportation sector. Given the undeveloped infrastructure of the environmental acceptable types of transport, actions of the government of Republic of Serbia which are directed towards the development of transport services and investments in modernizations of infrastructure would not be enough for future development of the Green logistics concept. It is necessary for local communities to take part in identifying advantages and development potentials of building intermodal terminals, and participation of industry and private companies that will see an opportunity in accepting green concepts as a way for improving their competitiveness. With coordinated action at all three levels it is possible to include successfully Serbia in modern flows of transport.

Key words: Green logistics, Intermodal transport, Republic of Serbia.

1. INTRODUCTION

Logistics as a way of managing complex operations that covers flow of goods, people, information and resources, from the starting point to the final destination represents a key function and part of modern transportation system. Modern technology and spatial development have affected costs, efficiency and reliability of freight and passenger transport system. At the same time, negative impacts of transport on the environment have become a key question of sustainability.

With a development of ecological awareness, the brand new subsector of transport emerged, Green logistics, that uses new models and tools of managing logistics. Green logistics aims at achieving maximal efficiency of logistics operations with minimizing harmful impact on the environment. This survey presents some of the ways how we can achieve that by using logistics operations via sector of transport.

The European Union project, the Green corridors, was introduced in 2007 with the aim to allow development of integrated, efficient and ecological friendly transport of cargo through main lines and on relatively long distances, and it supports an EU agenda aimed at maximizing energy efficiency and reducing influence on the environment through reducing CO2. Such corridors will gradually be introduced in all the major transport routes through Europe. They represent the improved transport corridors and they should be used as a platform for future development of global logistics management system in Europe. EU has supported this initiative through the set of new laws, which represents an effort to develop
a necessary environment for their easier implementation and for development of a brand new intermodal network that uses modern transport technologies.

In EU regions with poorer and underdeveloped economy, the green way of thinking has not been developed yet. This is especially true for the Western Balkans region. The main reason for this is that the funds, which are necessary for the development and modernization of existing transport infrastructure and equipment, are limited. However, the inevitable global trend of development and adoption of Green logistics becomes present in every sphere of national industry, especially in manufacturing and transport. Countries in the Western Balkans region will soon be forced to develop a green conscience and to use green technologies regularly. European integrations just build up pressure on the development of transport infrastructure and states in the region are forced to adopt the long-term strategies of development. As a result, intermodal and green transport will further develop to sustain a platform for rapid development of Green logistic concept.

2. THE DEVELOPMENT OF INTERMODAL TRANSPORT AS A KEY FACTOR FOR INTRODUCING GREEN LOGISTICS INTO SERBIA

The economic situation in Serbia is not nearly good as the situation in developed countries in western or northern parts of Europe. The whole region of Balkans is economically underdeveloped, and that has an influence on transport infrastructure. The Republic of Serbia invested great efforts and resources in the development and modernization of highway infrastructure, but at the same time the railway infrastructure is old and it is more than obvious that it needs modernization as well as the river routes. The intermodal transport in Serbia, in comparison to the other EU countries can be observed as severely underdeveloped. One can conclude this if we compare the complete number of transported TEU units (intermodal containers of standard length - 6,1 m), percentage of intermodal transport, the level of infrastructure development, but also the degree of required legal regulations, standards and state transport policy related to the field.

Regarding transport infrastructure and general economic situation, the development of intermodal system is necessary. The biggest barrier in the development of Green transport and Green logistics is a fact that the railways, river ports and terminals are still owned by the state and therefore are subjected to state development strategy policies. On the other hand, the domination of road transport in the sector of freight transport in Serbia is a consequence of limited financial resources for investment in modernization of alternative infrastructure that is more environmentally friendly, such as railway and river transport. The percentage of road freight transport, in t/km, is higher in the Southeast Europe than in the region of North Europe that results in higher CO2 emissions and bigger cost of transport. Serbia has been ranked fifth within the European biggest polluters, with a yearly emission of CO2 per capita of 6.2 t which is twice than average of other countries with similar income or level of development. The transport sector, with its 15 % of all CO2 emission, represents one of the biggest polluters of the environment. Intermodal development is considered as the element that can reduce fuel consumption and emission of CO2 by 50% per kilometre.

Green logistics concept is based on the development of environmentally friendly ways of transport, railway and river transport, which must be developed as a key solution for the transport between intermodal terminals (node). These terminals must be built so that they can function as a modern intermodal logistics platform. On the other hand, road transport should be used only for short destinations.
Serbia is located on the Balkan Peninsula, at the intersection of major transport Corridors between East and West. Therefore, it has a strategic importance in the field of transport, logistics and communication in the region. Its territory is connected with Western Europe, Middle and Far East. Given the global development trends, it is necessary to increase its participation in intermodal transport in the nearest future.

