SCI/Verkehr

HIGHSPEED RAIL TRANSPORT – GLOBAL MARKET TRENDS

Forecast, Installed Base, Manufacturers, Infrastructure and Rolling Stock Projects

2023

CONTENT

Executive Summary

CAGR worldwide
[redacted] OEM
[redacted] After-sales

CAGR worldwide
without China
[redacted] OEM
[redacted] After-sales

(in million Euro)

Coming from a peak in 2017, OEM market volume for HSR vehicles will globally further reduce due to decreases in China – after-sales grows steadily until 2030, with growing and aging fleet sizes.

The global market for HSR vehicles has seen an all-time peak around 2017 with an annual market volume of more than EUR 13 billion, majorly caused by procurements from China. Since then, market volumes have reduced to around EUR 9 billion and will further reduce to a range between EUR 6 to 10 million until 2030 with an upward trend towards the late 2020s. This development is driven by the Chinese market, accounting for more than half of the worldwide market.

CAGR **worldwide**

OEM -[redacted]%

After-sales +[redacted]%

CAGR worldwide **without China**

OEM +[redacted]%

After-sales +[redacted]%

The after-sales market in contrast grows steadily to more than EUR 20 billion by the end of the decade with a CAGR of 7% until 2027. It increases strongly and steadily as it benefits from the increasing and aging fleets as well as refurbishments of old vehicles.

Worldwide Market Volume for HSR vehicles (in EUR million)

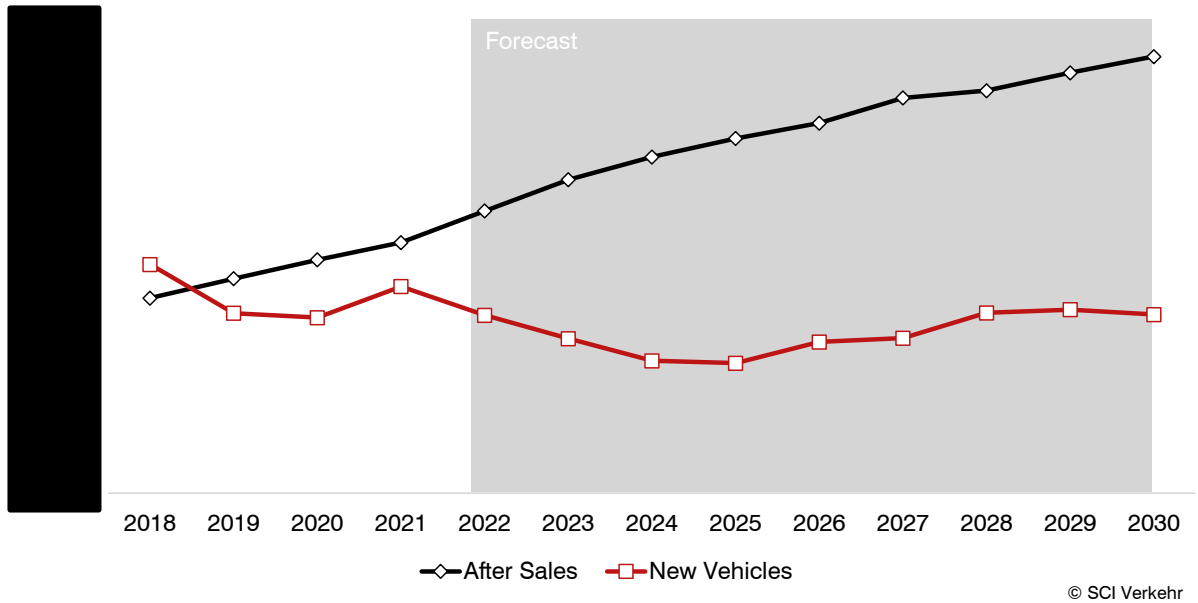
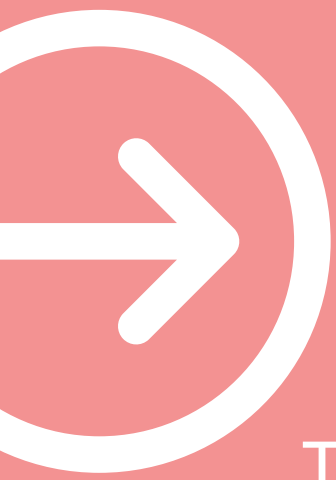


Figure 1: World: Market volume forecast



Trends and drivers impacting the global HSR vehicle market

1 The market for HSR vehicles is concentrated in Asia and Europe

The market for HSR vehicles is concentrated in Asia and Europe

The market for HSR vehicles – a mostly Asian and European market – reduces further in Asia from Chinese delivery peaks, despite growth outside China, while European markets grow by more than [redacted]% annually. Expansion of HSR infrastructure, economic and population growth, urbanisation, focus on environmentally friendly passenger transport as well as competition regionally are driving the global market for HSR vehicles.

The market for HSR vehicles is mostly concentrated in Europe and Asia. For the latter, the Chinese market is not only shaping the regional market but also the global market. The massive expansions of Chinese HSR infrastructure and procurements of respective vehicles marked a never seen market dynamic. Both large regions reveal different market developments in recent history and the near future. Whereas the Chinese market has reduced from its previous peaks, also pulling down the global market by its sheer size, the European market has currently reached a peak of around EUR [redacted] billion.

Following the massive procurements of HSR vehicles in China with annual market volumes in China exceeding EUR 8 billion annually (nearly EUR [redacted] billion globally), the OEM market size has decreased and was caught up by the after-sales market in 2019. The world's after-sales market benefits from an increasing fleet size most of all in Asia. Also, large shares of old vehicles demanding services in Europe drive the market. Whereas the OEM market will fluctuate between EUR [redacted] billion annually until 2030, the after-sales market will continuously grow to more than EUR [redacted] billion by 2030.

