

# A European Ecobono. Addressing the need of a joint solution for the European Transport System.

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*Abstract:* - This paper identifies weaknesses and opportunities in current Ecobono formulas (ecological bonus given to Short Sea Shipping users due to maritime transport lower externalities) using a SWOT analysis and presents an alternative European Ecobono. Among major findings we reached are the facts that weaknesses produced or inherent to current formulas as unfair competition between road carriers and budget limitation for the enforcement would be eliminated in case of applying a European alternative. The conclusion derived from the study brings out the idea that it is not possible to achieve collective European objectives by means of measures applied by individual member states.

*Key-Words:* Short Sea Shipping, externalities, ecological bonus, European Transport System

## 1 Introduction

Since the early 90's, using different strategic lines of action, the European Union (EU) is working in order to achieve a balanced and efficient transport system. This is not an easy task taking into account the overall increase suffered by the intraeuropean freight and passenger transport in the past years, 34% (goods) and 22,5% (passengers) since 1995 [1].

Besides, the share out of the intraeuropean transport it is not balanced at all, and the prevailing mode of transport is not the greener. Road (46%), sea transport (37%), railway (11%), inland waterways (4%), pipelines (3%), Air (negl.) [1].

This paper is divided in four sections. Firstly, different existing methods and tools, nowadays in place, aiming a sustainable transport system are described. Secondly, the Ecobono as a European measure is introduced for discussion. Thirdly potential benefits together with the results are presented and finally conclusions are put forward.

## 2 The scenario

Nowadays the European transport system presents weaknesses because most means of transport fail to

fully cover their external costs. These are classified in 5+1 categories: climate change, noise, congestion, accidents, air pollution + infrastructure costs (construction and maintenance). The first five categories are well recognized as external costs, but infrastructure costs are still not recognized and quantified as such.

The following are the principal inefficiencies of the existing transport system:

- Unfair competition between means of transport
- Inefficient development of the transport system
- Penalizing of green products and services
- Depletion of environmental resources
- Idle allocation of public resources

In the face of this scenario the ways to intervene and rebalance the reigning transport system go through:

1. Internalizing external costs. The user pays the whole costs (direct and indirect) originated by the mean of transport at issue.
2. Reducing external costs directly. By means of the regulatory framework.

3. Reducing external costs indirectly. Promoting greener means of transport with tax reduction, fare subvention, etc.

Employing aforementioned ways of intervention the EU has developed its own tools to rebalance the transport system.

Internalizing external costs looks the simplest, but in real the impact that such a measure could have in the transport sector make the parties involved to act cautiously in this direction. A clear evidence defending the idea is that since the first publication in the issue was released, “Green Paper – Towards Fair and Efficient Pricing in Transport Policy – Options for internalising the external cost of transport in the European Union” [2], little has been done.

Regarding developed tools aiming a direct reduction in external costs, it must be stated that especially in road transport important progress has been made. Since 1988 when the first Euro regulation was adopted by the European Parliament, Euro Standards have evolved hard, passing through Euro 0 standard to Euro V standard nowadays, and limiting pollutant emissions from vehicles sharply.

Standard	CO (g/Kwh)	NO <sub>x</sub> (g/Kwh)	HC (g/Kwh)	PM (g/Kwh)
<b>Euro 0 (1988)</b>	12,3	15,8	2,6	none
<b>Euro I (1993)</b>	4,9	9	1,23	0,4
<b>Euro II (1996)</b>	4	7	1,1	0,15
<b>Euro III (2001)</b>	2,1	5	0,66	0,1
<b>Euro IV (2006)</b>	1,5	3,5	0,46	0,02
<b>Euro V (2009)</b>	1,5	2	0,46	0,02
<b>Reduction</b>	88%	87%	82%	95%

Table 1. Reduction in Heavy Duty Vehicle emissions. Source own, based in EU regulation [3].

On the other hand maritime transport has not yet being framed under such an strict regulatory framework in terms of pollutant emissions. Although the MARPOL convention since the entry into force of its “ANNEX VI: Prevention of air pollution from ships” in May 2005 and some european specific regulation, “Di. 2005/33/EC”, have started to keep down pollutant emissions from ships.

Standard	SO <sub>2</sub> (g/kg)	NO <sub>x</sub> (g/kg)	CO (g/kg)	NM VOC (g/kg)	PM (g/kg)
<b>2000</b>	50	88	9	2,74	7,6
<b>2005 (MARPOL)</b>	30	19,36	8,1	2,466	6,84
<b>2010(MARPOL +Di.2005/33/EC)</b>	9,64	19,36	8,1	2,466	6,84
<b>Reduction</b>	81%	78%	10%	10%	10%

Table 2. Reduction on pollutant emissions from ships. Source own, based on ICF tool from REALISE 2005 [4].

