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## **METHODS OF PROMOTING INTERMODAL TRANSPORT DEVELOPMENT IN THE FEDERAL REPUBLIC OF GERMANY, FRANCE AND ITALY IN YEARS 1990-2016 – CONCLUSIONS FOR POLAND**

**Summary.** The purpose of this paper is to show directions for promoting alternative modes of transport in Europe and Poland in order to limit the dynamic growth of road transport. The recommendations of the European Commission in relation to the development of intermodal transport are discussed. The structure and size of intermodal transport in Europe are presented. An attempt is made to determine the forecast of intermodal transport in Poland. The basic undertakings determining the development of intermodal transport in Poland are indicated. On the basis of the experience of selected Western European countries, general conclusions regarding the development of intermodal transport in our country are formulated.

### **1. INTRODUCTION**

The European Union's policy aims at balancing individual modes of transport through increasing the role of rail and waterways transport by means of development and support of appropriate infrastructure. A major obstacle to the implementation of this policy is the lack of a centralized governing structure in EU countries that would act as an organizer and manager of intermodal transport operations, which is obvious due to the need to observe the principles of free and fair competition. The effective development of intermodal transport is seen in coordinated actions of Member States, consisting of the actual promotion of environment-friendly modes and technologies of transport, including, in particular, railways, water transport and the combination of both where possible. All these should be considered under the condition that every manufacturing enterprise, service company, or transporter wants to be successful [1]. In the same time, a recent report from 2018 of Millions Insight shows that the factors responsible for logistics market growth include rise in rail transport coupled with a significant rise in import and export [9].

The European Union is undertaking a series of actions, both legislative and initiating (including financing), aimed at supporting the development of intermodal transport in Europe, being aware that it brings with its indisputable environmental benefits, increasing traffic safety and relieving roads from parts truck traffic.

### **2. METHODS OF SUPPORTING INTERMODAL TRANSPORT BY THE EU**

According to the European Commission, achieving significant structural changes in the freight market in accordance with the recommended principle of sustainable transport development will be possible through the implementation of, among others, the following measures:

- common implementation of ICT (information and communication technology) in freight transport logistics: e-Freight (electronic transport system) or ITS (intelligent transport systems), which will enable the improvement of the identification system and tracking the flow of cargo along the entire transport route using various means of transport, and improving communication between transport companies and public administration;
- ensuring railway interoperability in the international system by eliminating technical and operational and organizational bottlenecks in freight rail transport;
- simplifying administrative procedures by integrating information technology of offices (e.g. in the case of customs or creating a single transport document) and creating the so-called one window;
- standardization of vehicle load and dimension standards, and the European integrated cargo unit standard for all types of surface transport through appropriate changes to EU regulations;
- creation of "green corridors" with the use of short sea shipping, rail, inland waterway and road transport, on which transshipment nodes equipped in the future with environmental-friendly solutions would be located [11].

Despite the support of the European Union, railways without any external assistance will not be competitive for road transport. EU experts<sup>1</sup> emphasize that railways will not become a modern mode of transport unless conditions for full and real liberalization are created, as well as if rail transport, and consequently the combined one, does not receive the necessary help.

The policy of the European Commission in the years 2003–2016 focused on reducing the volume of road traffic and increasing intermodal transport. During this period of the Marco Polo program, the effects of the transport system in the environment have improved (mainly reducing the external costs of transport). In 2014–2020, a new financing perspective for freight transport services was launched. It takes into account new technological developments (i.e. developments in information and communication technologies (ICT)), experience gained during the Marco Polo program and the new transport policy framework set, inter alia, in the revised guidelines for trans-European transport networks. In 2011, the European Parliament adopted the "Connecting Europe" financial instrument [3], which aims to increase economic growth, thus increasing the effectiveness of European Union activities by striking a balance between policies pursued in the EU Member States in the fields of transport, energy and telecommunications.

The new financing plan allows for the acceleration of long-term investments involving the construction of roads, rail connections, energy infrastructure and fast telecommunications connections. It also supports greener modes of transport and the use of energy from renewable sources – in line with the EU's strategy for growth and jobs, Europe 2020. The funds provided for financing projects implemented under this program amount to EUR 29.3 billion (including support planned for Poland for the development of intermodal transport in the amount of PLN 72.5 million) and are managed directly by the European Commission. In the field of transport, the resources derive from the Cohesion Fund. They are to be primarily intended for the implementation of the core network of the trans-European transport network (TEN-T), and therefore priority transport axes, including road ones, in the entire European Union. It should be mentioned that the intermodal transport network is part of the TEN-T network. It includes linear and point infrastructure enabling transport and transshipment of intermodal transport units. Point infrastructure is primarily made up of land and sea intermodal terminals (mainly container ones) and logistics centres.

The types of financial assistance provided for intermodal transport from EU and national funds in selected Western European countries are presented below.

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<sup>1</sup> See, for instance, Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area.

## 2.1. Methods of Supporting Intermodal Transport in Germany

The German government has been supporting the intermodal transport system since 1998 in the form of financial incentives for the transfer of goods to rail and water transport [2]. In January 2012, the Federal Ministry of Transport amended the rules on the promotion of intermodal transport, so that the licensing and financial assistance procedures were more transparent and helped to reduce bureaucracy. Taking into account better planning of investments by companies applying for support and increasing their safety on the market, the financing period was planned for four years (the previous one was 3 years).

Subsidies are granted, as before, for the construction of new and surface development of existing transshipment facilities located in private areas of terminals for combined transport. Financing has been extended by rail–rail layout on transshipment facilities in inland waterway ports, which in future will contribute to better organization of transloading goods in the intermodal transport chain. The current level of financing for supporting new technologies for intermodal transport has been slightly reduced (by 5%).

The Federal Ministry of Transport also developed a report for the development of intermodal transport in Germany until 2025. This report will be helpful for licensing authorities (in the field of rail transport, inland waterways, and marines) in making decisions on providing financial aid for investments that will cause the transfer of existing transport potential to ecological forms of transport. The forecasts of regional competitive intermodal transport areas in Germany were created on the basis of the existing network of terminals and the size of traffic flows [2].

## 2.2. Methods of Supporting Intermodal Transport in France

The state policy assumes for the years 2014–2020 further support for projects concerning the development of river ports; however, priority is given to investments focused on supporting combined transport. At the same time, the promotion of intermodal transport, which is an alternative to road transport over long distances, is assumed. Thus, the complementarity of forms of inland waterway transport, sea transport combined transport, rail transport, etc., will be strengthened. The activities undertaken are part of the policy to reduce greenhouse gas emissions. The implementation of environmental tax (so called heavy vehicle transit tax) on heavy road vehicles since 2014 has also been planned.

Financial resources for the development of intermodal transport are divided depending on whether they relate to transport using railway lines (support for control, monitoring and security of transport), or the river and sea sector.

For loans with intermodal rail transport, the State allocated EUR 16.5 million, whereas EUR 7.6 million was foreseen for support for intermodal maritime and inland waterway transport. The conditions for granting financial aid are the same for all operators [17].

Investment, modernization and development projects will be supported from public funds. Financial assistance will be earmarked, among others, on the following:

- continuation of modernization and reconstruction of the river system;
- preparation of new motorways of the sea;
- further support for the national rail network GSM-R (Global System for Mobile Communications for Railways – Railway GSM Network – a digital communication system based on the GMS standard, designed to provide communication (sound communications) between employees of companies involved in transport by rail), as well as financing programs to ensure traffic safety in road and rail tunnels.

## 2.3. Methods of Supporting Intermodal Transport in Italy

In Italy, the basis for granting financial aid for intermodal transport is the Act of 1990, which was amended in 1995, specifying the following:

- rules and criteria for providing assistance,
- financial assistance for the implementation of transshipment points at the interface between various modes of transport.

In 1990, the main railway operator (the state-owned company Ferrovie dello Stato – FS) received a loan of EUR 500 million for the modernization of freight transport.

A large-scale undertaking was to build a kind of "cargo villages" (Interporti), well equipped with transshipment equipment for classic and intermodal transport, and shipment tracking systems. Interporti were located in places such as Bari, Ferruccio, Parma, Turin, Milan, Verona, Padua, Rivalta Scrivia, Bologna, Leghorn and Naples.

In 1991, the Italcontainer company (later acquired by CEMAT) was established to carry out intermodal transport.

Important relations in this type of transport take place on the following routes:

- Bologna Corticella–Le Havre,
- Milan-Smistamento–Rotterdam.

Financial assistance is granted by the state from the budget in the form of the following:

- subsidies,
- low-interest loans,
- loan guarantees,
- interest-free loans for the purchase of specialized wagons for intermodal transport units.

Financial aid is provided to the following:

- railways,
- intermodal transport operators,
- terminal operators.

### 3. INTERMODAL TRANSPORT IN EUROPE

The basis for the success of intermodal transport operators is the proper cooperation of rail and road transport. The leading role in organizing intermodal transport is played by UIRR (International Union of Intermodal Transport Vehicles Ra-Ro). All UIRR activities are aimed at facilitating their members' access to the intermodal market throughout Europe. In addition, the organization is a coordinator in the field of research and innovation projects developed under the EU support programs.

On the basis of UIRR reports for the years 1990–2015, in tables 1–2 and in Figure 1, selected volumes of intermodal transport are provided by 18 national operators (as at the end of 2016) associated with UIRR. It should be noted that in order to avoid double counting in UIRR statistics, only the number of shipments assigned in domestic and international traffic by operators associated with UIRR is given. It should be also remembered that about 90% in unaccompanied intermodal traffic is carried by containers [10]. These statistics show significant rise in volume of both international and national transport carried by intermodal transport operators between 1991 and 2016. These statistics also show the dynamics of intermodal transport with increasing use of containers and swap-bodies as well as Ro-La and the decreasing use of semi-trailers over time.

### 4. INTERMODAL TRANSPORT FORECASTED FOR POLAND

The increase in global trade and, as a result, rise in global container transport provide good prospect for the development of intermodal transport in Europe and Poland, especially with the use of rail transport and handling transport to and from seaports. It is estimated that intermodal railway transport in Poland will increase in the next few years at the rate of several dozen percent per year [20], whereas the growth rate will depend on many factors (including economic situation and pro-development activities).

Table 1

The volume of transport of European intermodal transport operators – associated with UIRR  
(number of consignments and transport work) [19, 21]

Years	Transport in Total		International transport		Domestic transport
	Number of shipments	mln tkm	Number of shipments	mln tkm	Number of shipments
1990	1,183,361	18,677	543,610	11,708	639,751
1995	1,615,364	24,970	968,910	17,720	646,454
2000	1,964,439	32,486	1,287,922	24,330	676,517
2002	1,982,906	33,074	1,302,253	25,027	680,653
2004	2,343,254	34,511	1,426,693	26,173	916,561
2005	2,457,579	36,957	1,551,380	28,871	906,199
2006	2,717,751	45,394	1,794,434	35,558	923,317
2007	2,937,542	46,069	1,916,808	36,273	1,020,734
2008	2,994,625	45,971	1,897,358	35,722	1,097,267
2009	2,818,349	38,898	1,614,935	30,455	1,203,414
2010	3,030,865	42,366	1,759,815	33,238	1,271,050
2011	3,214,167	44,710	1,932,821	36,080	1,281,346
2012	2,724,795	40,801	1,707,302	32,500	1,017,493
2013	2,645,950	40,740	1,721,656	32,200	924,294
2014	2,617,886	52,170	1,720,722	37,275	897,165
2015	2,840,760	54,980	1,902,330	45,800	938,430
2016	2,895,567	56,650	1,949,981	47,950	945,586

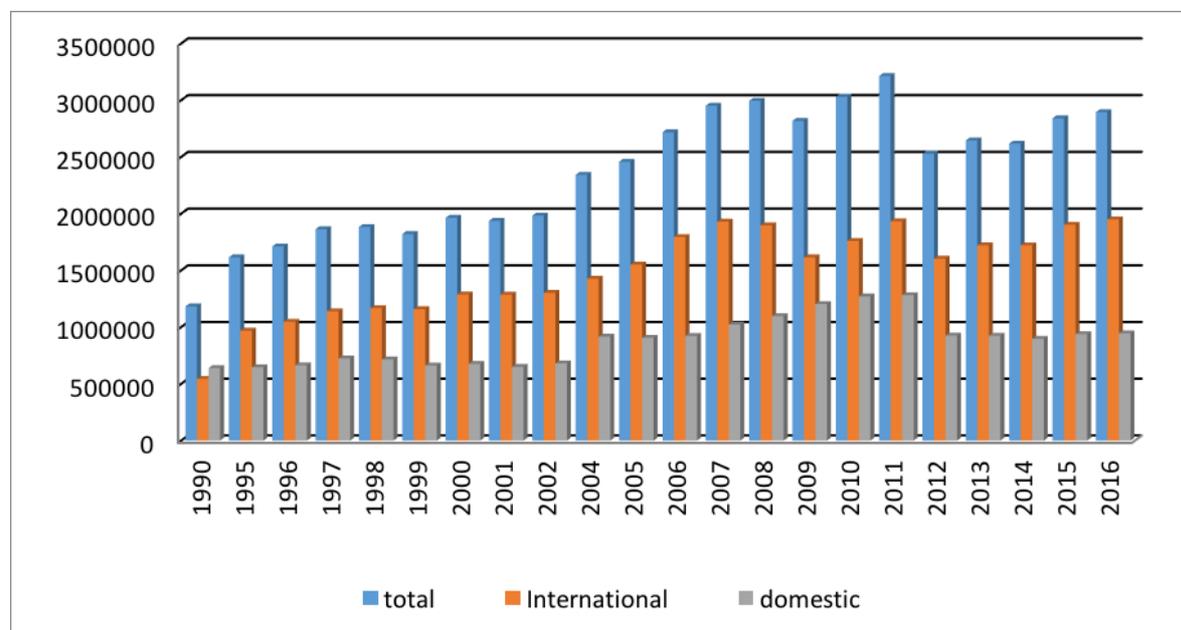


Fig. 1. The volume of intermodal transport of UIRR companies, by the number of shipments [19, 21]

Table 2

Transport structure by intermodal units [19, 21]

Years	Containers and Swap bodies		Ro-La (Rollende Landstraße)		Semi-trailers
	Number of units in thousand	Share in %	Number of units in thousand.	Share in %	Number of units in thousand
1990	727	62	214	18	242
1995	1,079	67	312	19	224
2000	1,333	68	460	23	172
2005	1,978	80	316	13	164
2007	2,341	79	389	13	220
2008	2,319	78	429	14	247
2009	2,183	78	416	14	220
2010	2,282	75	448	15	301
2011	2,463	77	426	13	324
2012	2,243	78	398	14	245
2013	2,134	81	375	14	136
2014	2,101	80	362	14	154
2015	2,312	81	382	13	145
2016	2,301	81	460	20	135

Polish intermodal transports are based mainly on the use of land transport, which accounted for nearly 70.1% (according to transport performance). The share of transport through seaports is still small – in 2015, it amounted to approximately 29.9% [1].

It is estimated that by 2020, transport performance of intermodal transport may exceed the level of 10% of the transport market, and in terms of mass, 6%. However, this is conditioned by the financial support for the development of container transport. If rail transport support activities are not quickly taken up, their share in the Polish transport market may continue to decline, and in 2020, it will decrease to 10% [1].

## 5. UNDERTAKINGS DETERMINING THE DEVELOPMENT OF INTERMODAL TRANSPORT IN POLAND

The development of intermodal transport in Poland is favoured by good geographical location of the country and a relatively high density of railway line infrastructure (6.6 km of railways per 100 km<sup>2</sup>). However, the share of intermodal transport in the Polish railway market is still very low. An obstacle to the development of intermodal transport in Poland is unfavourable economic conditions (high costs or prices for transport services). The most unprofitable is transport for short distances. As regards the share of intermodal transport in the railway market (measured by transport work), Poland is one of the last places among European countries. In most countries, this share exceeds 10% (and in some countries even 35%), whereas the EU average share in 2015 was 16.6% (Fig. 2).

However, the dynamics of intermodal transport in Poland is among the highest in European Union countries.

In the years 2004–2008, the increase in transport measured by the work carried out was almost 130%, and in 2009–2010, it was about 30%, with the average dynamics in European countries at the level of 10.8% [3]. In 2012, the modal railway transport transported about 32.5% of containers (with loads and empty), which was higher as compared to 2011, with over 73% of these transports being carried out in international transport. However, the number of transported swap body car bodies was 13.0% lower than in 2011 [20].

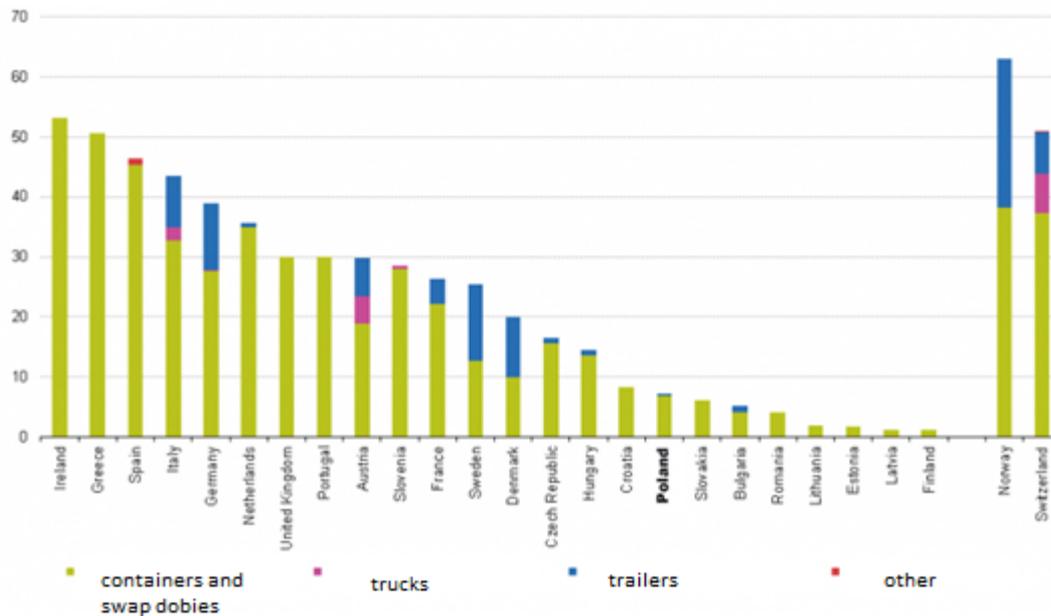


Fig. 2. The share of intermodal transport units in the railway market in 2015 by transport work [6]

In 2015, the share of intermodal transport in the rail transport market, measured by the weight of loads, reached the level of 4.6% and was higher by 0.4 percentage point than in 2014. In the work carried out, intermodal transport accounted for 7.4% – increase in share by 0.6 percentage point as compared to 2014 [1]. However, in 2016, the share of intermodal transport in the rail transport market, measured by the mass of transported loads, reached the level of 5.8% and was higher by nearly 1.2 percentage point than in 2015. The number of transported intermodal transports of units increased as compared to 2015 by over 27% and the number of TEUs by almost 25%. The weight of cargo in intermodal transport increased by 2.4 million tonnes, compared to 2015, from 10.4 million tonnes to 12.8 million tonnes [15].

The development of intermodal transport in Poland requires the following intermodal operators and railway undertakings to take action [20]:

- ensuring scheduled transit times for intermodal trains;
- monitoring connections and providing current information on shipments for customers;
- implementation of comprehensive information systems in land and land–sea intermodal transport chains;
- implementation of innovative reloading technologies in intermodal terminals;
- flexible pricing and rebate policy for intermodal operators and rail carriers;
- conducting more effective marketing and promotion of intermodal transport services;
- cooperation with local and regional authorities in the area of shaping terminal infrastructure.

## 6. CONCLUSIONS

The potential for the development of intermodal/combined transport in Poland is the creation of favourable technical, organizational and legal, as well as economic and financial environment. The experience of Western European countries indicates that to align the current distance between intermodal transport in Poland and the average EU level, the following measures are needed [20]:

- development and implementation of the prospective Program for the Development of Intermodal Transport by 2020;

- drafting a draft law on intermodal transport, which would regulate the basic issues concerning the transport system in Poland in a comprehensive manner and give statutory delegations for the Minister of Transport and the Minister of Finance to issue relevant implementing regulations;
- preparation of a legal act on granting financial aid for intermodal transport, which should contain detailed conditions, criteria and principles for granting state financial aid as well as the size and structure of the aid and its allocation;
- creating an Intermodal Transport Fund for supporting the development of this transport system;
- encouraging financial support from public investment in intermodal terminals and logistic centres, as well as the introduction of tax breaks for investors and facilitating the widest possible use of EU assistance in this area;
- supporting property investments in specialized rolling stock and intermodal units, by guaranteeing low-interest loans for entrepreneurs for such investments.
- releasing road carriers performing transport of intermodal transport units in intermodal transport chains from fixed road tolls and tax on means of transport;
- creating a legal basis for using environmental protection funds to promote the development of intermodal transport system.
- prohibiting traffic on roads, throughout the country, including vehicles and combinations of vehicles with a maximum permissible weight exceeding 12 tonnes on all weekend days and exemption from this prohibition for vehicles transporting to/from intermodal terminals, and maintaining existing traffic bans;
- tightening the control of road vehicles on the eastern border of Poland, primarily in the field of vehicle weight and emission standards.
- improving the image of intermodal transport by conducting a broad information campaign and promoting its development, with particular emphasis on social benefits (aspect of environmental protection and human health and life) of this transport system as an alternative to road transport.

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