HSR vehicle market: Market volume in Europe and Asia (OEM; in EUR million)

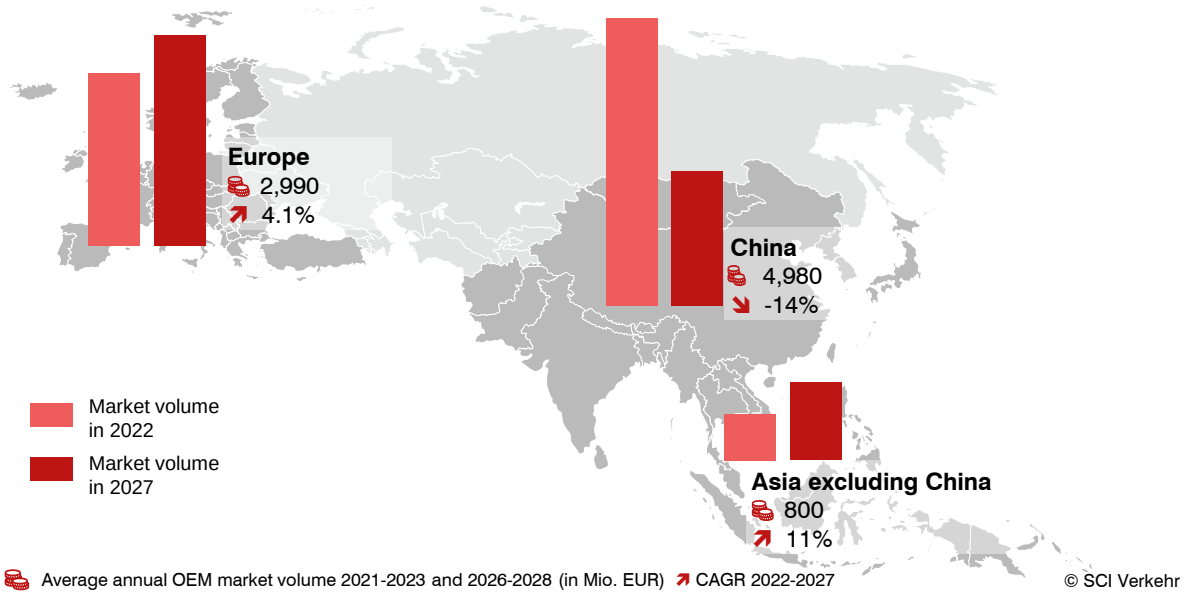


Figure 2: World: OEM market development in Asia and Europe region

The world's HSR infrastructure is growing as well. Currently, there are around 71,000 km HSR lines worldwide, of which more than 60% are located in China. Until 2030, the total route length is expected to grow by 55%. Practically all countries are extending their networks and another five countries namely Indonesia, Thailand, India, Czech Republic or Egypt are expected to introduce its first HSL before 2030.

HSR transport is expected to grow in all world regions. Constant growth in metropolitan areas, an economic catch-up process of economies outside the established industrialised countries and the focus on environmentally friendly but efficient transport modes will be strengthened by increasing energy costs and rising environmental awareness. In the end, however, regional factors such as legal and economic conditions as well as the political situation and the resulting willingness of private investors to invest in corresponding projects have large influence on the final implementation.
Another important factor is public finance as most of the investments in HSR networks comes from public funds. Public finance depends highly on the economic development. European, and Asian countries like China, Japan and South Korea have the budgetary funds and political stability to provide certainty for investments. In Eastern Europe, the economic crisis and political insecurity of Turkey casts doubts on ambitious procurement and infrastructure projects. India and other Asian markets need to rely on Public-Private-Partnership (PPP) and international assistance from China and Japan to finance HSR systems. Many countries in South-/ Central America and Africa & Middle East lack the stable environment to attract big investments. In the CIS region, the war between Russia and Ukraine raises uncertainty for the development of both countries.

The regions outside the prime markets Asia and Europe show different trends and drivers in the market for HSR vehicles

ASIA

Asia outside core markets

- Besides the traditional high-speed markets in the region such as Japan, Korea, China and Taiwan, new markets will be developed within the next five years. Indonesia, introducing its first high speed line by 2023, will be followed by Thailand and India in the upcoming years. All named systems are supported by Chinese and Japanese for the case of India know-how.
- In general, a variety of other countries, such as Vietnam, Pakistan, Bangladesh or Malaysia provide valuable opportunities for high-speed lines. It is however evident, that these markets will require foreign assistance from China and Japan. Respective financial and technical support is present in the market.

CIS

CIS

- In Russia, the market volume is currently very low due to the suspended deliveries of high-speed trains by Siemens. SCI Verkehr

does not expect any further deliveries in the next 1-2 years until new trains are built in Russia in the mid-2020s, probably with new partners. Starting at a low level, SCI Verkehr expects a high growth in terms of CAGR due to new deliveries from mid-2020s.
– The current Russian invasion of Ukraine is likely to challenge the implementation of future high-speed line projects. Whereas Russia is likely to pursue its projects with support from China, the reconstruction in Ukraine, once the war is over, could possibly include the establishment of high-speed lines in the country, which will likely obtain wide financial support from the EU and its Western allies.

AFRICA
MIDDLE EAST

Africa & Middle East

– The market volume in the region for HSR vehicles will largely be driven by the procurement of Velaro trains from Siemens in Egypt, orders by Etihad rail in UAE and expected procurements from Morocco and Saudi-Arabia.
– Possibly, Iran will become relevant until 2030, given the expansion of relevant infrastructure, however, an employment of push-pull trains is also possible. Beyond 2030 plans exist for Israel, South Africa and Gulf countries; however, materialisation is still insecure.

NORTH
AMERICA

North America

– The OEM market volume is expected to range below EUR [redacted] million annually within the next five years. The California high speed network is currently expecting to introduce its first phase in 2030 with additional expansion phasis planned thereafter. In addition, Brightline West connecting Las Vegas and Los Angeles is likely to be implemented and requires HSR vehicles.
– Market volumes at the end of the decade are therefore expected to range at around EUR [redacted] million annually. There are other suggested lines in Texas, the North-western US, Mexico and Canada the planned projects are often facing insufficiencies in funding. Materialisation is mostly not expected before 2035.

SOUTH
CENTRAL
AMERICA

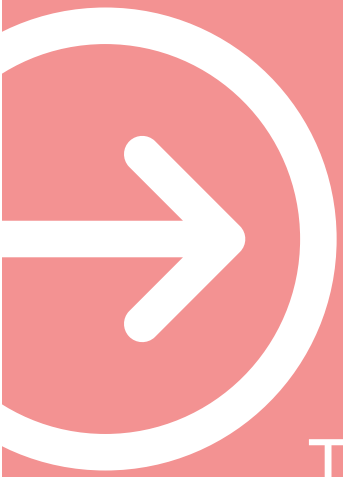
South & Central America

– SCI Verkehr does not expect a relevant market volume for HSR vehicles in the region until 2030. Despite enormous potential connecting large metropolises for instance in Brazil or Argentina previous plans have never materialised. A high-speed service from Rio de Janeiro to Sao Paulo has been on the agenda for decades. An implementation is not realistic before 2035.

AUSTRALIA
PACIFIC

Australia & Pacific

– SCI Verkehr does not expect a relevant market volume for HSR vehicles in Australia until 2030. Despite several plans in the past, an implementation has never materialised. As of now, an implementation of a line from Sydney to Canberra or Melbourne will not be introduced before 2035. The recent change of government in Australia with a stronger emphasis on climate policies has readjusted the priority of the potential project.



