

INTERMODAL TRANSPORT TO REDUCE CO2 EMISSIONS

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Abstract: The logistics and transport have played a strategic role in the process of globalization of trade allowing the development of the free market. The new targets for the containment of costs and CO2 emissions are challenges to innovation such as the methods of the technical resources, focusing on new propulsion systems and new fuels, trying to improve infrastructure such as ports, interports, railways and roads to make them more efficient and less intrusive for the area, the nature and ecosystems. The directive about transportation in Europe has been drawn up in Brussels in 2011. This document, the White Paper, showing the analysis of the transport sector, it determined some elements like: the necessity of the international cooperation to make efficient the decisions, the need to diversify energy supplies and the necessity to contain the polluting emission and maintain the global warming under 2° Celsius. It is necessary to support new modes of transportation in order to deliver higher volumes of goods and a greater number of passengers using transport or the combinations of transport more efficient. The need to create more favourable conditions for the achievement of the goals set from Europe is urgent and can only be met through intensive work, starting by schools and universities. Also a closer collaboration between the public and private sector will be key to a creation of conditions for development intermodal transport, to create a growing demand for sustainable transport.

Key words: *Intermodal transportation, reduction of CO2, White paper, sustainable transport*

INTRODUCTION

The logistics and transport have played a strategic role in the process of globalization of trade allowing the development of the free market. The new targets for the containment of costs and CO2 emissions are challenges to innovation such as the methods of the technical resources, focusing on new propulsion systems and new fuels, trying to improve infrastructure such as ports, interports, railways and roads to make them more efficient and less intrusive for the area, the nature and ecosystems. We know that the production, transport and consumption of goods produce emissions.

Logistics is that activity which studies how to optimize procedures for the acquisition, production and distribution of goods and services with a high level of performance and limiting costs.

DEVELOPMENT

In order to attend a reduction of emission, a company can choose between different solutions: at the beginning they can start to skip from the fastest and most polluting way, such as road and air transport, to slower and less polluting modes such as rail or sea transport. An interesting solution

is the intermodal road-rail-sea transport. If we combine more modes of transport to transfer a load of goods or more loads of goods, we are talking about intermodal or multimodal transport. To take advantage of this kind of transport are required intermodal transport units, container and swap bodies. The introduction of these elements allowed the standardization of packaging goods and it made possible the growth of intermodal transport.

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- 1) Deployment of the modernised air traffic management infrastructure (SESAR) in Europe by 2020 and completion of the European Common Aviation Area and deployment of equivalent land and waterborne transport management systems. Implementation of the European Global Navigation Satellite System (Galileo).
- 2) A fully functional and EU-wide multimodal TEN-T ‘core network’ by 2030, with a high quality and capacity network by 2050 and a corresponding set of information services.
- 3) By 2050, connect all core network airports to the rail network, preferably high-speed; ensure that all core seaports are sufficiently connected to the rail freight and, where possible, inland waterway system [1].

Table 1: Ten objectives for a competitive and efficient transport system in terms of resources.

2020	<p>1) MAKE OPERATIVE SESAR FOR THE AIR TRAFFIC AND THE EQUIVALENT SYSTEM FOR INLAND AND SEA TRAFFIC ALONG WITH GLOBAL NAVIGATION SATELLITE (Galileo).</p> <p>2) DEFINE AN INFORMATION SYSTEM, MANAGEMENT AND PAYMENT FOR INTERMODAL TRANSPORT.</p> <p>3) HALVING THE NUMBER OF VICTIMS IN THE ROAD.</p>
2030	<p>(1) HALVE TRADITIONAL FUEL VEHICLES AND CREATE URBAN LOGISTIC SYSTEM WITH ZERO-EMISSION CO₂</p> <p>(2) FOR DISTANCES GREATER THAN 300 KM, 30% OF THE FREIGHT WILL BE TRANSPORTED BY RAIL OR INLAND WATERWAY.</p> <p>(3) TRIPLE THE HIGH-SPEED RAIL NETWORK</p> <p>(4) MAKE OPERATIVE AN ESSENTIAL NETWORK TEN-T MULTIMODAL.</p>

2050	<ul style="list-style-type: none"> (1) ELIMINATION OF TRADITIONAL FUEL POWERED VEHICLES. (2) LOW-CARBON SUSTAINABLE FUELS IN AVIATION TO REACH 40% BY 2050 AND REDUCE EU CO2 EMISSIONS FROM MARITIME BUNKER FUELS BY 40%. (3) BRING THE GOAL (2) OF 2030 TO 50% IN 2050. (4) COMPLETE THE HIGH SPEED RAIL NETWORK. (5) GIVE EFFECT TO A NETWORK WITH HIGH QUALITY AND CAPACITY, CONNECTED TO INFORMATION SERVICE SYSTEM. (6) CONNECT PORTS AND AIRPORTS TO NETWORK RAIL OR INLAND WATERWAYS. (7) MOVE CLOSE TO ZERO FATALITIES IN ROAD TRANSPORT.
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Source: Authors

With a share of 19.5% of total emissions in 2008, transportation is the second biggest source of emissions in the European Union and it is the sector that has shown a steady growth in emissions, is also responsible for other negative externalities such as congestion traffic, traffic accidents and noise [2].

Create or modernize infrastructure is needed to break down the environmental and economic costs in the long term but it's not possible realize a big changes in the transport sector without a support an adequate network and with a more intelligent use of that.