Development and modernization of railway network, mainly on Corridor X, will enable the increase of container transport via railway network and relief on roads, that have to be used only for start and final container transport. This is important because of the fact that in Serbia still dominates container transport by road. Although railway has the largest share in all the transported goods in Serbia during recent years, those figures are still minor and do not lead to higher utilization of capacity of Serbian Railways.

Observed from the aspect of the environment, railway transport represents the most energy efficient mode of land transport and the CO2 it produces is the least of all of the modes of transport. Railway transport emits on average three times less CO2 than the road transport and five times less than the air transport. The railway freight transport is eight times over energy efficient than freight transport by road.

Intermodal transport represents obvious choice because it allows an increase in use of railway transport, while we can easily manipulate with intermodal units in short period, which generate savings in cost. At the same time, the security of cargo is placed at a higher level that can reduce damage in freight and packaging in transport.

At the same time, thanks to navigable rivers and channels, Serbia has natural conditions for further development of river traffic. Pan European Corridor VII – river Danube, represents a significant European river highway. On the river, Danube about 85% of total transfer of goods is conducted on the inner river roads of Serbia. In the future, river Danube will gain on its importance, because it will open great possibilities of cheap river traffic of goods.

Despite one of strategic priorities of traffic policy of EU that is increasing of inter water transport, as more efficient and environment friendly, in Serbia it did not come to a significant improvement in the previous period. In the recent years, this kind of traffic of goods is in decline in overall structure of freight transport in Serbia.

Safe navigation with modern floating assets, development harbour activities, implementation of intermodal transport with a support of logistical systems can result in the increase of the transport volume and increasing the importance of river transport. Serbian economy would gain a rational, more efficient, environmentally friendly way of transport that is competitive on the market.

Governments in the region have taken some measures to establish a green agenda on macro national level, but those actions were not aggressive and clear enough so they could adequately stimulate industry as a whole. Serbia has to take active participation in establishing Green logistic strategies on a macro level, including the industrial sector. All the participants have to perceive the advantages of implementing Green logistics as a national strategy and as a corporative strategy in companies. It is vital for economy and industry to realize the advantages of Green logistic, having in mind the main goal of optimizing the transfer of goods, cutting costs, increasing efficiency and improving the quality of transport services, and inducing the increase in environmental protection.

2.1 Current state of Serbian intermodal network

Transport in Serbia is mostly performed by individual shipments by road. Development of intermodal transport is at its very beginning. In the Republic of Serbia, transport amounts up to 0.5%, in EU countries it is 6-9% and the estimate is 16% by 2015.
Intermodal transport is mainly present in foreign exchange and it mainly consists of import of containers shipped by sea and returning them empty to naval harbours. Total volume of transport of intermodal transport units in import-export traffic was 50,000 TEU. Over 99% of containers in traffic in Serbia are the property of foreign companies. Considering that the import is higher than the export, empty containers are withdrawn to depots in region.

Swap bodies are rarely in the ownership of Serbian transport companies. The only case where the swap bodies are transported is from/to Hungary by trucks, rather than by train, and because of the lack of containers the shipping takes days. Bimodal units are not present in transport in Serbia.

Containers from Serbia are generally shipped to the USA and the Middle East, and we import from the Far East and from the USA. In Serbia, there are three terminals for reloading of containers: terminal of Railway integral transport (ZIT), located at the Main Railway station in Belgrade, Belgrade harbour and Pancevo harbour. ZIT is the only company in Serbia whose main activities are an organization of transport of containers via railway and reloading containers from train composition. Within this bimodal terminal about 80% of total reload of containers in Serbia is made.

The aforementioned terminals do not use modern technology for cargo handling, the degree of automation is very low and their capacities cannot sustain optimal process of cargo handling. Cranes on container terminals are repeatedly being repaired but they are still in function. Two out of three terminals are located in Belgrade, in central urban zone and without any possibility of spreading the terminal space. Lack of modern terminals and stations open for business with dangerous goods influenced that the dangerous good is mainly shipped by road, and a fair share of goods that required intermodal transport is being denied. Lack of modern reloading equipment and modern information technology for tracking containers in terminals has bad influence on quality of intermodal services.

Railway network in Serbia is as in the medium-level developed countries, in regards of length of railway network relationship to surface (49.2 km/1000 km2), and it is in poor condition. Railway network capacity is sufficient, but its exploitation of technical performance is inadequate for providing quality transport services. Due to the lack of funding the investments in railway transport resources, maintenance of infrastructure in the last twenty years was insufficient.