Trends and drivers impacting the global HSR vehicle market

4

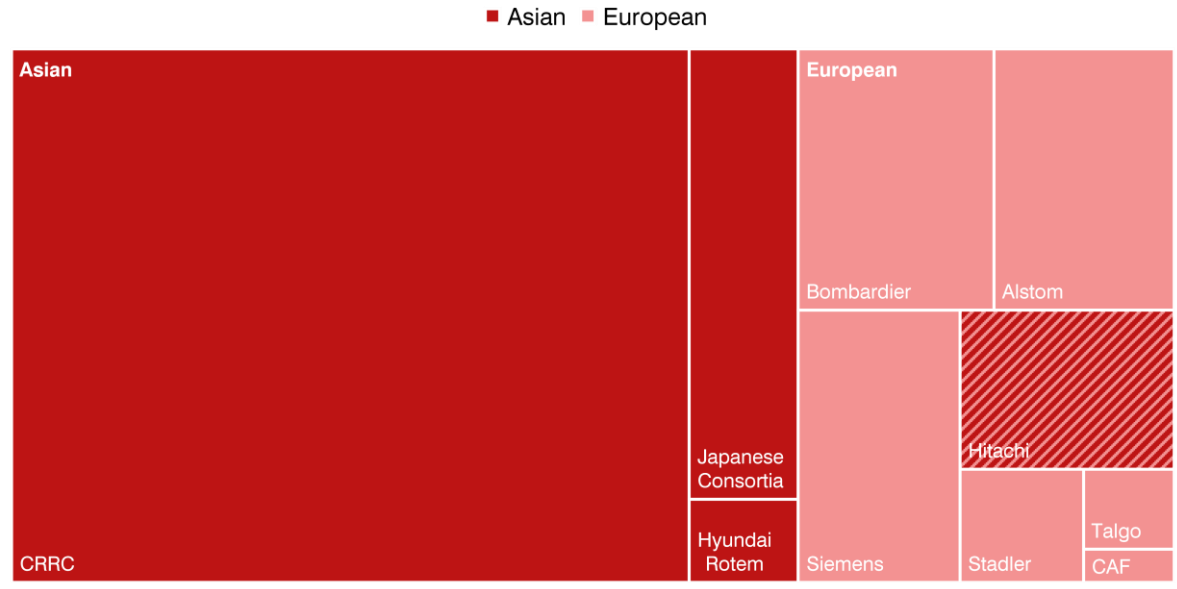
CRRC leads global HSR vehicle market despite large declines in its home market – Alstom becoming unchallenged second

CRRC leads global HSR vehicle market despite large declines in its home market – Alstom becoming unchallenged second

CRRC has led the global HSR vehicles market within the past five years, although market exploration of new market such as Indonesia and Thailand are not able to level the recent strong declines in its home market; regardless market dominance will remain. With the acquisition of Bombardier by Alstom and its strong presence with its Avelia platform, Alstom will become the unchallenged second in the global market.

The top five manufacturers in the HSR vehicle market of the past five years were CRRC, Japanese Consortia, Alstom, Siemens and Bombardier. Followed by Hitachi Rail in Europe and Stadler, these companies divide [redacted]% of the market amongst themselves, while CRRC alone takes about [redacted]% of the market.

Market shares per manufacturer worldwide (in cars, 2017-2021)



© SCI Verkehr

Figure 8: World: HSR vehicle market overview

More than for other rolling stock segments, HSR markets are commonly national prestigious markets being served by the local manufacturer. Only in Europe and in markets without an own industry for HSR vehicles, a contingent open market competition is present. Therefore, the biggest market for most manufacturers is their region of origin. Besides these, in the past five years, CRRC has increased its activities abroad and delivered to Indonesia. In the coming years, Thailand and the Austrian open access operator Westbahn will be receiving HSR vehicles from the Chinese state-owned manufacturer.

Alstom jointly with former Bombardier is the largest manufacturer in Europe. Bombardier's HSR models have been delivered to Italy,

Spain, Sweden, Belgium, Switzerland; Alstom has been delivering its HSR vehicles to France, Italy, Netherlands and the US. With a large backlog of orders for its Avelia platform and the order for VHST in the UK, Alstom will be able to secure the second position in the market.

Outside its home market in Germany, Siemens has been delivering vehicles to Turkey and Russia and Hitachi was successful in the UK.