It is necessary to support new modes of transportation in order to deliver higher volumes of goods and a greater number of passengers using transport or the combinations of transport more efficient. In 40 years, as usual scenario, the dependence of transport on oil will be slightly less than 90% while energy from renewable sources would have been slightly above the target of 10% laid for 2020 [3].

In 2050, CO2 emissions from transport would remain one third higher than 1990 levels. By 2050 the Congestion costs will increase by 50%, it will accentuate the accessibility gap between central and peripheral regions and will continue to increase the social costs of accidents and noise and air pollution. Investment in transport infrastructure have a positive impact on economic growth, creating wealth and employment and enhance trade, geographical accessibility and mobility of people, but must be planned in order to maximize the positive impact on economic growth and to minimize the negative consequences for the environment [4].

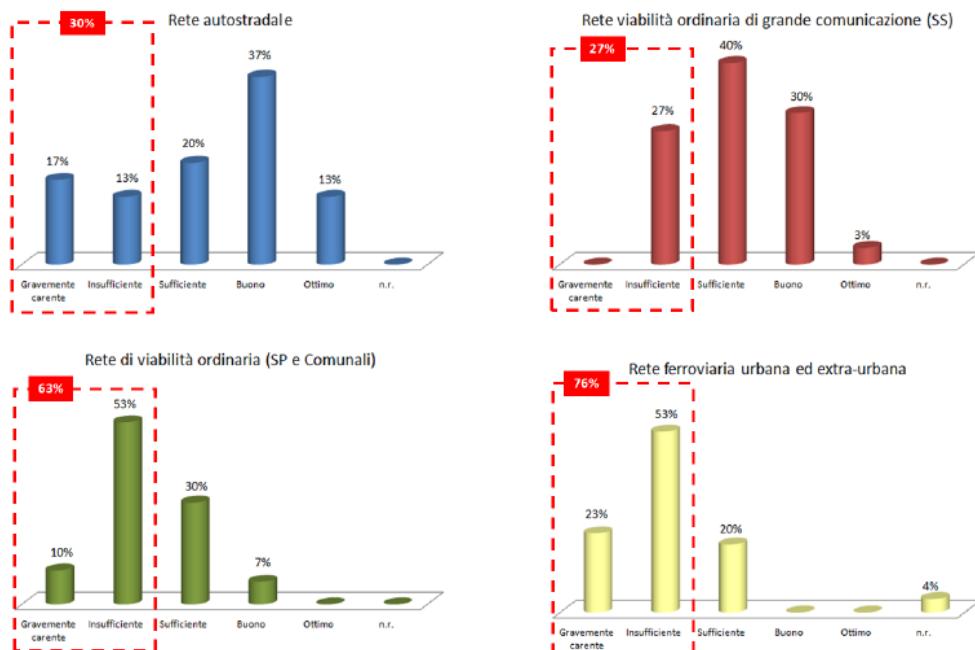
During our research we analysed a case study about the infrastructure that are in Puglia region, and which are the next step to improve the transport system in this area.

The road network in Puglia region has 13,000 km, corresponding to 17% of the road network in southern Italy. Over 85% of the network is made up of regional and provincial roads, and the motorways represent less than 3% of the network [5].

The railroad is still not competitive with the road and is also under dimensioned compared to the mobility needs of businesses. The railway line in Puglia has a total length of 838 km and consists of approximately 600 km of electrified lines, while the km double track are 400. The same ports are lacking of efficient rail links with the national line[6].

Compared to the geographic variables, demographic and social characteristics of the area, the railway network is too small compared to the potential needs of the population and the employed, which use rail transport for moving house / work.

Figure 1: Critical issues of the Puglia infrastructural system



Fonte: elaborazione Uniontrasporti su dati Indagine Amministratori Camerali 2011

Source: [7]

It is absolutely necessary to complete and interconnected infrastructures of Puglia, railways, roads, highways, ports, airports that are certainly not a few in this area, but in some cases it need to be completed, upgraded, interconnected, specialized.

Such as completion of road and rail links gravitating to the port of Taranto, that became the second largest in Italy, in 2006, after Genoa with a total movement of goods, over 49 million tons [8]

About the airport system: the airports of Bari, Brindisi, Foggia and Grottaglie must also be connected to each other with specialized functions.

Rail connections must be completed with some of their functional improvements: completion of the doubling of the Bari-Lecce rail, the completion of the Bari-Taranto rail and start the construction for the new Bari-Napoli [9].

CONCLUSION

Through the creation of a global transport system the objective of reducing emissions is not so far away. If we consider that a truck of the last generation emits 240/250 g/km of CO2, regulatory euro 5 for motor fuel efficiency combustion of fossil fuels, a reduction of 20% of total emissions is only possible through a more intensive use of trains instead consume 44 g / km of CO2 and can lead to many more containers or swap bodies unlike trucks [10].

The need to create more favourable conditions for the achievement of the goals set from Europe is urgent and can only be met through intensive work, starting by schools and universities. Because there's a need of a transport culture, which is the more polluting means of transportations, how to drive in a less polluting way and that is better to use the public transport where and when is possible.

A closer collaboration between the public and private sector will be key to a creation of conditions for development intermodal transport, also in the cities, and to create a growing demand for sustainable transport, for goods and people.

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