When it comes to the usage of indirect methods for redesigning the transport system, other EU projects and publications must be mentioned. For instance the TransEuropean Network of Transport (TEN-T), arisen in 1994 and revised in 2004, which establishes 30 priority projects for funding. Among EU publications the second White Paper: "European transport policy for 2010: time to decide" together with its midterm review in 2006 “*Keep Europe moving: a transport policy for sustainable mobility*” has to be appointed. This document gathers 60 or so measures to develop a transport system capable of shifting the balance between modes of transport. Within these 60 initiatives some of them have resulted very successful as the Marco Polo Programme for the promotion of cargo shift from road towards cleaner means of transports. Besides, the second White Paper also allowed the revision of the TEN-T extending the number of priority projects from 14 to 30.

Not all measures aiming a sustainable transport system have come up from the EU and some countries have developed their own measures. The Ecobono firstly applied by the Italian government, during the triennium 2007-2010, and later applied by the government of the Basque country, since 2008 and still in place, are some of those measures.

The Ecobono, the real issue of this paper, is an ecological bonus given to the road carrier in exchange for the utilization of SSS. This ecological bonus is feasible based in maritime transport lower external costs. The measure uses savings achieved due to the difference in external costs between road transport and maritime transport to promote Short Sea Shipping.

The European Commission defines Short Sea Shipping as “*the movement of cargo and passengers by sea between ports situated in geographical Europe or between those ports and ports situated in non European countries having a coastline on the enclosed seas bordering Europe*”.

### 3 The problem

As mentioned above the Ecobono formulas applied so far have been enforced independently by some governing authorities. This fact converted these measures vulnerable and inefficient.

Although, we think the idea lying behind is good and if it is applied properly the potential benefits are substantial.

Therefore, from now on, this paper deals with a new theoretical Ecobono proposal which is conceived in a community basis (applicable in the whole EU) to maximize its potential benefits.

#### 3.1 Methodology

Firstly keeping always in mind the objective of the measure to be designed, shifting of freight transport from road to Short Sea Shipping, critical issues to be addressed by the measure are identified and listed.

Subsequently an Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of current Ecobono formulas is done. This analysis on the one side enable us to identify positive aspects (strengths) to maintain and negative ones (weaknesses) to avoid, but on the other side also let us detect potentially fruitful areas to exploit as potentially negative issues to be borne in mind.

Once the results of the SWOT analysis and the critical issues are known, the new theoretical Ecobono formula is proposed.

#### 3.2 Analysis

Taking into account the scope and objective of the measure to propose, the following are the aspects that we have considered critical for its success and fair application:

- Fair competition among European carriers must be ensured, addressing the new Ecobono to all European road carriers.
- The proposed measure has to be easy to manage and obtain.
- Availability since the first SSS trip must be guaranteed, although promoting further usage of SSS.
- The European Ecobono has to promote high standard SSS together with improving its image.

As of today two different Ecobonos have been applied in the EU with little difference between

them. Below both of them are presented together with their main characteristics.

<b>Issuing authority:</b>	Italian Government
<b>Definition:</b>	Ecological bonus given to road carriers in exchange for using Short Sea Shipping
<b>Entry into Force:</b>	January 2007
<b>End date:</b>	December 2009
<b>Receiver:</b>	European road carriers
<b>Budget:</b>	231 Millions of euros
<b>Minimum trips:</b>	80
<b>Bonus:</b>	Up to the 30% of the ship fare, depending on the route and number of trips done per year
<b>Attached routes:</b>	29 (18 national and 11 international)

Table 3. Main characteristics of the Italian Ecobono. Source own, based on the Ministerial Act published by the Italian Republic on the 26<sup>th</sup> of March 2007 [5].

<b>Issuing authority:</b>	Basque Government
<b>Definition:</b>	Ecological bonus given to road carriers in exchange for using Short Sea Shipping
<b>Entry into Force:</b>	October 2008
<b>End date:</b>	Still in place
<b>Receiver:</b>	Basque road carriers, owning at least 3 vehicles
<b>Budget (first year):</b>	500 000 euros
<b>Budget (second year):</b>	150 000 euros
<b>Minimum trips:</b>	20
<b>Bonus:</b>	Up to the 30% of the ship fare depending on the number of trips done in a year
<b>Attached routes:</b>	All routes connecting a basque port with another in any of the member states

Table 4. Main characteristics of the Ecobono applied by the Basque government. Source own, based on the Official Bulletin of the Basque Country [6].