In Serbia, there are nine harbour ports of international importance. River ports are of adequate capacity for present needs, but the equipment is old and ineffective. Only the Belgrade harbour alone has the conditions for container transport, while no harbour has Ro-Ro terminals. Harbour capacities, due to the lack of goods for transport, have only 30% of utilization.

It is obvious that there is a lack of modern cargo-manipulative units, transport and reloading means, cargo units and technology that is capable with all the links in the logistic chain. Logistics services in Serbia are of low quality, in regard of time, costs of delivery, delivery reliability, without any change in logistic strategy, which affects the price and the competitiveness of product.

Some of the main reasons that lead us to domination of road transport services in Serbia are an unreliable and inefficient railway service, which is characterized by bad labour organization then long time of transit, bad condition of railway tracks and lack of capacity (locomotives and special wagons). Moreover, by low level of river transport services, which is also characterized by the lack of capacity (small number of barges and absence of Ro-Ro ships in the ownership of Serbian citizens), and the lack of operators who would implement river transport services. All this creates conditions for the implementation of Green logistics in Serbia.
Lack of infrastructural capacity needed for successful development of intermodal transport is reflected in absence of appropriate terminals. Because of that, it is necessary to identify projects of national importance that would increase the participation of intermodal transport in total transport of goods, and which is directed on development of terminals for intermodal transport units reloading.

European Commission White Book – Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system published in Brussels on 28th March, 2011 in whole directs and supports forming of intermodal terminals especially in Eastern Europe with a purpose of cutting pollution and forming a faster, cheaper and healthier transport system in EU. European goal is the reduction of CO2 gases which form greenhouse effect by 60% in transport sector between 1990-2050 through changes in consumption of transport fuel and in ways of conducted transport process.

In order of creation, alternatives to road transport it is necessary for State to get more involved so it would with stimulating measures make future intermodal development easier. By stimulating future development of intermodal transport with adequate national transport policies it promotes intermodal transport by adopting long term programs aimed at investments in infrastructure of intermodal transport, forming green corridors, forming intermodal terminals and connecting into viable transportation network, forming green corridors and reducing pollution in transport. In order to reduce harmful influence of transport on the environment we must provide:

- Development of environmentally acceptable intermodal transport, economic viable and safe form of transport;
- Implementing efficient international railway transport;
- Reconstruction of road infrastructure;
- Improvement quality of road transport, primarily on important international corridors;
- Increase level of safety and efficiency of river transport primarily on the river Danube.

Framework point 4.2. of development of railway, road, river, air and intermodal transport strategy in the Republic of Serbia from 2008 to 2015 gives directions for considering suitable locations and defined needed infrastructure for development of intermodal transport by the EU standards.

Potential intermodal transport routes for import, export and transit represent two very important corridors, road-railway Pan European Corridor X, which connects nine countries from Germany in the West to Turkey and Greece in the East of Europe, and Danube river road, Pan European Corridor VII, which connects ten countries from Germany to Ukraine and consist of 44 international harbours.

Terminals on these corridors have to be strategically designed and located near junctions of important transport infrastructure (road – railway – river) with flexibility and possibility of extending with the demands from the market. When considering suitable locations for initial development of terminals, in accordance with the practice and demands of EU, we have to consider railway, road and river network connections. 7

2.2 Opportunity of introduction a three-level concept

Development of Green logistic in Serbia has to be represented within the national strategy, whose priority would be to promote the introduction of green corridors in accordance with
the EU program and development of intermodal capacity for these corridors and with support from the economy. Green logistic can be implemented on three levels:

1. On national level, in accordance with the general Master traffic plan in Serbia – Final report – Annex V, whose realization was conducted by the Delegation of European Commission in Serbia it has been said that firstly at least three terminals have to be build – “dry harbours”, of different sizes and characteristic, in the area of Belgrade, Nis and Novi Sad. This must be done with necessary intermodal capacity that would lead to recovery of railway transport system, with clear advantages for the environment and community, and with the accordance with the EU policy. 8

Due to the fact that transport Corridors VII and X intersect in Belgrade, which means that the town is very important junction, Belgrade dry harbour is represented as the state priority in the general master plan. As the concentration of present and future cargo transport primarily refers to the Belgrade area, because of traffic combustion it is very hard to get to terminals ZTP and Belgrade Harbour, even with this low volume of occupancy capacity. Master Plan for City of Belgrade includes relocation of both terminals from existing locations.

So the implementation of these projects would not be limited just to the level of a project and forming state agencies or administration within the ministries, we have to find a solution for financing such projects. We can expect that the funds given from foreign credits and in the years to come have to be mainly directed to the revitalization of railways. For significant investments in intermodal infrastructure, it is necessary to find interested harbour or intermodal operators as concessionaire, so the agreed arrangement in the form of the public-private partnership would be a solution in the near future. Good strategic partnership, beside finance support, brings a transfer of knowledge, new technology and elevation of general financial efficiency.

