

Private financing of rolling stock

Market analysis for Western and
Eastern Europe



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A. Objective, scope and procedure



The aim of the study was to assess the scale of private financing of rolling stock projects in Europe

Setup of the study

Objectives

- > Determine **absolute and relative importance of private financing of rolling stock projects**, focusing on
 - Different product categories (High Speed Trains, Multiple Units, Urban Systems, Locomotives and Coaches/Wagons)
 - Aggregated European market and major submarkets including Germany, the United Kingdom, France, Switzerland and Austria



Procedure

- > Analysis of **≈ 440 rolling stock projects** in the years 2013 to 2015 in **22 countries**
 - > Classification 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 financing due to state funding and explicit or implicit state guarantees
 - Where specific project-based financing information was available and revealed private financing portions, this private financing portion was taken into account even if the procuring entity was 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

All projects were assigned according to the product categories used in the UNIFE World Rail Market Study

Scope – Product categories



High Speed

- > Very High Speed Trains (>250 kph)
- > High Speed Trains (220–250 kph)



Multiple Units

- > DMUs (≤ 160 kph)
- > DMUs (161–219 kph)
- > EMUs (≤ 160 kph)
- > EMUs (161–219 kph)



Urban Systems

- > Light Rail Vehicles
- > Metro Vehicles
- > Automated Systems



Locomotives

- > Electric Locomotives
- > Diesel Locomotives
- > Shunters



Coaches/ Wagons

- > Single-deck Coaches
- > Double-deck Coaches
- > Wagons (Freight)






Our project database provides coverage of all significant European rail markets

Geographic scope and market volume by product category



- > Of the average annual market volume of **EUR 12.12 bn for Western and Eastern Europe**, an aggregate volume of **EUR 9.66 bn (80%)** has been classified as **publicly financed** according to the customer's financial structure
- > Of the **438 projects** analyzed from a contractor's perspective, 108 (25%) were in Germany, 55 (13%) in France, 53 (12%) in Poland, 30 (7%) in the United Kingdom, 29 (7%) in Italy, and 163 (37%) in other countries
- > Average **market volume per project** was approximately **EUR 83 m**

Average annual market volume by product category, 2013-15 [EUR bn, p.a.]

Europe Total	GER	GBR	FRA	SUI	AUT	Others	12.12
Multiple Units	6.42						
Urban Systems	2.32						
Coaches / Wagons	1.22						
Locomotives	1.08						
High Speed	1.07						

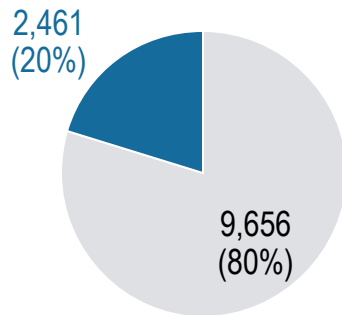
B. Key findings



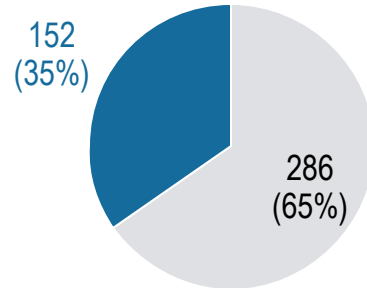
Private financing covers 20% of European rolling stock order volume

Overall results for private financing shares

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



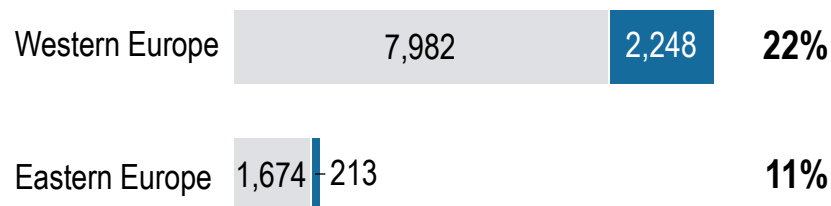
General insights

- > Private financing accounts for about 20% (EUR 2.46 bn) of total market volume, whereas **35% of all projects are supported by private financing** either fully or partially in Joint Ventures
- > By volume also private financing has considerable importance in relation to the purchase of **Locomotives** (42%), **Coaches and Wagons** (35%), as well as **EMUs and DMUs** (24%)

Regional insights

- > In **Western Europe** private financing can be found amongst all product categories; in **Eastern Europe** private financing is **not relevant** for **High Speed** and **Urban Systems**
- > Private financing is comparatively **important in the United Kingdom** (63%), the **Czech Republic** (37%), **Austria** (29%), and **Spain** (23%); higher private shares are only found in Greece and Portugal, yet based on a relatively small number of projects

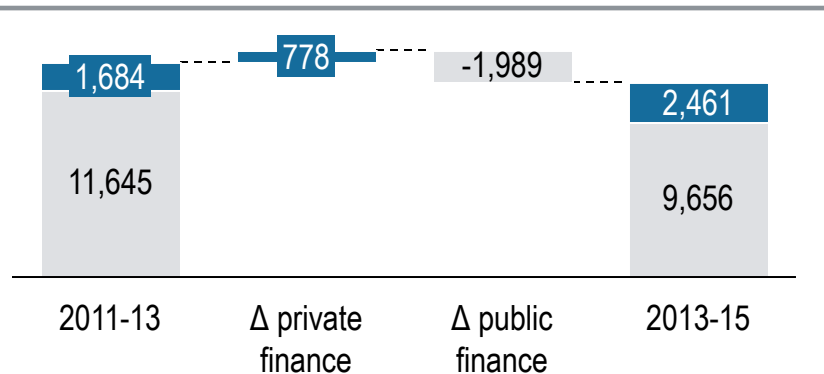
By volume and region [EUR m, p.a.]