HSR vehicle platforms by subsegment, manufacturer and market relevance

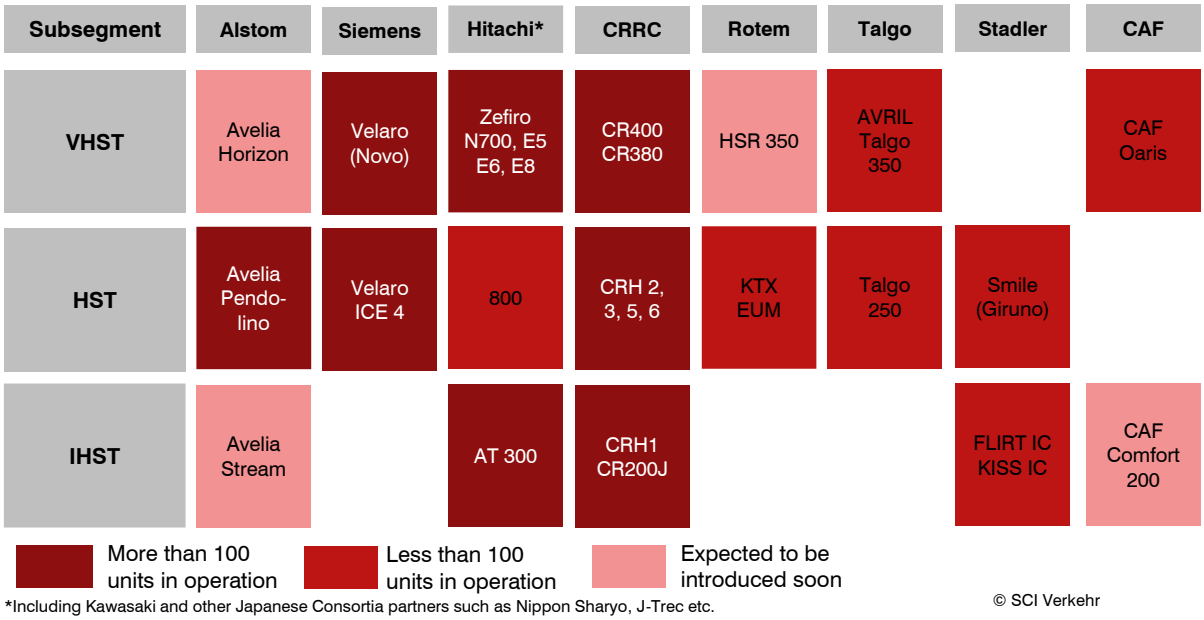
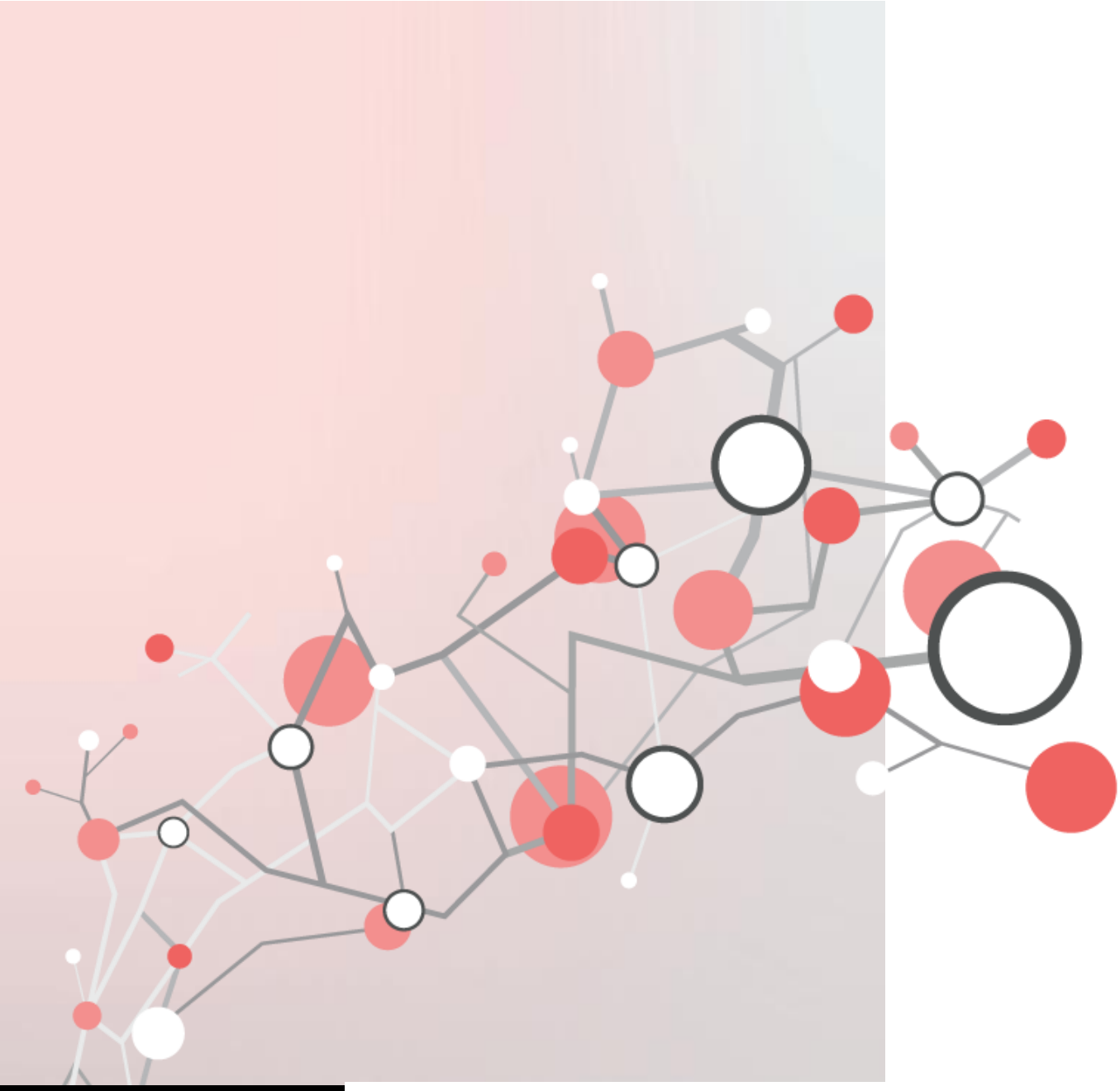


Figure 9: HSR vehicle platforms by subsegment manufacturer and market relevance

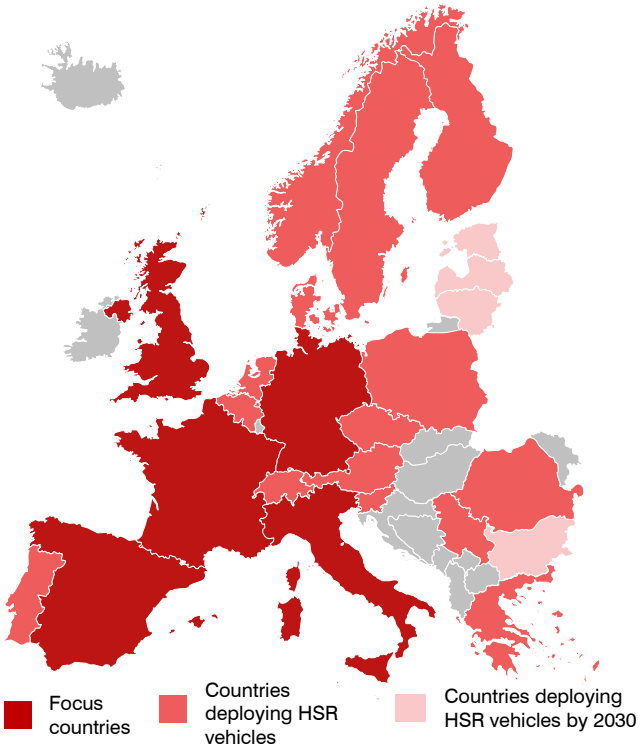
All large manufacturers for passenger rolling stock have HSR vehicles within their portfolio. Alstom for instance has clustered its HSR vehicle platform under the brand name Avelia, with a differentiation by speeds. Other manufacturers usually dispose a flagship product such as Siemens with different generations of ICE, that are also exported to other country markets in adapted versions.