After an exhaustive study of the two formulas the following results were obtained from the SWOT analysis.

#### Strengths

- Alignment with EU transport policy (common objective)
- Promotes further use of SSS
- Efficient usage of transport resources along the Supply Chain
- Overall external cost reduction
- Improvement of the overall performance of the European transport system
- Promotes national and international joint ventures among carriers

#### Weaknesses

- Lack of suitable port infrastructure
- High SSS fleet average age
- Inefficient port services
- Complex legal framework
- Non standardized port dues
- Not reclaimable by all EU citizens
- Not in place for all SSS routes
- Limited budget, a sole country pays the measure while others are also benefited
- Source of unfair competition
- Reclaimable only beyond a number of trips

#### Opportunities

- Increasing road transport overall external costs
- Potential of Maritime transport in reducing its external costs
- Further external costs internalization
- Establishment of minimum SSS standards
- Promotion of strategic SSS routes
- Effective tool to control the SSS market
- Upgrade SSS image
- Further promotion by the EU of sustainable means of transport

#### Threats

- Enlargement and modernization of road infrastructure
- Performance improvement of road transport vehicles
- Social pressure from road transport sector
- Disregard and mistrust from road carriers

Current Ecobono formulas try to reach a too ambitious objective using measures which

application field does not fit at all with their objective. Leading the Ecobonos to failure.

Therefore after the SWOT analysis we concluded that an Ecobono proposal in a community basis, applicable all around the EU, will help to overcome most of the weaknesses that current Ecobonos present, besides favouring to exploit the several opportunities within reach and counter possible future threats.

### 3.3 Proposal

A common EU objective as the development of a sustainable European transport system requires global measures applied with one voice all around Europe. Rebalancing the share of means of transport is not an easy task and independent national measures will never achieve it in a sufficient way, taking into account that the scenario is formed by a single market.

Thus the proposed Ecobono formula includes the entire EU. The application field is formed by all green SSS routes calling at any port of the member states and the potential receivers of the ecological bonus are all European road carriers.

Besides aforementioned facts, a really important issue regarding to this new Ecobono formula is that each member state will contribute to the payment of the measure costs to the extent it is benefited. This benefit is calculated based on  $tm \cdot km$  avoided to each of the member states benefited by the route.

The fact that the proposed Ecobono is a common measure for the whole EU, also enables EU governing authorities to employ available legislative tools under the EU legal framework to enforce all member states to apply it.

Moreover as the bonus given to the road carrier is based in the savings that modal shift generates, there should not be budget problems. Of course the payable bonus has to be calculated for each route, being possible that the outcome for some routes is that there is no room for the Ecobono due to the little or inexistent difference in externalities compared to road transport.

<b>Issuing authority:</b>	European commission
<b>Definition</b>	Ecological bonus given to the carrier in exchange for using Short Sea Shipping
<b>Receiver:</b>	European road carriers
<b>Budget:</b>	Non defined
<b>Minimum trips:</b>	0
<b>Bonus:</b>	To determine depending on the route and the number of done trips.
<b>Attached routes:</b>	Green european SSS routes

Table 5. Main characteristics of the proposed community Ecobono. Source own.

Finally regarding the minimum number of done trips or transport units shipped, either trailers or containers, we consider that this must not be a limiting issue. Due to the fact that since the very first moment that a small road carrier decides to ship its trailer or container in a SSS route in which the Ecobono is in place, it is contributing to the overall objective of rebalancing means of transport within the current transport system. On the other hand, we do think that further usage of SSS must be promoted offering higher subventions to those using SSS more frequently.

### 3.4 Examples

In the following paragraphs two examples of the introduced Ecobono formula are presented so as to show the methodology used to fairly share measure costs among favoured member states.

The selected SSS routes are part of the Motorway of the Sea of western Europe (Bilbao-Zeebrugge) and the Motorway of the Sea of the south-west Europe (Barcelona-Civitavecchia). Currently the SSS route between Bilbao and Zeebrugge, by the Basque Government, and previously the route between Barcelona and Civitavecchia, by the Italian Government, have been destiny of the ecological bonus. This will help us in the comparison between current and proposed Ecobono formulas.