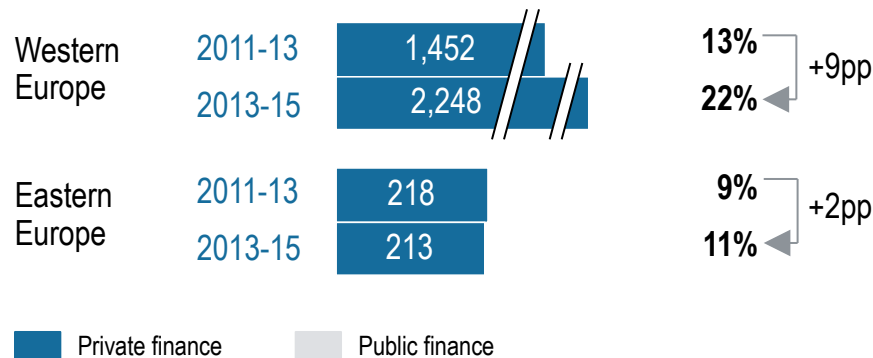
The volume share of private financing of rolling stock has increased compared to the previous study

Overall results compared to previous study (2011-13)

By volume [EUR m, p.a.]



By volume and region [EUR m, p.a.]



Trend insights

- > **Overall investment volume** p.a. in Europe has **dropped from EUR 13.33 bn** in the period 2011-13 **to EUR 12.12 bn** in 2013-15
- > The **volume share of private financing has increased** in the same period by EUR 778 m p.a., resulting in a relative increase **from 13% to 20%**
- > The **increase in volume share of private financing is more prevalent in Western Europe** (+9 pp) than in Eastern Europe (+2 pp)
- > **Further increase** in volume share of private investment, especially in **categories with a comparatively high element of private financing** (Locomotives, Coaches and Wagons and Multiple Units)
- > The **share of projects involving private financing has increased considerably** from 18% to 35%

Private financing is widely used for Multiple Units, Locomotives and Wagons

Key findings per product category



High Speed

- > The category of High Speed and Very High Speed Trains is **generally dominated by state-owned operators** such as state railways
- > For 2013-15, one partially privately financed project was documented



Multiple Units

- > With 62% of total private ROS financing, Multiple Units remain the **most important category of private investments in rolling stock**
- > 20 entirely or partially privately financed projects were implemented



Urban Systems

- > As most local transport networks are operated by public authorities or enterprises, **private financing plays a minor role** in Urban Systems (<1%)
- > In the research period, 4 projects with private financing have been noted



Locomotives

- > 42% of locomotive investment volume is covered by private financing, indicating the **importance of private financing** in this segment
- > 85 (out of 127) projects with shares of private financing were implemented