2 The market for HSR vehicles in Europe

2 Europe

2.1 Total Market



Europe in 2022	
Mainline railway network (km)	[redacted]
Total transport performance (million pkm)	[redacted]
Rail modal share (%)	[redacted]
Share of PSO (%)	[redacted]
Share of Open Access (%)	[redacted]

Fleet →	Size (units)	Avg. age (years)	Trend (2022-2027)
IHST	[redacted]	[redacted]	↗
HST	[redacted]	[redacted]	→
VHST	[redacted]	[redacted]	↗
Total	[redacted]	[redacted]	↗

OEM ↗	Market volume (EUR million) 2022	2027	CAGR (2022-2027)
Total	[redacted]	[redacted]	[redacted]

After-sales ↗	Market volume (EUR million) 2022	2027	CAGR (2022-2027)
Total	[redacted]	[redacted]	[redacted]

2.1.1 Market Volume & Development

Market Volume in Europe for HSR vehicles (in EUR million)

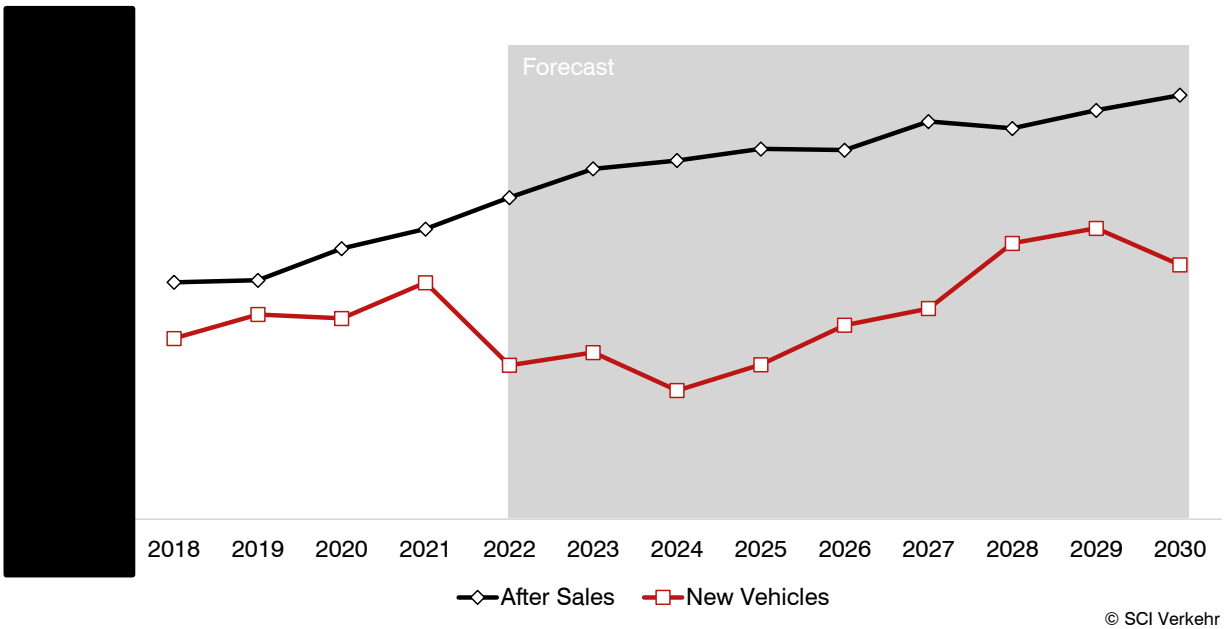


Figure 10: Europe: Market volume forecast

2.2 France

2.2.1 Market Volume & Development

France – Market volume & Development for HSR vehicles		
Indicator	**New Vehicles (OEM)**	**After-Sales**
Average annual volume 2021-2023 (in EUR)	[redacted]	[redacted]
Average annual volume 2022-2027 (in EUR)	[redacted]	[redacted]
Future trend	→	→

The OEM market in France reaches around EUR [redacted] million in 2022 at a lower level and will experiences peaks with annual volume of more than EUR [redacted] with deliveries of Avelia Horizon, CAF 200 Comfort and Talgo's Avril to LeTrain. Towards the end of the 2020s the market volume is expected to reduce to around EUR [redacted] million annually.

The market volume is predominantly driven by the following drivers:

Drivers	Facts	Trend
Installed base / Replacements	**Replacements (in cars)**	
Replacements of TGV PSE with Duplex; intercity coaches with IHST	Since 2014	[redacted]
Withdrawl of TGV Atlantique expected, TGV M being introduced	Until 2030*	
Infrastructure	**New HSR km**	
Opening of lines to Bretagne and Bordeaux with large procurements	Since 2014	
Smaller extensions e.g. Toulouse, early 2030 larger expansions	Until 2030*	
Transport market	**Transport development**	
Smaller growth, smaller increases: line to Bordeaux and low-cost HSR	CAGR 2017-2022	
Regulation for aviation, competition with Trenitalia, Renfe, LeTrain	CAGR 2022-2027*	
Liberalisation / Competition	**Share of competitors**	
Trenitalia has launched open access HSR, early stage of competition	2022	
Renfe and LeTrain to follow in OA; new market entrants possible	2030*	

*forecasted

[redacted]

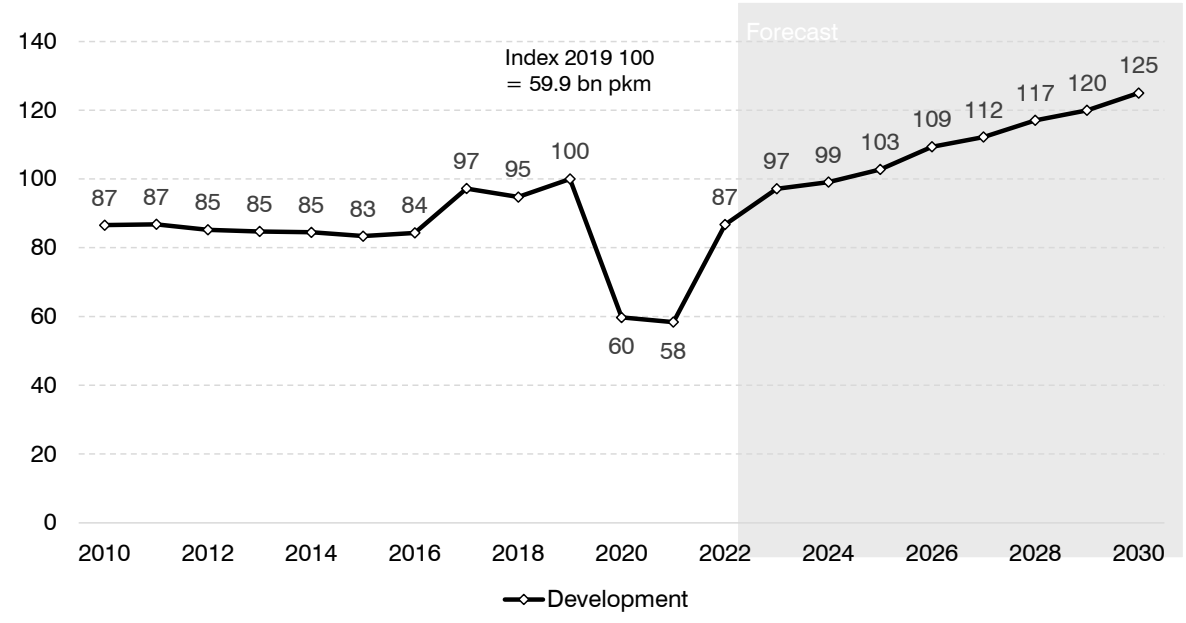
2.2.2 Market Overview

With the initial operation of the first “Ligne à Grande Vitesse” (high-speed line) with a newly developed multiple unit – the Train à Grande Vitesse (TGV, high-speed train) – in 1981, the age of high-speed rail began in Europe. Since then, France has not only been considered the European “motherland” of high-speed rail. The French approach has also developed very successfully in both technological and economic terms and has influenced the introduction of high-speed rail in numerous other nations.