SSS route	Bilbao-Zeebrugge
<b>Distance (sea):</b>	677 nm
<b>Distance (by road):</b>	1221 km
<b>in Spain:</b>	119 km (10%)
<b>in France:</b>	1031 km (84%)
<b>in Belgium:</b>	71 km (6%)

Table 6. Distances in the Bilbao-Zeebrugge route. Source own.

SSS route	Barcelona-Civitavecchia
<b>Distance (sea):</b>	445 nm
<b>Distance (by road):</b>	1274 km
<b>in Spain:</b>	160 km (13%)
<b>in France:</b>	533 km (42%)
<b>in Italy:</b>	581 km (46%)

Table 7. Distances in the Barcelona-Civitavecchia route. Source own.

The comparison of external costs between road transport and SSS for the feasibility of the examples not been the issue of this paper, this fact is taken for granted.

Thus the real important characteristics of the selected routes are the ones presented above, that is the sharing out of distances among the involved countries.

For instance if the volume of freight that a SSS route is able to shift from road to sea is of 1 million metric tones, each of the routes will benefit in the following way to the above listed countries:

SSS route	Bilbao-Zeebrugge
<b>Volume per year</b>	1 000 000 tons
<b>Avoided tons*km</b>	1 221 000 000
<b>in Spain:</b>	122 100 000 tons*km (10%)
<b>in France:</b>	1 025 640 000tons*km (84%)
<b>in Belgium:</b>	73 260 000tons*km (6%)

Table 7. Share out of benefits by country due to the Bilbao-Zeebrugge SSS route. Source own.

SSS route	Barcelona-Civitavecchia
<b>Volume per year</b>	1 000 000 tons
<b>Avoided tons*km</b>	1 274 000 000
<b>in Spain:</b>	152 880 000 tons*km (13%)
<b>in France:</b>	535 080 000 tons*km (42%)
<b>in Italy:</b>	586 040 000 tons*km (46%)

Table 7. Share out of benefits by country sue to the Barcelona Civitavecchia SSS route. Source own.

Therefore after these examples we think it is crystal clear that a common measure to all member states which force them to contribute to the extent they are benefited is necessary.

## 4 Results

Once the examples have been studied and taking into account the previous SWOT analysis, the following are the findings we have reach about a European Ecobono:

- It overcomes part of current weaknesses opening the measure to all European carriers and SSS routes.
- It removes unfair competition among carriers.
- Budget problems are eliminated, because each country contributes to the payment of the measure in so far as it is benefited
- The proposed measure also contributes in the establishment of common and minimum standards for SSS services as improving its image.
- The new Ecobono serves as a tool both to control the market and to promote SSS strategic routes.
- Promotes further enlargement of road transport companies, encouraging them to consolidate joint ventures with other European road carriers.

To sum up we certainly think that such a measure is far more efficient and hence feasible than the one in place nowadays. Therefore we are convinced that it could substantially contribute in the rebalancing of the European transport system.

## 5 Conclusion

The scope and objectives of current Ecobono formulas call for a joint measure within the EU. In this case actions taken by individual member states present serious weaknesses turning those measures vulnerable and inefficient. Therefore we consider that current Ecobono formulas should be rethought and be proportionate to their objectives.

The presented European Ecobono formula overcomes most of the weaknesses and exploits many of the identified opportunities for SSS services.

Besides, the proposed Ecobono completely coincides with the European transport policy. It promotes intermodal transport taking advantage of its overall better performance than unimodal transport as it uses means of transport taking into account their comparative advantages. Thus achieving also a rebalance of means of transport within the European transport system if prove successful.

### References:

- [1] Directorate-General for Energy and Transport, Energy and Transport in figures, Brussels, 2010.
- [2] Directorate-General for Transport, COM (95) 691, Green Paper – Towards Fair and Efficient Pricing in Transport Policy – Options for internalising the external cost of transport in the European Union, 1995.
- [3] European Commission, Environment, <http://ec.europa.eu/environment/air/transport/road.htm>, access date: 05/06/2010.
- [4] Lloyd, M. and Vasallo, W. Regional Action for Logistical Integration as Shipping across Europe (REALISE). 2005.
- [5] Cabinet council of the Italian Republic, Minister Act, 26/03/2007.
- [6] Official Bulletin of the Basque Country, 3/09/2009.
7. The European Parliament and the Council of the European Union, DI/2005/33/EC, 2005.
8. International Maritime organization, MARPOL ANNEX VI: Prevention of air pollution from ships, 1997.
9. European Commission, European transport policy for 2010: time to decide, 2001.
10. European Commission, Keep Europe moving: a transport policy for sustainable mobility, 2006.