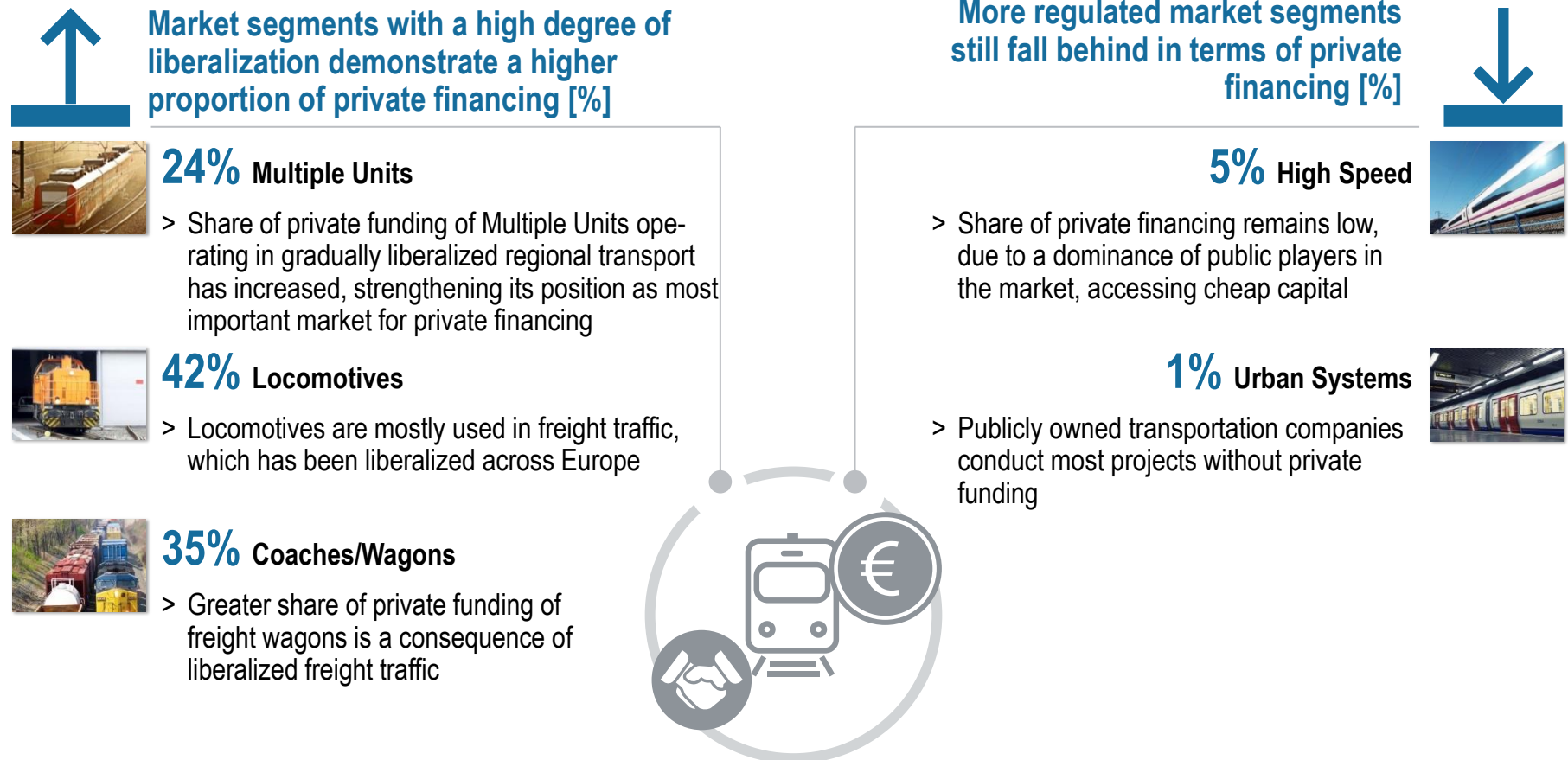


Coaches/ Wagons

- > Similar to the previous study, private financing is **well established in the Wagon, but to a lesser extent in the Coaches, sector**
- > A total of 42 partially or fully privately financed projects have been identified

Similar to the previous study, there is a correlation between the liberalization of market segments and private financing

Market liberalization and private financing



Based on further liberalization and more attractive conditions for private credit, we expect further growth of private financing

Expected development

1

Rail markets will be further liberalized

4th railway package

- > **Market liberalization of domestic rail passenger services** is an essential part of the market pillar of the package and could lead to significant growth of private funding in passenger transport
 - Mandatory public tendering and limits to direct awards
 - Opening of network infrastructure and service facilities

2

Private funding can balance scarcity of public funds

Limited public budgets

- > **Budgeting problems of the public sector** in most European countries lead to **increased private funding** of rail projects
 - Increasing future interest rates could exacerbate the existing budgeting problems
 - Private funding can enlarge the pool of funding available for rail transport

3

Private financing is becoming more attractive

Luxembourg rail protocol

- > The protocol lays the **foundation for a growing share of privately financed projects** and reduces dependence on public budgets
 - Global registration of security interests, establishing priority of creditor rights
 - International legal framework to regulate security interests
 - Worldwide common unique identification system enabling monitoring of status and location of assets



Significant growth of private financing

C. Results by region and segment



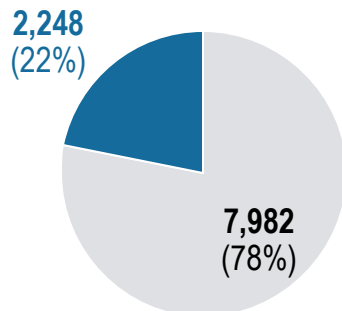
C.1 Western Europe



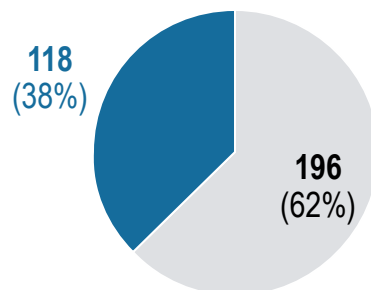
Private financing accounts for EUR 2.25 billion in the Western European rolling stock market

Western Europe results for private financing shares

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



General insights

- > While private financing accounts for about 22% (EUR 2.25 bn) of total market volume, **38% of all projects are related to private financing** either fully or partially
- > Private financing has considerable importance for the acquisition of **Locomotives** (39%), **Coaches and Wagons** (33%) as well as **EMUs and DMUs** (27%)

By volume and country [EUR m, p.a.]

Germany	2,488	323	11%
United Kingdom	835	1,425	63%
France	1,133	73	6%
Switzerland	708	9	1%
Others	2,817	419	13%

Private finance Public finance

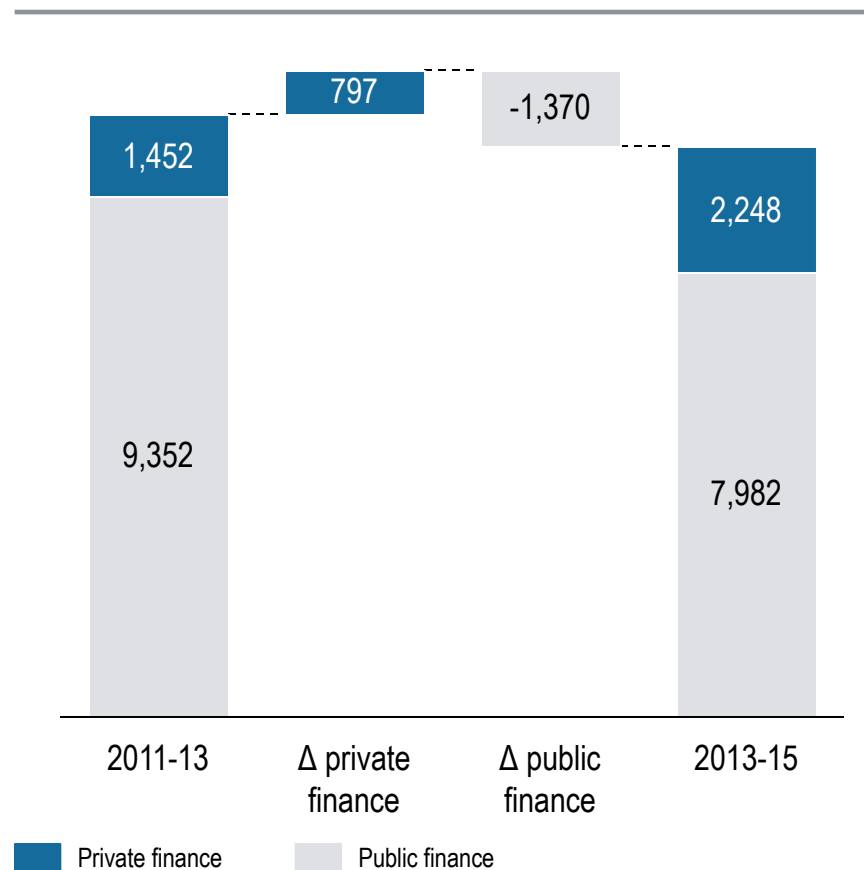
Country-specific insights

- > **Germany** and the **United Kingdom** represent **78%** of the aggregated private financing volume in Western Europe
- > While 63% of investment volume is represented by private investment in the **United Kingdom**, **53% of analyzed projects are subject to private financing**
- > While in **France** **36% of analyzed projects are covered by private financing**, private funding accounts for no more than 6% of volume share

In Western Europe, the volume share of private financing of rolling stock has increased by 9 pp in comparison with the previous study

Western Europe results in comparison with the previous study (2011-13)

By volume [EUR m, p.a.]



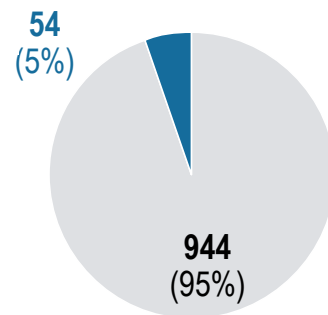
Trend insights

- > **Overall investment volume p.a. has fallen slightly** from EUR 10.80 bn in 2011-13 to EUR 10.23 bn in the 2013-15 period
- > This is a consequence of an absolute **decline in public investment**, as **private spending has increased** at the same time
- > While annual private investments in the 2011-13 period (EUR 1.45 bn) accounted for 13% of the total volume in Western Europe, the **increase by EUR 797 m p.a. in private spending results in a 22% (EUR 2.25 bn) private volume share** in the 2013-15 period
- > A considerable **relative increase of the private volume share** has been recorded in many Western European countries, such as the **United Kingdom** or **France**
- > In comparison with 22% of **projects that were covered by private financing** either fully or partially in 2011-13, in the 2013-15 period, **38%** of analyzed projects were assigned to this category

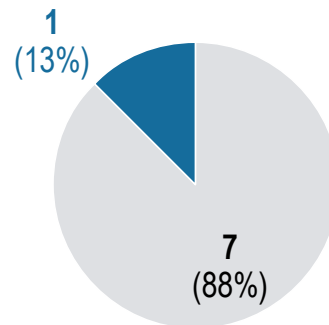
The category of High Speed rolling stock projects is largely dominated by public sector customers

Detailed results High Speed Trains

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



Project insights

- > High Speed rolling stock comprises the product categories "VHS" (EUR 240 m) and "High Speed Trains" (EUR 758 m)
- > **Major customers** of High Speed rolling stock are **typically state-owned rail companies** such as SBB or DB
- > The **only large project that is financed partially privately** is the purchase of Pendolino trains by the majority privately-held Italian company **Nuovo Trasporto Viaggiatori (NTV)**

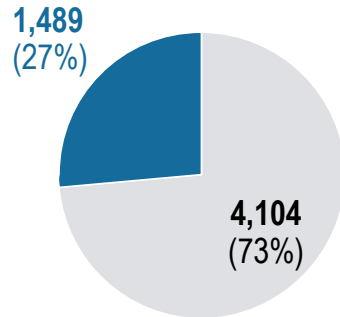
Key projects

	Country	Project description	EUR m	Privately financed
SBB	SUI	Eurocity Trains	804	-
DB	GER	ICEx	647	-
Eurostar	GBR	Velaro Trains	420	-
DB	GER	ICEx Trains	376	-
SNCF	FRA	Euroduplex Trains	300	-
NTV	ITA	Pendolino Trains	200	partially
Flytoget	NOR	Oaris Trains	120	-
SBB	SUI	Pendolino Trains	115	-

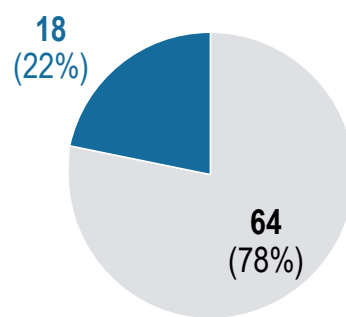
Multiple Units are the most important category in terms of absolute private financing activities in Western Europe

Detailed results Multiple Units

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



Project insights

- > Multiple Units comprises the product categories "EMUs" (EUR 5,054 m) and "DMUs" (EUR 539 m)
- > With a total share of EUR 1,489 m p.a, Multiple Units are the **most important** single product category attracting private financing
- > Large private projects are predominantly occurring in the **United Kingdom**, where projects are oftentimes financed by **consortia of several private companies**

 Private finance
  Public finance

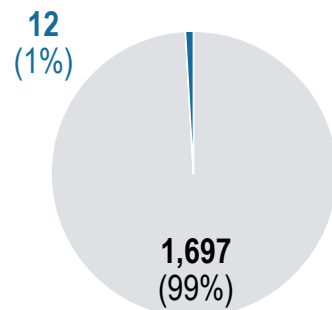
Key projects

	Country	Project description	EUR m	Privately financed
XLT	GBR	Desiro City	1,800	fully
TfL	GBR	EMUs	1,022	-
RRX	GER	EMUs	810	-
ERA	GBR	EMUs	657	fully
ÖBB	AUT	Desiro ML EMUs	584	-
ERA	GBR	Bi-Mode	543	fully
NS	NED	Civity	510	-
SNBC	BEL	Motor vehicles	471	-
S-Bahn Berlin	GER	EMUs	450	-
S-Bahn Berlin	GER	EMUs	445	-

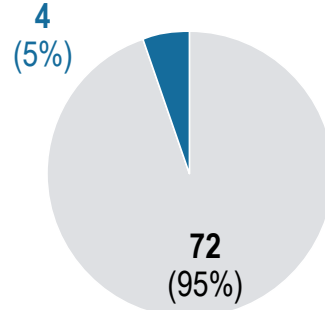
Investment in Urban Systems depends on publicly financed companies or city governments

Detailed results Urban Systems

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



Project insights

- > Urban Systems comprise the product categories "Light rail vehicles" (EUR 863 m), "Metro vehicles" (EUR 730 m), and "Automated Systems" (EUR 116 m)
- > Since most local transport networks in Western Europe are exclusively operated by public bodies, the **share of private financing is very low**
- > All listed key projects were entirely publicly financed

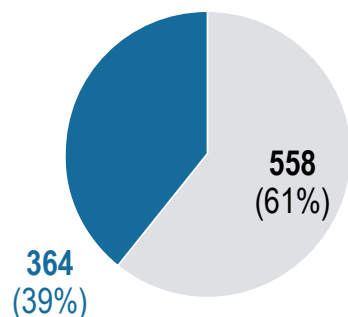
Key projects

	Country	Project description	EUR m	Privately financed
Storstockholms Lokaltrafik	SWE	Metro Stockholm	590	-
STIF	FRA	Metro Line 14	518	-
Wiener Linien	AUT	AT-Wien-Straßenbahn	286	-
Comune di Milano	ITA	Milano Linea M4	250	-
Rennes Metropole	FRA	Cityval Line b	228	-
BVG	GER	Flexity Berlin	176	-
VAG	GER	Metro Nuremberg	164	-
Euskotren	ESP	Bilbao Metro Line 3	150	-
HKL Metro	FIN	Metro Trains	140	-
Rheinbahn	GER	Düsseldorf / Köln HF-Stadtbahn	127	-

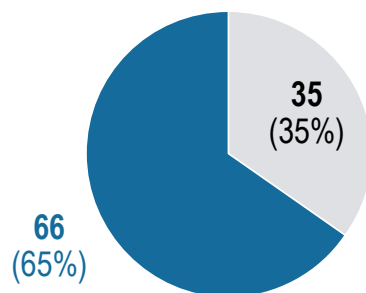
39% of the investment volume for Locomotives can be ascribed to private companies

Detailed results Locomotives

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



Project insights

- > Locomotives comprise the product categories "Electric Locomotives" (EUR 665 m), "Diesel Locomotives" (EUR 123 m) and "Shunters" (EUR 134 m)
- > With a share of 39% of sales volumes, **private financing is significant** in the Locomotive sector
- > **Private customers in large Locomotive projects are leasing companies** such as ELL Austria or Mitsui Rail Capital Europe

 Private finance
  Public finance

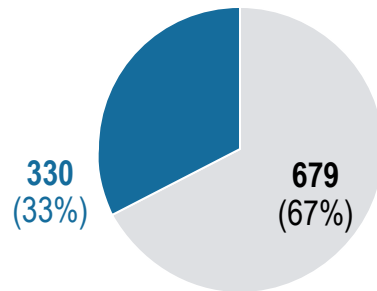
Key projects

	Country	Project description	EUR m	Privately financed
DB Schenker Rail	GER	187 101-210	330	-
VR Group	FIN	Electric Locomotives	320	-
SBB	SUI	Aem940	175	-
ELL Austria	AUT	MS & AC Locomotives	150	fully
ELL Austria	AUT	MS & AC Locomotives	100	fully
NS	NED	E186	86	-
NS	NED	E186	81	-
Mitsui Rail Capital Europe	NED	MS & AC Locomotives	79	fully
Trenitalia	ITA	E464	77	-
Mitsui Rail Capital Europe	NED	AC Locomotives	70	fully

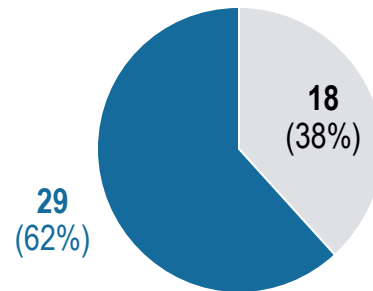
The Coaches and Wagon subsector is another category with a high share of private investment

Detailed results Coaches and Wagons

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



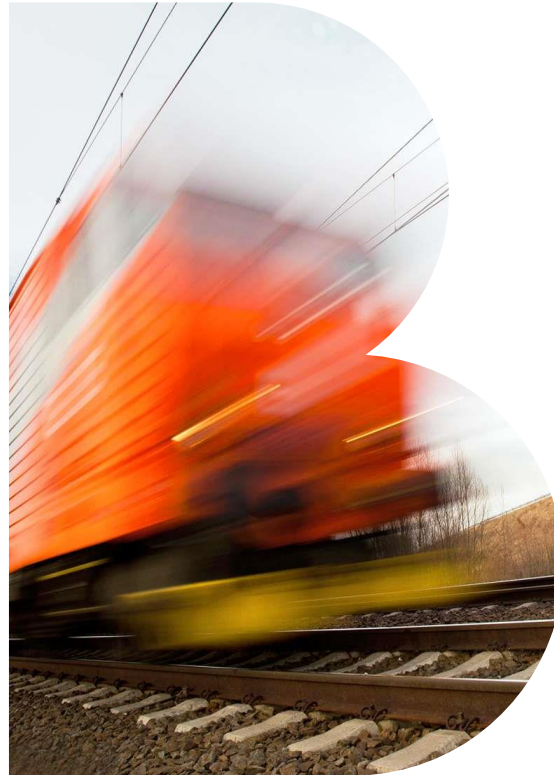
Project insights

- > Coaches and Wagons comprises the product categories "Single-deck Coaches" (EUR 164 m), "Double-deck Coaches" (EUR 446 m), and "Wagons" (EUR 399 m)
- > The **(partially) private project with the highest order volume is the Caledonian Sleeper** with the Serco Group, which accounts for EUR 200 m

Key projects

	Country	Project description	EUR m	Privately financed
SNCB	BEL	Driving Cars/ Coaches	787	-
Serco Group	GBR	Caledonian Sleeper	200	partially
Trenitalia	ITA	Vivalto Option/ Coaches	190	-
ÖBB	AUT	Viaggio Comfort ÖBB Railjet	147	-
Transport Scotland	GBR	Coaches	126	-
Eurotunnel	GBR	Lorry-carrying wagons	120	fully
DB Regio	GER	Ringzug West	110	-
Trenitalia	ITA	Vivalto Option/ Coaches	98	-
VR Group	FIN	Double-deck Coaches	90	-
VR Group	FIN	Double-deck Coaches	55	-

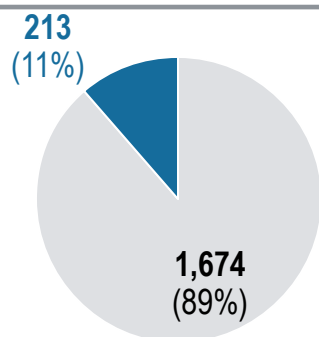
C.2 Eastern Europe



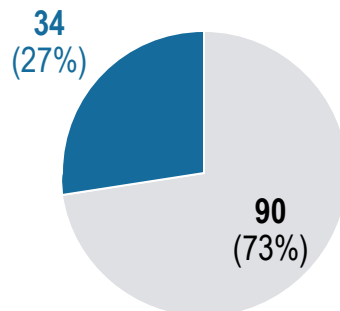
Private financing accounts for about EUR 213 million of rolling stock procurement in Eastern Europe

Eastern Europe results for private financing shares

By volume [EUR m, p.a.]



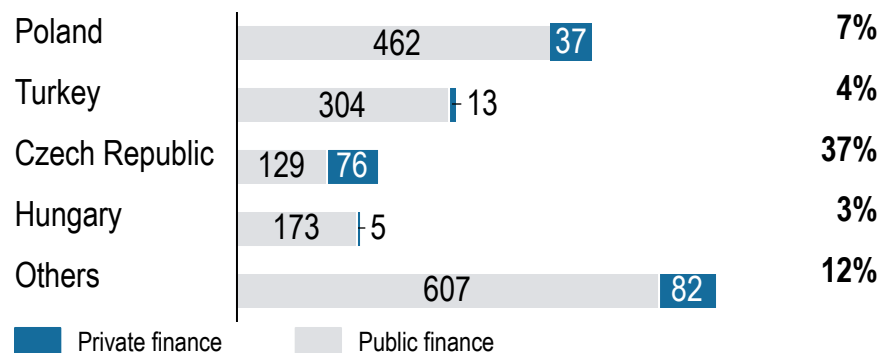
By projects [# , total 2013-15]



General insights

- > Private financing accounts for about 11% (EUR 213 m) of the total market volume, whereas **27% of all projects are related to private financing** either fully or partially
- > Private financing is important for the acquisition of **Locomotives** (54%) as well as for **Coaches and Wagons** (47%)

By volume and country [EUR m, p.a.]



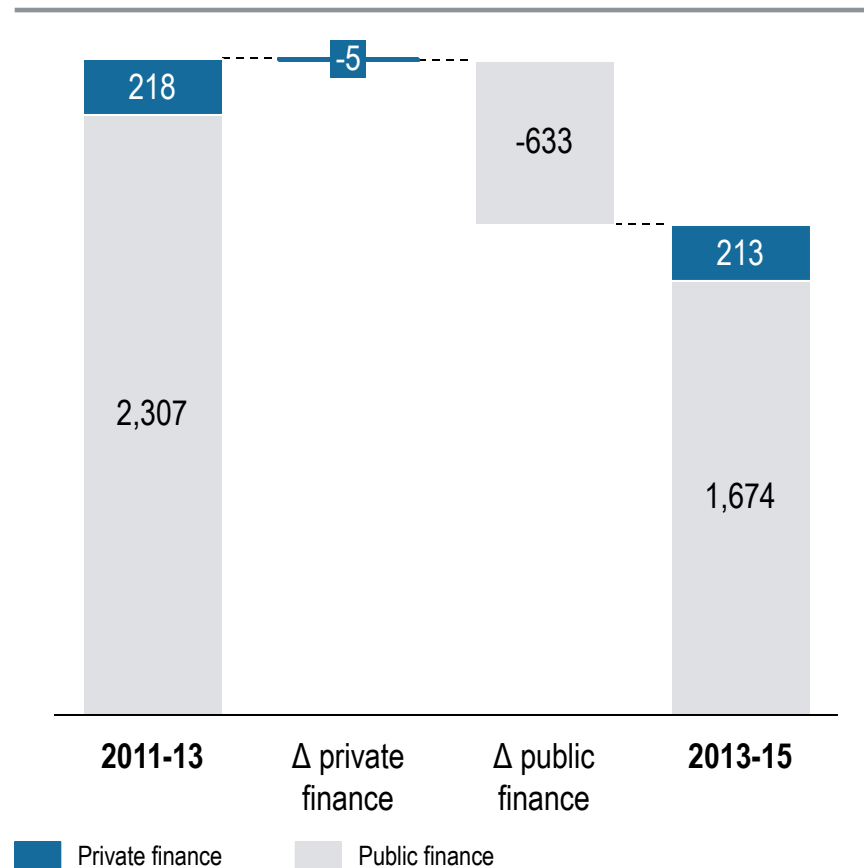
Country-specific insights

- > The **Czech Republic and Poland represent 53% of aggregated private financing volume** in Eastern Europe
- > In **Poland**, **23% of all analyzed projects are privately financed**, accounting for 7% of volume spending in the country
- > 37% of volume share in the Czech Republic corresponds to 11 private projects that account for **65% of all analyzed Czech projects**

In Eastern Europe, the absolute volume of private financing of rolling stock has remained stable in comparison with the previous study

Eastern Europe results in comparison with the previous study (2011-13)

By volume [EUR m, p.a.]



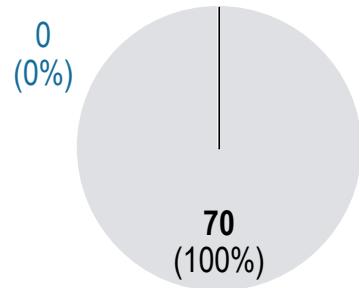
Trend insights

- > **Overall investment volume p.a. has fallen slightly** from EUR 2.53 bn in 2011-13 to EUR 1.89 bn in the 2013-15 period
- > Comparable to Western Europe, the **decline can be attributed to lower public spending** – private spending remained stable in the same period
- > The **relative increase of 2 percentage points in private finance** (from 9% to 11%) coincides with a marginal absolute decrease in volume (EUR 218 m to EUR 213 m)
- > A considerable relative **increase in private spending** took place in the **Czech Republic and Poland**
- > In comparison to the **previous period, in which 10% of projects were covered by private financing**, **27%** of all analyzed projects in the current study are financed either partially or entirely privately

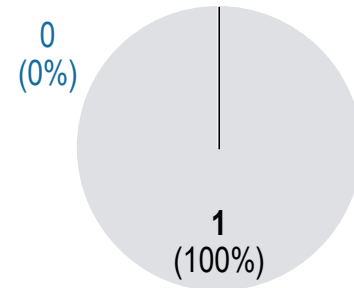
The single analyzed High Speed rolling stock project in Eastern Europe is publicly financed

Detailed results High Speed Trains

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



Key projects

	Country	Project description	EUR m	Privately financed
TCDD	TUR	Velaro Trains	210	-

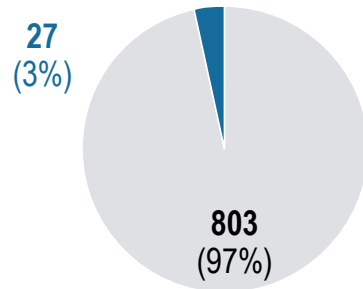
Project insights

- > High Speed rolling stock comprises the product category "VHS" (EUR 70 m) as no High Speed projects were initiated
- > The **only customer of Very High Speed rolling stock in Eastern Europe** that has been documented in recent years is the public enterprise **Turkish State Railways (TCDD)**

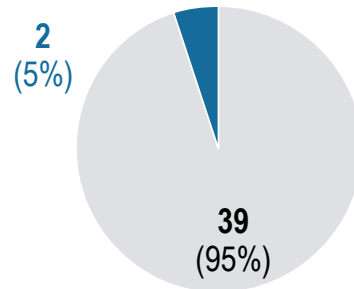
Private investments only play a minor role in the financing of Multiple Unit projects in Eastern Europe

Detailed results Multiple Units

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



Project insights

- > Multiple Units comprises the product categories "DMUs" (EUR 152 m) and "EMUs" (EUR 678 m)
- > **All major projects in this subcategory are financed publicly**, for example by state-owned joint ventures or state-owned railway companies such as those of Poland and Serbia

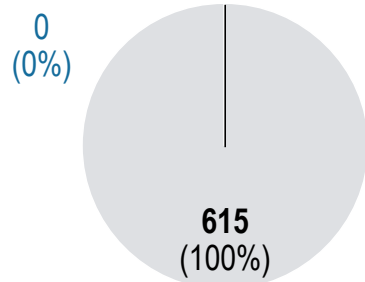
Key projects

	Country	Project description	EUR m	Privately financed
MAV / GySEV	HUN	EMUs (Flirt)	269	-
PKP Intercity	POL	EMUs	197	-
PKP Intercity	POL	EMUs (Flirt 3)	170	-
MAV	HUN	EMUs (Flirt)	125	-
PKP Intercity	POL	EMUs (Flirt 3)	114	-
Serbian Railways	SRB	EMUs (Flirt 3)	100	-
Ceske Drah	CZE	EMUs	94	-
ZSR	SVK	EMUs	87	-
Serbian Railways	SRB	DMUs	78	-
ZSSK	SVK	DMUs	78	-

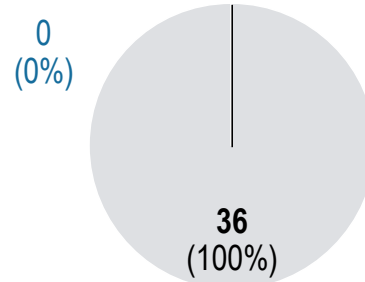
In Eastern Europe, Urban Systems are completely financed by public entities

Detailed results Urban Systems

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



Project insights

- > Urban Systems comprises the product categories "Light rail vehicles" (EUR 530 m) and "Metro vehicles" (EUR 84 m)
- > Since almost every local transport network in Eastern Europe is operated by public bodies, the **share of private financing is zero in this study**
- > Accordingly, **customers in large projects are city governments** or their related transportation operators

Private finance Public finance

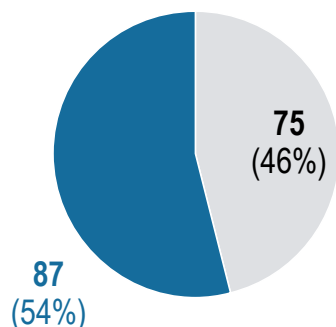
Key projects

	Country	Project description	EUR m	Privately financed
DPP	CZE	Prag 15T ForCity Skoda	130	-
Istanbul Municipality	TUR	New Line M5	119	-
Konya	TUR	Konya Tram	105	-
BKK	HUN	Trams	90	-
MPK Krakow	POL	Trams	86	-
Burulas	TUR	Bursa New LRT Vehicles	82	-
Istanbul Municipality	TUR	Metro Istanbul	78	-
MPK Krakow	POL	Trams	70	-
Izmir Municipality	TUR	Izmir 85 LRV Vehicles	67	-
Metro Izmir	TUR	Izmir Konak & Karsiyaka Line	60	-

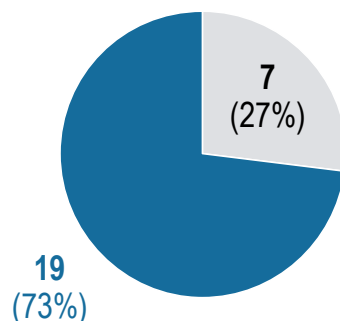
More than half the investment volume in the Eastern European Locomotive sector comes from private financing

Detailed results Locomotives

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



Project insights

- > Locomotives comprise the product categories "Electric Locomotives" (EUR 122 m), "Diesel Locomotives" (EUR 14 m) and "Shunters" (EUR 25 m)
- > With a 54% share in volume and EUR 87 m p.a., the Locomotive subcategory is the **second largest single market for private financing** in Eastern Europe

 Private finance
  Public finance

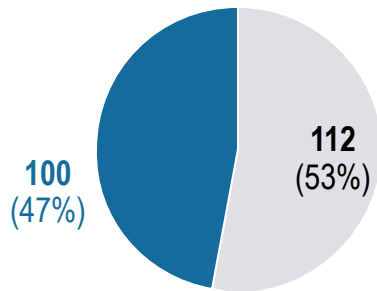
Key projects

	Country	Project description	EUR m	Privately financed
Metrans	CZE	EMUS	74	partially
PKP Cargo	POL	MS Locomotives	60	partially
Metrans	CZE	EMUS	37	partially
ArcelorMittal Ostrava	CZE	Shunters	36	partially
PKP Intercity	POL	DMUs	25	-
Freightliner Poland	POL	Dragon Last Mile	18	fully
DB Schenker Rail	ROU	Transmontana AC	13	-
Advanced World Transport	CZE	EMUs	12	fully
DB Schenker Rail	HUN	Transmontana AC	10	-
PHU Lokomotiv	POL	Gama DC	9	fully

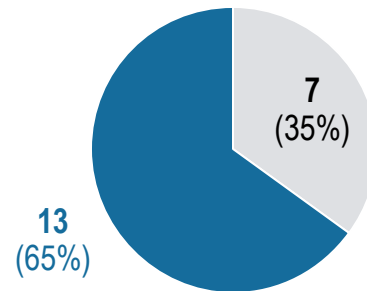
Coaches and Wagons are the most important subcategory for private financing in Eastern Europe

Detailed results Coaches and Wagons

By volume [EUR m, p.a.]



By projects [#, total 2013-15]



Project insights

- > Coaches and Wagons comprise the product categories "Single-deck Coaches" (EUR 89 m), "Double-deck Coaches" (EUR 18 m) and "Wagons" (EUR 104 m)
- > The **largest project** is the purchase of **73 coaches by the private Czech company RegioJet**, costing EUR 73 m

Key projects

	Country	Project description	EUR m	Privately financed
RegioJet	CZE	Coaches	73	fully
CFR	ROU	Coaches	51	-
Koleje Mazowieckie	POL	Coaches	43	-
PKP	POL	Warszawa / Pozna	35	
PKP Cargo	POL	Wagons	32	partially
ZSSK	SVK	Coaches	31	-
Polzug	POL	Wagons	26	partially
Tüpras	TUR	Wagons	23	fully
ZSSK	SVK	Passenger Cars	18	-
Laude	POL	Wagons	7	fully

Roland
Berger