Funding and political support for the rail sector was mostly allocated to HSR in the past, with various new infrastructure expansion having been introduced over the years. The current government has announced funding of EUR 100 billion for the national rail systems in February 2023 to encounter the climate crisis. Although the latest agendas most prominently aim to improve services in the width of the country by connecting more remote areas more frequently, it can still be assumed, that this agenda will also be in favour of HSR, as an improved regional rail service can be expected to nourish the French HSR system with additional passengers.

While the passenger transport performance of HSR in France has stagnated in the beginning of the 2010s, it increased since 2017 with the introduction of new infrastructure in Western France. For the nearer future, SCI Verkehr expects stronger growth rates than before, which can be traced back to initiating competition and increasing vehicle fleet size and vehicle capacities of SNCF, such as TGV M based on Alstom’s Avelia Horizon platform.

HSR passenger development in France (in pkm, index)



Quelle: UIC, TGV Services of SNCF for historical values, SCI Forecast

Figure 17: France: HSR passenger development

Competition / Liberalisation

The French HSR vehicle market has been until very recently solely controlled by its national incumbent SNCF. Although few operators from neighbouring countries have deployed HSR services within France for several years already, these services were exclusively offered in cooperation with SNCF. Only in December 2021, Italian Trenitalia launched HSR services from Paris to Milan as open access services in France and become the first operator in direct competition to SNCF. With the market liberalisation in neighbouring France, SNCF has launched services of its low-cost subsidiary Ouigo in Spain. In consequence Spanish incumbent RENFE currently runs test trials for services in France as direct competition no longer cooperating but competing with SNCF on different routes, particularly in

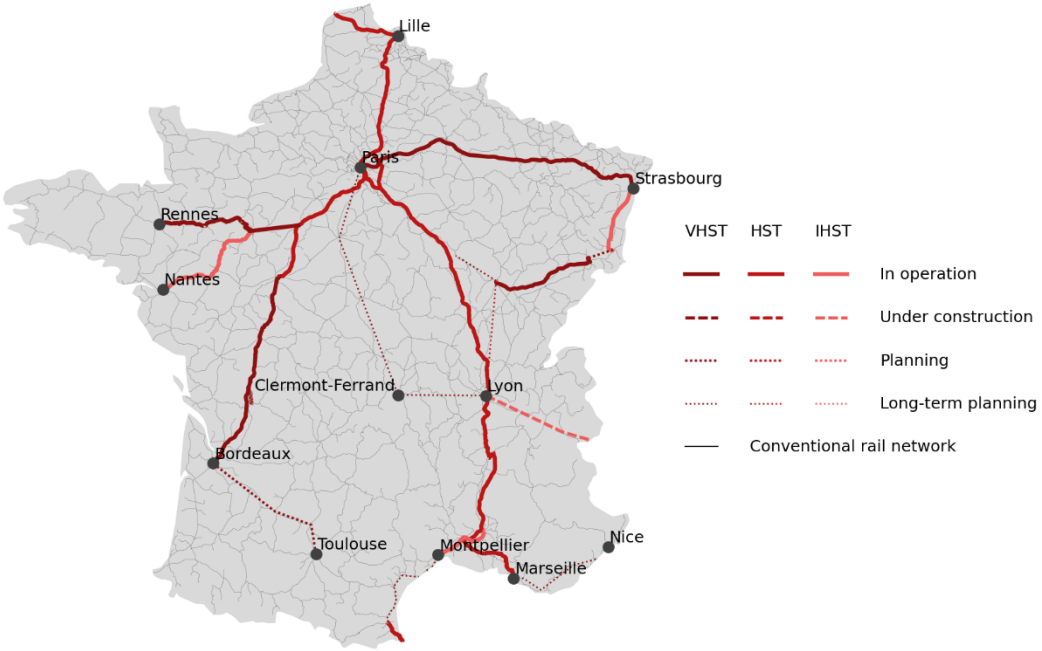
Southern France. In 2023, the new market entrant LeTrain has announced to order up to [redacted] VHST from Talgo for services on the LGV Atlantique from 2025 onwards.

Although these developments underline an initiating competition on the French HSR infrastructure, which still provides capacity for other competitors outside the main corridor LGV Sud-Est. However, unlike in Spain or Italy track access charges for HSR services in France are the highest in Europe which still impedes competition on a larger scale and hinders other competitors to enter the market. Unlike for freight rail where track access charges were reduced, reductions have not been announced for HSR services.

2.2.3 Infrastructure

On the one hand, French high-speed rail is offered on radial new lines (ligne à grande Vitesse, LGV) centred on Paris and, on the other hand, on conventional but often upgraded lines. As the high-speed rail pioneer in Europe, France had the second largest HSR network in the world behind Japan for a long time. Initially taken over by Spain and China, France still has one of the largest networks in the world with more than [redacted] route-km. In total, the network is divided into ten larger routes.

HSR infrastructure map France (by speed and status)



Source: UIC, SCI Database

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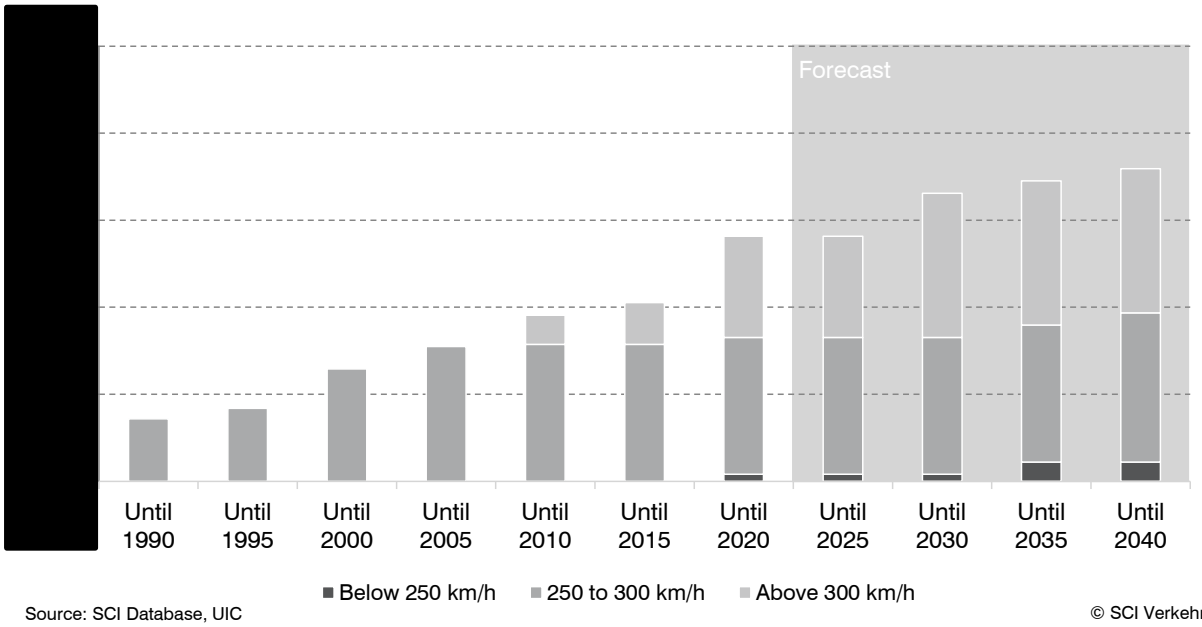
Figure 18: France: Current and planned highspeed infrastructure network

The overview of high-speed infrastructure to be implemented in the nearer future includes around [redacted] km of new high-speed lines to be introduced before 2030, resulting in additional HSR vehicle demand. Past 2030, the introduction of new international HSL is expected to further promote the vehicle demand in the country.

Development of HSR infrastructure in France



Source: SCI Database, UIC

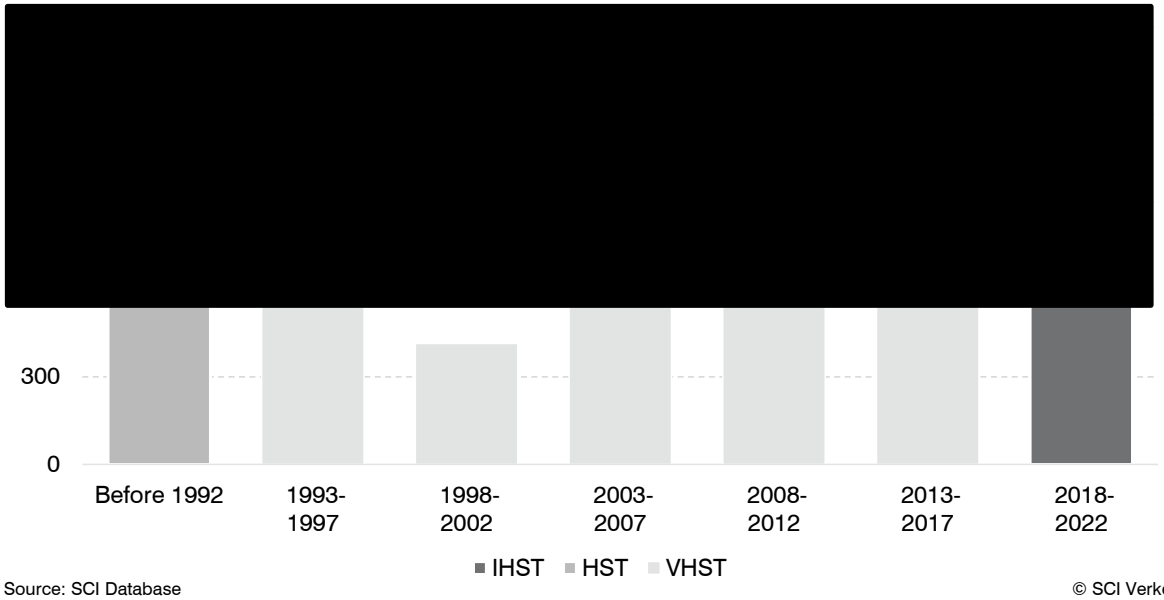
Figure 19: France: Highspeed infrastructure development in France

2.2.4 Fleet

France – Fleet segmentation of the installed base				
Segment	**Fleet size** (units)	**Fleet size** (cars)	**Cars per unit** (average)	**Average fleet age** (years)
IHST	[redacted]	[redacted]	9.4	[redacted]
HST	[redacted]	[redacted]	12.0	[redacted]
VHST	[redacted]	[redacted]	9.9	[redacted]
Total	[redacted]	[redacted]	**10.2**	**17.0**
				© SCI Verkehr GmbH

The fleet currently comprises around [redacted] trainsets with more than [redacted] cars. The average age is 17 years and has reduced with the phasing out of the first TGV generation PSE. HSR vehicle procurements in France have peaked before 1992 as well as in the past five years when more than 1300 units were delivered.

Age distribution of HSR fleet in France (in cars, 2022)



Source: SCI Database

Figure 20: France: Age distribution of HSR fleet

The French HSR fleet currently comprises the following models:

Series	TGV Atlantique	TGV Réseau	TGV Duplex	TGV POS
Picture[1]				
Manufacturer	Alstom	Alstom	Alstom	Alstom
Platform	Atlantique	Réseau	Duplex	POS
SCI Subsegment	HST	VHST	VHST	HST
Initial operation	1989	1992	1995	2006
Number of units	[redacted]	[redacted]	[redacted]	[redacted]
Number of cars	[redacted]	[redacted]	[redacted]	[redacted]
Train length (m)	238	200	200	200
Drive mechanism	Powerhead	Powerhead	Powerhead	Powerhead
Vmax (km/h)	300	320	320	320
Power (kW)	8,800	8,800	8,800	9,600
Homologations	FR	BE, FR	BE, CH, DE, ES, FR,	CH, DE, FR

Outside the HST and VHST segment there are two types of IHST being operated in France. In addition, there are two new VHST models to be introduced in the nearer future.

[1] All displayed pictures are not property of SCI Verkehr and were retrieved from the respective Wikipedia page. Pictures were clipped.