Nevertheless, states of the Western Balkans have to elect priority transport routes that will be gradually developed as green transport corridors, together with the active participation in EU programs, which will result in more money from EU funds.

2. On the regional level, it is necessary to develop a network of smaller intermodal terminals on different locations. These terminals have to be developed mainly through Corridor VII and X, and that would be the best thing to do in the Free Zone. Terminals would contain capacity for reloading of goods, storage, loading and reloading of goods in transport units, and they have to be adjusted to modes of transport, which would decrease transport cost and cut pollution.

If we know that the budget resources for this type of project would be uncertain, local communities have to find a common interest for developing terminals, and within mutual linkage and partnership define priorities and develop projects taking into consideration their needs and projected development of transport. For the realization of projects they can apply for funds in numerous EU programs which will be available until 2014, as for the resources from funds from other countries, and from programs of cross-border cooperation of municipalities and towns. It is very important for local economies and companies to recognize advantages of intermodal transport and find interest in investing in these zones and terminals.
3. On the economic level, all the aspects of the environment become a big part of strategy of development in big companies. Companies today operate in the time when the logistic process has to be managed as Green logistics. Green concept management of logistic has to start using recycled materials in the production and usage of environmentally friendly means of transport. Serbian economy has to learn from the practice of Fiat Group, whose production and business is world class. In addition, it should be an example of how environment sustainability can add value through logistic process.

Fiat Group has accepted Green logistics and fosters it as a part of business model of world class. Fiat Group is dedicated to reducing influence of its logistic process on the environment, with a special twist on reducing CO2 gases, using their four areas of interest:

- Increasing transport with reducing CO2 gases,
- Usage of intermodal solutions,
- Optimization of transport capacity,
- Reduce the usage of packaging and protective materials.

Green concept of management of logistic has to start by using recycled materials in manufacturing and by using environment friendly modes of transport. This way the final product will be easier to recycle with less usage of energy and in shorter time, which will improve the producer’s competitive position.

Introduction of Green logistics on the global level of a firm through the usage of environmentally friendly modes of transport and usage of recycled materials does not impose higher financial investments and does not increase overall costs, and it represents a key marketing activity, especially for markets and consumers that are green-oriented. As the increase of expert is the priority for the economic development and growth of Serbia, vast publicity is given to the environment; environmental tendency can become one of the factors of identifying our economy on foreign markets.

On the other hand, European integrations will make the state intervene more aggressively and target environmental polluters. As the state of Serbian economy is very bad, costs that are created because of pollution cannot be an industrial priority, given that all the firms are under pressure to stay solvent. As a result, the road transport will still be the backbone of transportation of goods, and future investments in railway and river infrastructure will have to be postponed, because the industry is not interested in using its full potential. 4

The solution for implementation of Green logistics is possible to find in clear policy of development of intermodal transport in Serbia that has to be compatible with Europeans trends and has to reflect needs of transport market. Orientation on an intermodal transport system will depend on the existing resources and validity of future investments on one hand, and the readiness of state to get involved in the modern transport flows and trends of protecting the environment on the other hand.

4. CONCLUSION

Green logistics will change modern transport policies, business and frames of behaviour of participants in logistic operations, and it will become a start of future innovation, creating jobs, reducing CO2 gases and creating greenhouse effect, and it will create competitive edge for users of intermodal transport.
Serbia is located on the crossroads of main transport corridors between East and West. Its territory provides natural, short and rational road and railway connections with Western, Middle Eastern and Far East countries.

Intermodal traffic in Serbia is described as insufficiently developed. It lacks institutions, network of modal intervals, obsolete cargo loading units, adjusted transport capacity of road, railway and river intermodal transport. Then, it lacks adequate logistic services, stimulus and financial mechanism for supporting the development of intermodal transport by attracting foreign investments in the infrastructure.

The development of intermodal transport in the Republic of Serbia, as a transport of wider interest, that is environmentally friendly, economic viable and safe, demands state support, in regard of giving stimulus through building a modern terminals of intermodal transport. Building terminals would have a great impact on the development of the entire system of transport and the economy as a whole, especially in less developed areas. Construction of new terminals would have to be realized on the grounds of cooperation of both the state and the private sector. Creating conditions for the usage of environmentally friendly modes of transport has to encourage industry and producers to optimize their logistic process and to use road transport just for short distances, to increase their freight capacity and reduce the number of vehicles.

REFERENCES:


