

# Private financing of rolling stock

Market analysis for Western and  
Eastern Europe



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## A. Objective, scope and proceeding



# The study was conducted in order to assess the magnitude of private financing in funding rolling stock projects in Europe

## Objectives and Procedure

### Objectives

- > Determine **absolute** and **relative** importance of private financing in funding rolling stock projects, focusing on
  - Different product categories (High-speed Trains, Multiple Units, Locomotives, Wagons and Urban Systems)
  - Aggregated European market and major submarkets including Germany, France, Poland, Turkey, the United Kingdom, and Italy



### Procedure

- > Analysis of **370 rolling stock projects** in the years 2011-2013 in **19 countries**
- > Assessment as publicly or privately financed was made depending on the ownership structure of the procuring entity
  - All purchases made by publicly held entities were considered as public finance due to state funding and explicit or implicit state guarantees
  - In case specific project-based financing information was available and revealed private financing portions, this private financing portion was considered accordingly even if the procuring entity is publicly held
  - Joint Ventures were considered private to the extent of the private party's share in the Joint Venture
  - Procurements made by privately held entities were considered as privately financed

# UNIFE Product categories were assigned to five subsets according to their main purpose of application

## Scope – Product Categories

<b>High Speed</b>	<ul style="list-style-type: none"> <li>&gt; Very High Speed Trains (&gt; 250 kph)</li> <li>&gt; High Speed Trains (220 – 250 kph)</li> </ul>
<b>Multiple Units</b>	<ul style="list-style-type: none"> <li>&gt; DMUs (<math>\leq</math> 160 kph)</li> <li>&gt; DMUs (161 – 219 kph)</li> <li>&gt; EMUs (<math>\leq</math> 160 kph)</li> <li>&gt; EMUs (161 – 219 kph)</li> </ul>
<b>Urban Systems</b>	<ul style="list-style-type: none"> <li>&gt; Light Rail Vehicles (LRV)</li> <li>&gt; Metro Vehicles</li> <li>&gt; Automated Systems</li> </ul>
<b>Locomotives</b>	<ul style="list-style-type: none"> <li>&gt; Electric Locomotives</li> <li>&gt; Diesel Locomotives (incl. Shunters)</li> </ul>
<b>Coaches / Wagons</b>	<ul style="list-style-type: none"> <li>&gt; Coaches – Single Deck</li> <li>&gt; Coaches – Double Deck</li> <li>&gt; Wagons (Freight)</li> </ul>

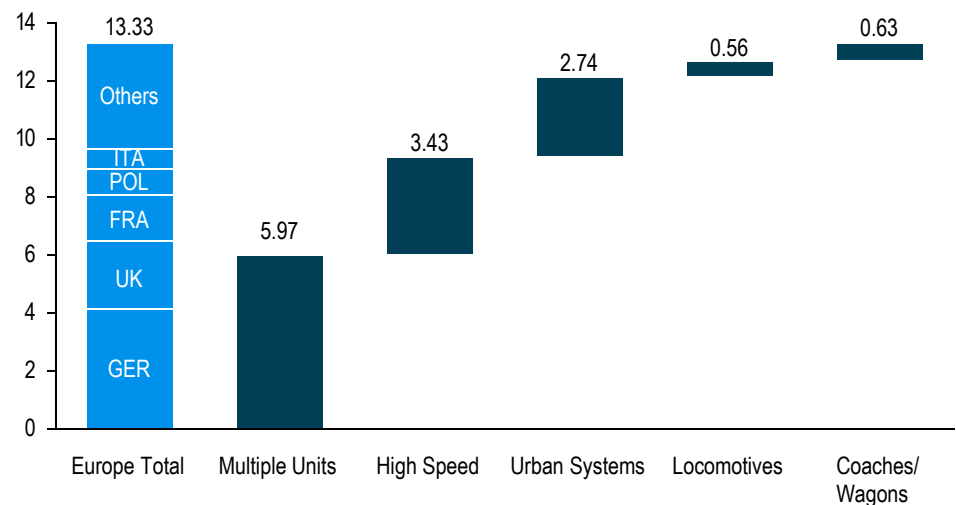
# Our project database provides an adequate coverage of the total European market volume

## Geographic scope and market volume by product category



- > Of the average annual market volume of EUR 13.33 bn for Western and Eastern Europe, according to UNIFE's World Rail Market Study 2014, an aggregate volume of EUR 11.87 bn (89 %) has been classified as publicly financed according to the customers financial structure
- > Of the 370 rolling stock projects analyzed, 84 (23 %) were in Germany, 74 (20 %) in Poland, 39 (11 %) in France, 37 (10 %) in Italy, 22 (6 %) in the United Kingdom, and 114 (30 %) in other countries
- > Average market volume per project was approx. EUR 96 million

Average annual market volume by product category, 2011 – 2013 [EUR bn]



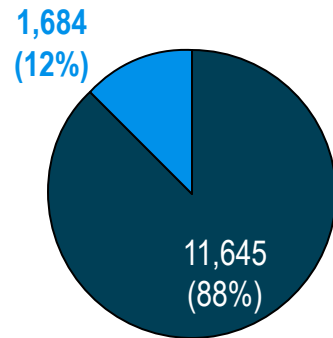
## B. Key findings



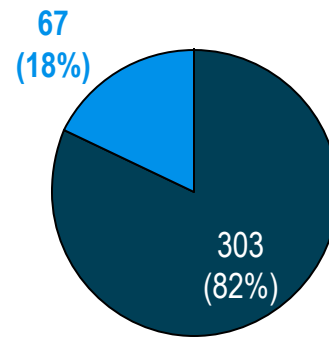
# Private financing accounts for 12% of European rolling stock order volume

## Overall Results of private financing shares

by Volume [EUR m]

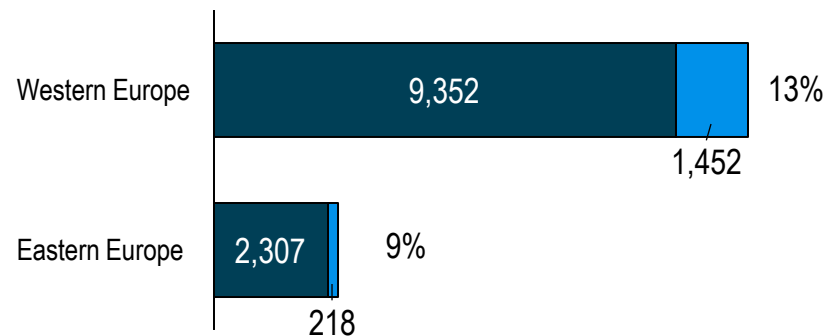


by # projects



- > Whereas private financing accounts for about 12% (EUR 1.68 bn) of total market volume, **18% of all projects are related to private financing** either to full extent or partly in Joint Ventures
- > Private financing is comparatively **important in the United Kingdom** (46%), **the Netherlands** (19%), **Turkey** (18%), **Germany** (9%) and **Italy** (9%), even though its share overall is rather low

by region [EUR m]



- > Private financing has considerable importance in the acquisition of **Locomotives** (31% share), **EMUs and DMUs** (17%) as well as **Coaches and Wagons** (44%)
- > In **Western Europe** all product categories are **partially privately** financed, even though multiple units clearly are the product category with the highest private financing portion
- > In **Eastern Europe** private financing is only relevant for purchases of **Locomotives** as well as **Coaches and Wagons**



# Private financing does have considerable impact for multiple units, locomotives and wagons

## Key findings of detailed analysis

- |                           |   |
|---------------------------|---|
| <b>1 High Speed</b>       | <ul style="list-style-type: none"> <li>&gt; VHS and High Speed Systems is <b>largely dominated by publicly financed players</b> such as state owned rail companies and public authorities</li> <li>&gt; <b>One partially privately financed project</b> has been observed in recent years</li> </ul>              |
| <b>2 Multiple Units</b>   | <ul style="list-style-type: none"> <li>&gt; Representing 59% of the total private financing market volume, Multiple Units is by far the <b>most important single product category</b> for private financing</li> <li>&gt; A total of 26 projects with a share in private financing have been conducted</li> </ul> |
| <b>3 Urban Systems</b>    | <ul style="list-style-type: none"> <li>&gt; As most urban transport systems in Europe are exclusively operated by public enterprises, the <b>share of private financing is very low</b> (&lt;1% by volume)</li> <li>&gt; A total of 3 projects with a share in private financing have been conducted</li> </ul>   |
| <b>4 Locomotives</b>      | <ul style="list-style-type: none"> <li>&gt; With a share of 31% by volume and 57% by number of projects, <b>private financing of rolling stock is well established in the Locomotive sector</b></li> <li>&gt; A total of 26 projects with a share in private financing have been conducted</li> </ul>             |
| <b>5 Coaches / Wagons</b> | <ul style="list-style-type: none"> <li>&gt; Whereas Coaches are mainly publicly financed, <b>private financing is dominant in the Wagon sector</b></li> <li>&gt; A total of 9 projects with a share in private financing have been conducted</li> </ul>   |

# A clear correlation between the liberalization of market segments and the extent of private financing can be observed

## Market liberalization and private financing

- » The two market segments** with the highest degree of liberalization display the highest share of private financing
  - > Multiple units are mainly ordered for regional transport which in several European countries is gradually liberalized (e.g. Germany, Netherlands, Sweden, U.K.)
  - > Locomotives are predominantly ordered for freight traffic – a market segment that has been liberalized across Europe
  - > Freight cars also show a high share of private financing
  
- » Regulated market segments** show low share of private financing
  - > High-speed traffic dominated by state-owned railways with access to cheap capital because of excellent ratings
  - > In urban transport, the public transport companies owned by the cities, generally order vehicles without private funding

As public funding is limited and rail traffic will be further liberalized, we expect significant growth of private financing

## Expected development

### Deregulation of rail transport

- > Further liberalization of regional rail transport in Europe expected (additional countries, greater market shares of private railways)
- > Private players will also slowly emerge in long-distance passenger transport
- > Rail cargo will continue to be characterized by many private players

### Scarcity of public funds

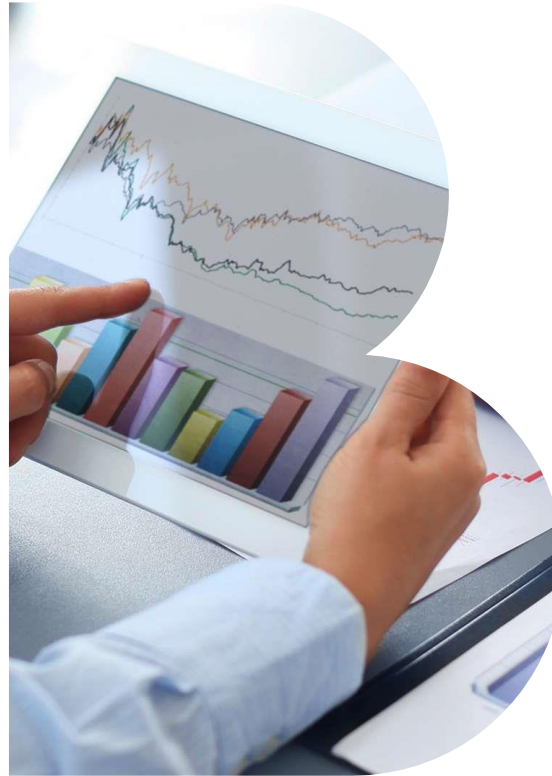
- > Continuing budget problems of public sector in most European countries – on all levels (federal, state, regional/municipal)
- > End of period with extraordinarily low interest rates will exacerbate the problem

### Advantages of private financing

- > Enlarges the pool of available funding for rail transport
- > Creation of additional incentive for higher customer/market orientation and efficiency of operators

**Significant growth of private financing**

## C. Results by region and segment



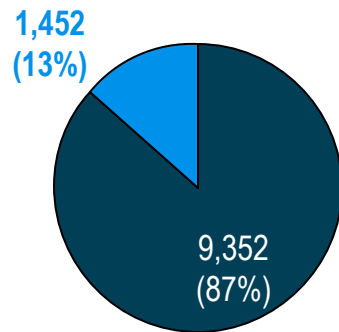
## C.1 Western Europe



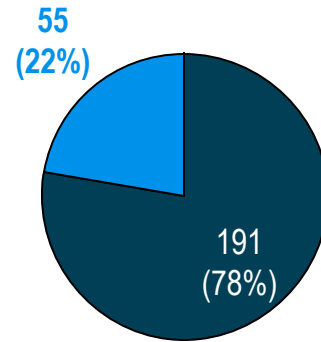
# Private financing accounts for about EUR 1.45 billion in Western European rolling stock volume

## Western Europe results of private financing shares

by Volume [EUR m]

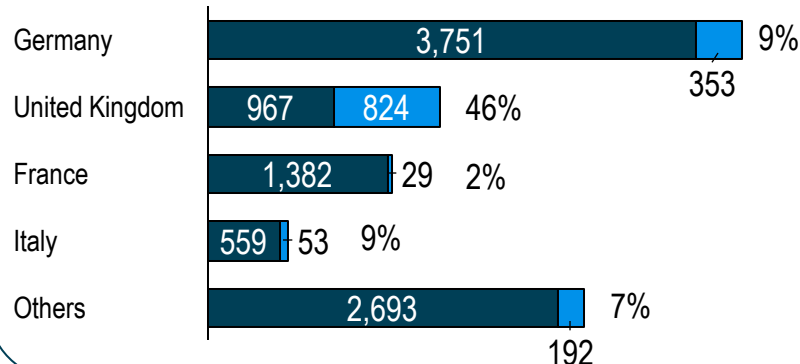


by # projects

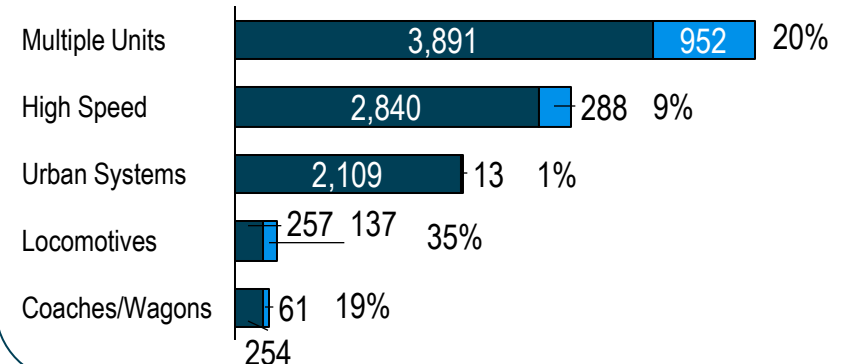


- > Whereas private financing accounts for about 13% (EUR 1.45 bn) of total market volume, **22% of all projects are related to private financing** either to full extent or partly in Joint Ventures
- > **Germany** and the **United Kingdom** are the major markets for private financing in rolling stock, representing 81% of the aggregated private financing volume in Western Europe
- > Private financing has considerable importance in the acquisition of **Locomotives** (35% share), **EMUs and DMUs** (20%) as well as **Coaches and Wagons** (19%)

by region [EUR m]



by product category [EUR m]

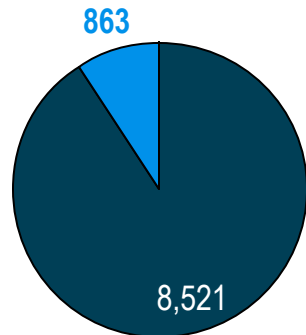


Private finance  
Public finance

# The area of High Speed rolling stock projects is largely dominated by public customers

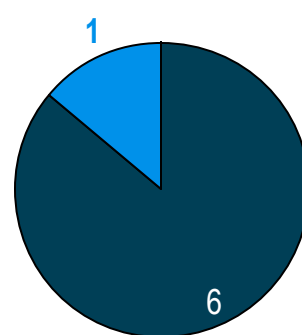
## Detailed results High Speed Trains<sup>1)</sup>

by Volume [EUR m]



■ Private finance ■ Public finance

by # projects



- > High Speed rolling stock comprises the product categories "VHS" (EUR 2,024 m) and "High Speed Trains" (EUR 7,360 m)
- > Major customers of High Speed rolling stock are typically **state-owned rail companies** such as Deutsche Bahn, SNCF or SBB
- > The Department for Transport's **East Coast Line** project is a public-private partnership with a **private financing portion** – the only project in this segment with a private financing share
- > The segment is characterized by **few orders of very large scale** with an average contract size of EUR 1,226 m

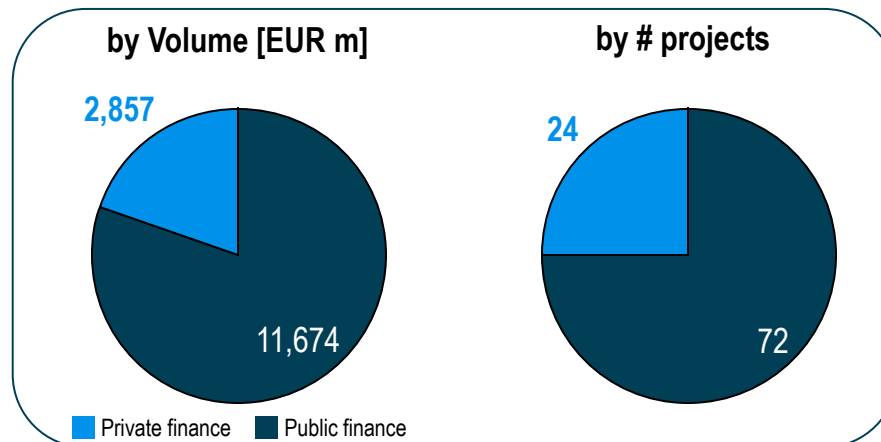
### Key projects (overall market)

	Country	Project name	EUR m	privately financed
Deutsche Bahn	GER	ICx	4,754	-
Department for Transport	UK	East Coast Line	1,580	partially
SNCF	FRA	HGV Trains	1,200	-
Eurostar	UK	Velaro Trains	617	-
SBB	CH	Pendolino Trains	203	-

1) Market volumes shown here are overall volumes for the 2011-2013 period. They correspond to the average annual market volume as shown on p. 14 of this document

# Multiple units are among the core product for private financing activities in Western Europe

## Detailed results Multiple Units<sup>1)</sup>



- > Multiple Units comprises the product categories "DMUs" (EUR 2,647 m) and "EMUs" (EUR 11,884 m)
- > With a total share of EUR 2,857 m, Multiple Units are the **most important** single product category for private financing
- > The main focus of private financing activities in the Multiple Unit segment are **small to mid-size projects**
- > Private financed Multiple Units mostly operate on secondary rail services

### Key projects (overall market)

	Country	Project name	EUR m	privately financed
Transport for London	UK	Thameslink Route	1,891	partially
RATP	FRA	70 Doubledeck EMUs	1,000	-
ÖBB	AUT	100 Desiro ML ECU	557	-
DB Regio	GER	90 BR 430 trains	500	-
Stockholm (SL)	SWE	46 Cordia Nordic	440	-

### Key projects (overall market, continued)

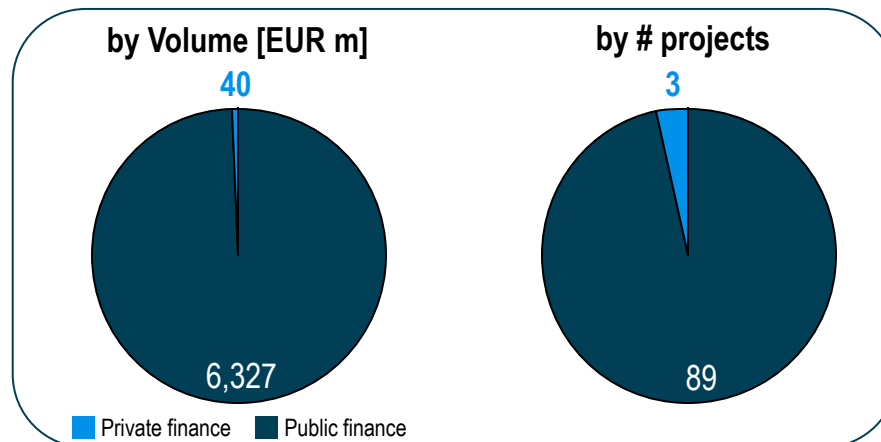
	Country	Project name	EUR m	privately financed
Netinera	GER	63 DMUs	300	partially
GOVIA	UK	26 EMUs	292	partially
Alpha Trains	GER	Stadler Flirt (EMUs)	250	fully
Southern Railway	UK	24 EMUs	207	partially
Veolia	GER	35 EMUs	200	fully

1) Market volumes shown here are overall volumes for the 2011-2013 period. They correspond to the average annual market volume as shown on p. 14 of this document



# Urban Systems are foremost operated by public enterprises

## Detailed results Urban Systems<sup>1)</sup>



- > Urban Systems comprises the product categories "Light rail vehicles" (EUR 3,359 m), "Metro vehicles" (EUR 2,914 m) and "Automated Systems" (EUR 94 m)
- > Since most local transport networks in Western Europe are exclusively operated by public bodies, the **share of private financing is rather low**
- > Privately financed purchases of Urban Systems have only been recognized in the **Cities of Nottingham (UK)** and **Montpellier (France)**

### Key projects (overall market)

	Country	Project name	EUR m	privately financed
Stockholm (SL)	SWE	96 Metro Trains	603	-
RATP	FRA	66 Metro Trains	306	-
Baseler Verkehrsbetriebe	CH	58 Light Rail Vehicles	217	-
ATM Milano	ITA	30 Metro Trains	210	-
Stadt München	GER	Metro Trains	201	-

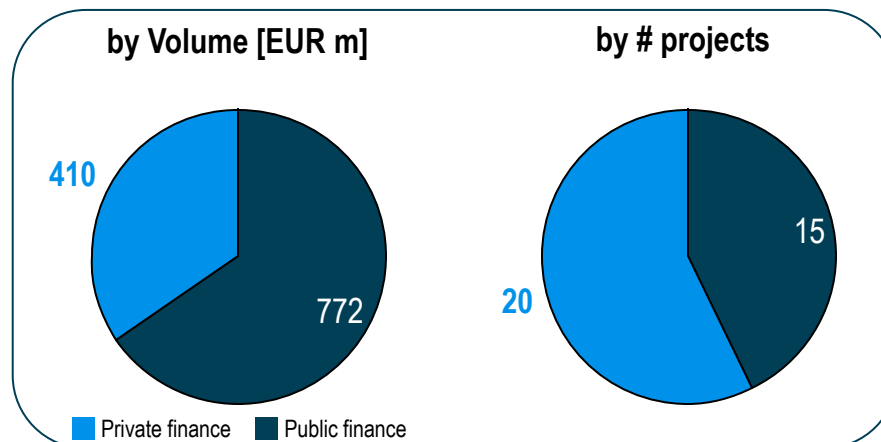
### Key projects (overall market, continued)

	Country	Project name	EUR m	privately financed
Nottingham Express Transit	UK	22 Light Rail Vehicles	57	partially
TAM Montpellier	FRA	2 Light Rail Vehicles	6	partially
British Airport Authority (BAA)	UK	Heathrow Airport	5	fully

1) Market volumes shown here are overall volumes for the 2011-2013 period. They correspond to the average annual market volume as shown on p. 14 of this document

# Private financing is very widespread in the locomotive sector of Western Europe

## Detailed results Locomotives<sup>1)</sup>



- > Locomotives comprises the product categories "Electric Locomotives" (EUR 851 m) and "Diesel Locomotives" (EUR 331 m)
- > With a share of 35% regarding sales volume, **private financing has significant relevance** in the Locomotive sector, being the **second largest single market**
- > Most privately financed projects in Locomotives can be characterized as **mid-size** purchases

### Key projects (overall market)

	Country	Project name	EUR m	privately financed
VR Group	FIN	Electric Locomotives	300	-
LKAB	SWE	Electric Locomotives	67	-
AKIEM	FRA	15 TRAXX E-LoCo.	66	-
Nederlandse Spoorwegen (NS)	NED	E-Locs for IC service	61	-
MRCE Dispolok	GER	Electric Locomotives	51	fully

### Key projects (overall market, continued)

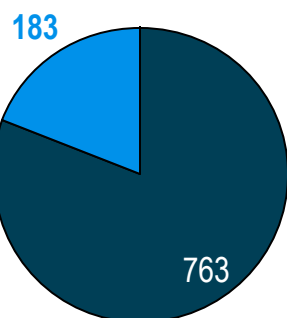
	Country	Project name	EUR m	privately financed
Mitsui Rail	GER	Electric Locomotives	47	fully
VPS GmbH	GER	Diesel Locomotives	40	partially
Europorte	FRA	Diesel Locomotives	36	fully
BASF SE	GER	Diesel Locomotives	34	fully

1) Market volumes shown here are overall volumes for the 2011-2013 period. They correspond to the average annual market volume as shown on p. 14 of this document

# Private financing has certain relevance in the wagon subsector

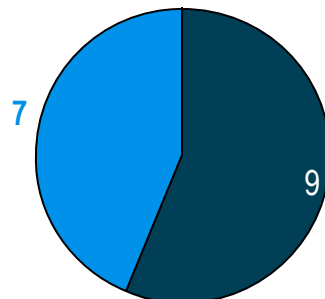
## Detailed results Coaches and Wagons<sup>1)</sup>

by Volume [EUR m]



Private finance Public finance

by # projects



- > Coaches and Wagons comprises product categories "Coaches-Single-deck" (EUR 116 m), "Coaches – Double-deck" (EUR 643 m) and "Wagons" (EUR 187 m)
- > With few exceptions private financing is concentrated on the purchase of **wagons for freight purposes**
- > Most privately financed projects in Coaches and Wagons can be characterized as **mid-size** purchases

Key projects (overall market)

	Country	Project name	EUR m	privately financed
Deutsche Bahn	GER	Coaches (Duplex)	254	-
DB Regio	GER	Coaches (Duplex)	110	-
VR Group	FIN	Coaches (Duplex)	90	-
Rhätische Bahn	CH	Coaches (Duplex)	88	-
VR Group	FIN	Coaches (Duplex)	55	-

Key projects (overall market, continued)

	Country	Project name	EUR m	privately financed
Ferrexpo	CH	Wagons	45	fully
BeNEX	GER	Coaches (Duplex)	45	partially
Ambrogio Trasporti	ITA	Wagons	44	fully
Touax Rail	FRA	Wagons	30	fully
Matterhorn Gotthard Bahn	CH	Coaches	17	partially

1) Market volumes shown here are overall volumes for the 2011-2013 period. They correspond to the average annual market volume as shown on p. 14 of this document

## C.2 Eastern Europe

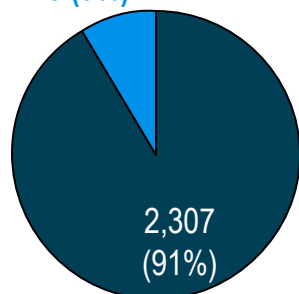


# Private financing accounts for about EUR 0.22 billion in Eastern European rolling stock volume

## Eastern Europe results of private financing shares

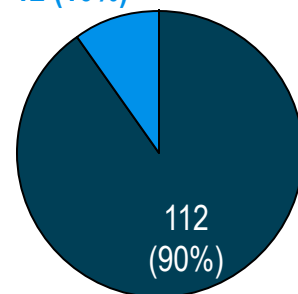
by Volume [EUR m]

218 (9%)



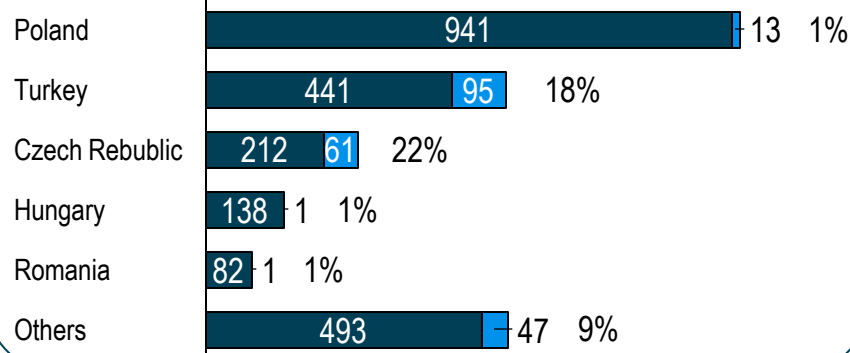
by # projects

12 (10%)

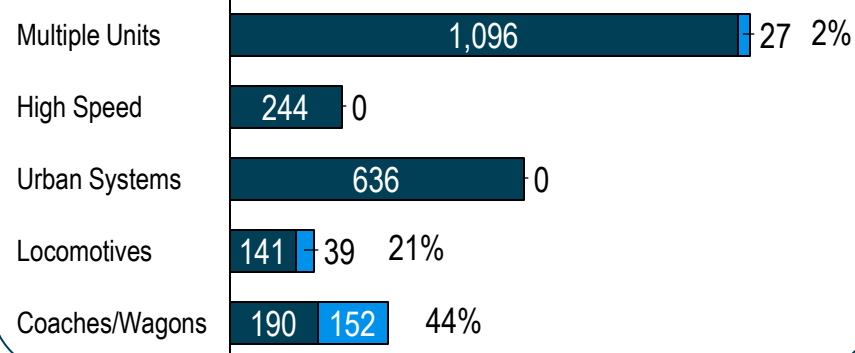


- > Whereas private financing accounts for about 9% (EUR 218 m) of total market volume, **10% of all projects are related to private financing** either to full extent or partly in Joint Ventures
- > **Turkey** and the **Czech Republic** are the major markets for private financing in rolling stock, representing 72% of the aggregated private financing volume in Eastern Europe
- > Private financing has considerable importance in the acquisition of **Coaches and Wagons** (44% share) as well as **Locomotives** (21%)

by country [EUR m]

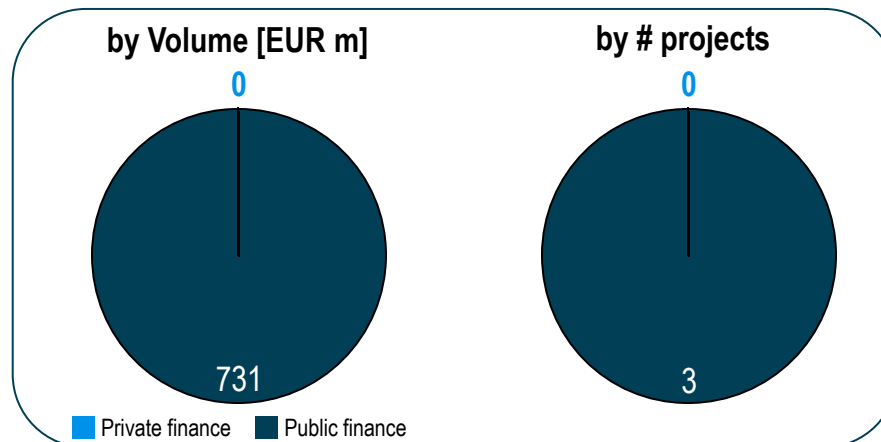


by product category [EUR m]



# Public customers finance both High Speed rolling stock projects in Eastern Europe

## Detailed results High Speed Trains<sup>1)</sup>



- > High Speed rolling stock comprises the product categories "VHS" (EUR 290 m) and "High Speed Trains" (EUR 441 m)
- > Customers of High Speed rolling stock are only **state-owned rail companies** in Poland and Turkey
- > There are not any projects in this segment with a private financing share

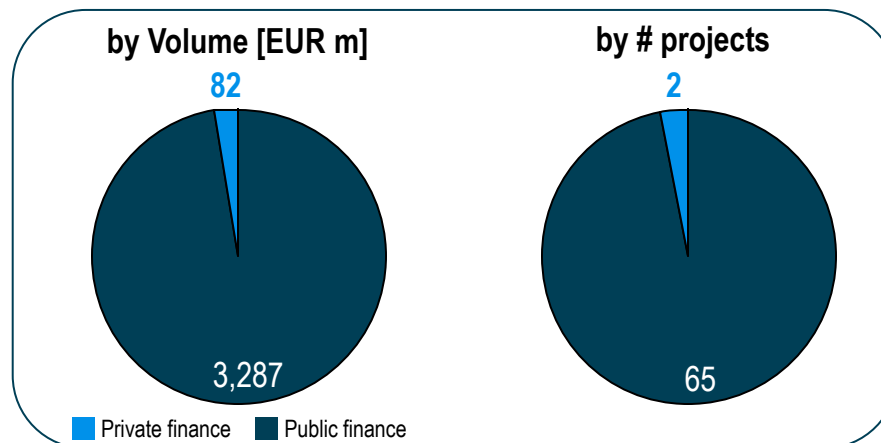
### Key projects (overall market)

	Country	Project name	EUR m	privately financed
PKP Intercity	POL	Pendolino Trains	347	-
TCDD	TUR	Velaro Trains	193	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

1) Market volumes shown here are overall volumes for the 2011-2013 period. They correspond to the average annual market volume as shown on p. 21 of this document

# The area of Multiple Units projects is also almost completely dominated by public financing

## Detailed results Multiple Units<sup>1)</sup>



- > Multiple Units comprises the product categories "DMUs" (EUR 525 m) and "EMUs" (EUR 2,844 m)
- > The segment is characterized by **many orders of small scale** with an average contract size of EUR 39.6 m
- > Private financing contributes **only 3% regarding quantity** as well as **only 2% regarding sales volume** of Multiple Units projects

### Key projects (overall market)

	Country	Project name	EUR m	privately financed
PKP Intercity	POL	20 Flirt-3 (EMU)	279	-
MAV Start	HUN	42 Flirt (EMU)	256	-
IZBAN	TUR	40 EMUs	155	-
Greater Poland Railways	POL	22 EMUs	112	-
Czech Railways	CZE	15 EMUs	98	-

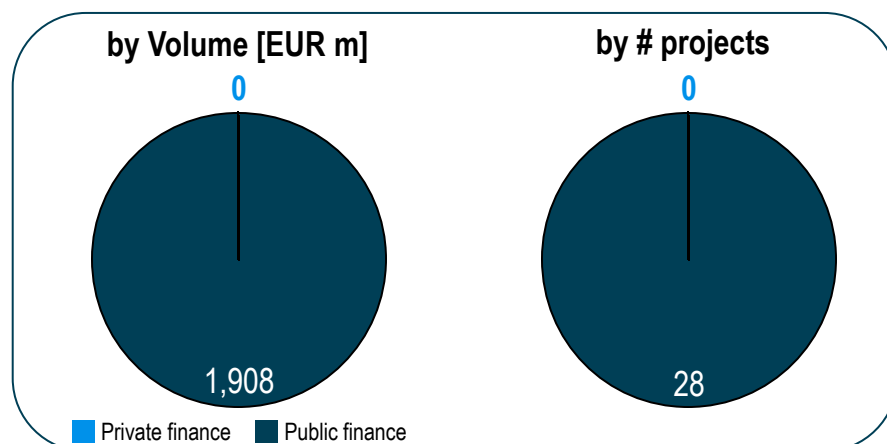
### Key projects (overall market, continued)

	Country	Project name	EUR m	privately financed
Czech Railways	CZE	15 EMUs	84	-
Regiojet	CZE	10 Link-2 (DMU)	33	fully
Zachodnia Regional Railway	POL	31 Impuls (EMU)	32	fully
-	-	-	-	-
-	-	-	-	-

1) Market volumes shown here are overall volumes for the 2011-2013 period. They correspond to the average annual market volume as shown on p. 21 of this document

# Urban Systems are completely operated by public enterprises

## Detailed results Urban Systems<sup>1)</sup>



- > Urban Systems comprises the product categories "Light rail vehicles" (EUR 906 m) and "Metro vehicles" (EUR 1.002 m). "Automated Systems" are currently nonexistent in the Eastern European market
- > Since almost every local transport network in Eastern Europe is exclusively operated by public bodies, the **share of private financing is zero**

### Key projects (overall market)

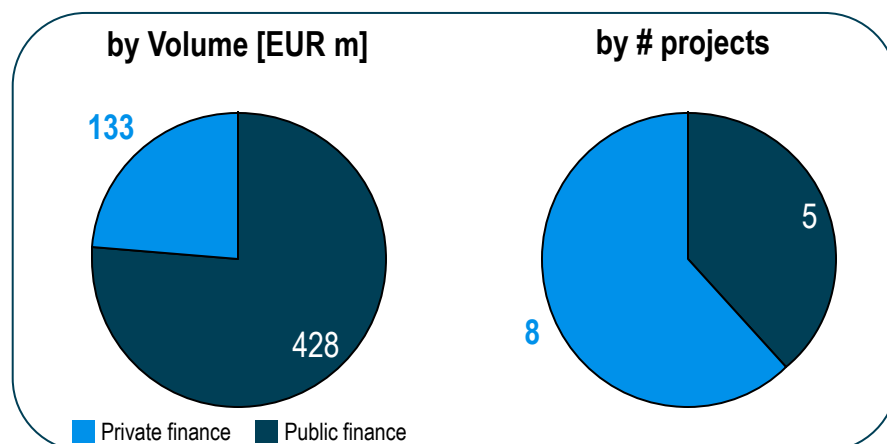
	Country	Project name	EUR m	privately financed
<b>Warsaw Metro</b>	POL	Inspiro Trains	272	-
<b>Ankara Metro</b>	TUR	324 Metro Cars	262	-
<b>Bucharest Metro</b>	ROM	96 Metro Cars	101	-
<b>Warsaw Metro</b>	POL	45 Light Rail Trains	88	-
<b>City of Samsun</b>	TUR	5 Light Rail Trains	59	-

1) Market volumes shown here are overall volumes for the 2011-2013 period. They correspond to the average annual market volume as shown on p. 21 of this document



# Private financing has certain relevance in the Eastern European locomotive sector with about a quarter of the volume

## Detailed results Locomotives<sup>1)</sup>



- > Locomotives comprises the product categories "Electric Locomotives" (EUR 418 m) and "Diesel Locomotives" (EUR 143 m)
- > With a share of 24% regarding sales volume, **private financing has significant relevance** in the Locomotive sector, being the **second largest single market**
- > Most privately financed projects in Locomotives can be characterized as **small to mid-size** purchases

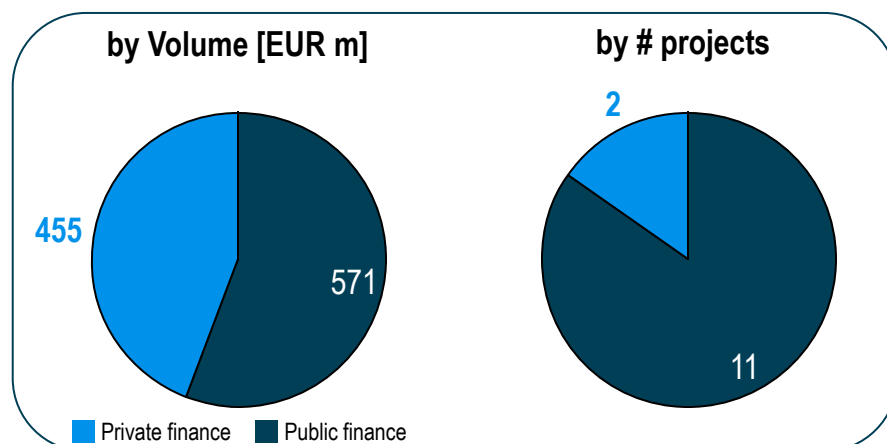
### Key projects (overall market)

	Country	Project name	EUR m	privately financed
TCDD	TUR	Electric Locomotives	191	-
TCDD	TUR	Diesel Locomotives	69	-
DB-Schenker	POL	Electric Locomotives	54	-
Metrans	CZE	E- and Diesel Locs	45	fully
Lotos Kolej	POL	Electric Locomotives	18	partially

1) Market volumes shown here are overall volumes for the 2011-2013 period. They correspond to the average annual market volume as shown on p. 21 of this document

# Private financing of Coaches and Wagons in Eastern Europe is limited to two large projects and reaches almost half of the volume

## Detailed results Coaches and Wagons<sup>1)</sup>



- > Coaches and Wagons comprises product categories "Coaches-Single-deck" (EUR 664 m) and "Wagons" for freight purposes (EUR 362 m)
- > The only purchase of **wagons for freight purposes is privately financed**, whereas coaches are almost entirely publicly financed
- > The two privately financed projects in Coaches and Wagons can be characterized as **large core** purchases

### Key projects (overall market)

	Country	Project name	EUR m	privately financed
<b>Tüpras</b>	TUR	Wagons	285	fully
<b>Czech Railways</b>	CZE	Railjet Coaches	151	-
<b>Regiojet</b>	CZE	Coaches	73	fully
<b>Romania Railway</b>	ROM	80 Coaches	51	-
<b>TCDD</b>	TUR	40 Coaches	46	-

1) Market volumes shown here are overall volumes for the 2011-2013 period. They correspond to the average annual market volume as shown on p. 21 of this document

Roland  
Berger