France – Overview of HSR vehicle procurement projects

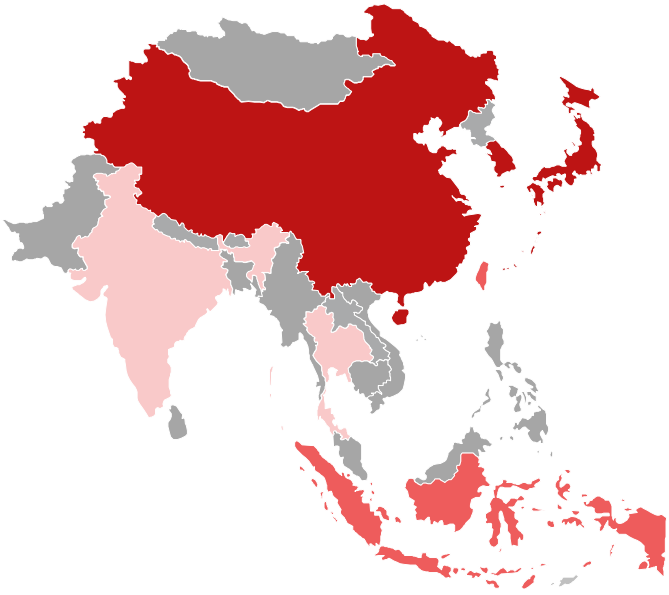
Segment	Type	Supplier	Status	Amount (units)	Delivery (from - to)	Description
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
VHST	TGV Duplex	Alstom	delivered	12	2021 - 2022	French state railway SNCF has ordered 12 additional high-speed trains (VHST) of the type Avelia Euroduplex from rolling stock manufacturer Alstom for EUR 335 million, in addition to 55 VHSTs that are currently being delivered. A first order for 40 VHSTs had been signed with SNCF in September 2013, and 15 additional vehicles were ordered in 2017. By the end of July 2019, a total of 41 VHSTs had been delivered, with the first ones entering commercial service on 11th December 2016 between Paris and Bordeaux.
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
			Options	75	2024 - 2029	
VHST	Avelia Horizon	Alstom	contracted	[redacted]	[redacted]	The rolling stock manufacturer Alstom has started production at its La Rochelle plant of the [redacted] Avelia Horizon very high-speed trains (VHST) to be delivered to the French state railway SNCF from [redacted]. The passenger coaches will be produced in La Rochelle and the first one is expected to be ready in November 2020. The power cars will be produced in Belfort and the first one is expected to be completed in September 2020. SNCF plans to put the trains with a top speed of 350 km/h into service as TGV-M from June 2024. There are remaining options for up to [redacted] additional Avelia Horizon to
			options	[redacted]	[redacted]	

France – Overview of HSR vehicle procurement projects

Segment	Type	Supplier	Status	Amount (units)	Delivery (from - to)	Description
						exploit new infrastructure such as LGV Centre France.
VHST	Avelia Horizon	Alstom	contracted	15	2024 - 2027	Rolling stock manufacturer Alstom has signed a EUR 590 million contract with French state railway SNCF for the delivery of an additional [redacted] Horizon from a contract signed in July 2018.
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

3 Asia

3.1 Total Market



Passenger transport market (2022)	
Mainline railway network (km)	[redacted]
Total transport performance (million pkm)	[redacted]
Rail modal share (%)	[redacted]
Share of PSO (%)	[redacted]
Share of Open Access (%)	[redacted]

Fleet →	Size (units)	Avg. age (years)	Trend (2022-2027)
IHST	[redacted]	[redacted]	→
HST	[redacted]	[redacted]	→
VHST	[redacted]	[redacted]	↗
Total	[redacted]	[redacted]	↗

OEM ↗	Market volume (EUR million) 2022	2027	CAGR (2022-2027)
Total	[redacted]	[redacted]	[redacted]

After-sales →	Market volume (EUR million) 2022	2027	CAGR (2022-2027)
Total	[redacted]	[redacted]	[redacted]

3.2 Market Overview in other regional markets

3.2.1 Thailand

Market Volume & Development

Thailand – Market volume & Development for HSR vehicles		
Indicator	**New Vehicles (OEM)**	**After Sales**
Average annual volume 2021-2023 (in EUR)	0 million	0 million
Average annual volume 2022-2027 (in EUR)	[redacted]	[redacted]
Future trend	→	↗

With the currently planned infrastructure in 2026 and 2027 respectively, annual market volumes of EUR [redacted] million can be expected in Thailand until 2030. Also for early 2030, new deliveries can be expected if current time schedules will be met. The expansion of infrastructure is the sole driver of vehicles procurement in Thailand.

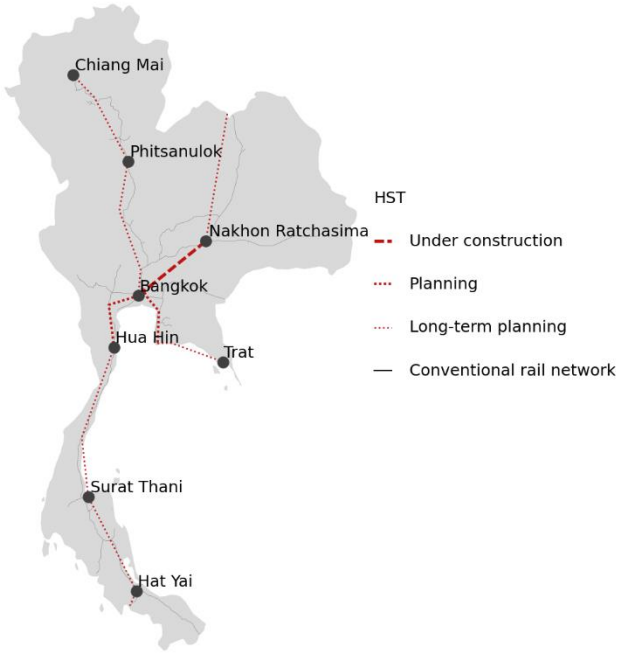
Generally, it is very difficult to forecast the further development of Thailand, as it depends on the inner political support of the financially extensive projects as well as support by foreign investors. If announced infrastructure expansion however are implemented as current time schedules suggest, annual OEM market volumes of EUR [redacted] million are not unlikely throughout the early 2030s also.

Market Overview / Infrastructure

In Thailand, there have been plans to construct a high-speed network for years with according announcements of upcoming projects. Following negotiations with China and Japan, implementations have proceeded with a Chinese partnership. The proposals various routes, all radiating from Bangkok.

– To the North to Chiang Mai
– To the Northeast to Nong Khai and Ubon Ratchathani
– To the East to Chanthaburi and Aranyaprathet
– To the South to Padang Besar via Hua Hin, Chumpon, Surat Thani and Hat Yai

HSR infrastructure map Thailand (by speed and status)



Source: UIC, SCI Database

Figure 81: Thailand: Planned highspeed infrastructure network

For the expansion of the national rail and HSR system, a new central station (Krung Thep Aphiwat Central Terminal) for the capital of Bangkok has been introduced in January 2023. Thailand currently plans to introduce its first HSR infrastructure connecting the capital Bangkok to Nakhon Ratchasima in the East of the country. According to the latest reports, construction is currently behind schedule, questioning the competition in 2026.

Consecutive projects such as the 3 Airport Link in the Bangkok metropolitan area and the first section of the Southern line to Hua Hin are likely to be delayed with their completion also, as this stage no contracts for construction have been awarded yet.

Fleet

Thailand currently does not operate HSR rolling stock. First deliveries from CRRC are expected by 2025.

Manufacturers

The following HSR vehicle procurement projects have lately been recorded in Thailand.

Thailand – Overview of HSR vehicle procurement projects						
Segment	**Type**	**Supplier**	**Status**	**Amount** (units)	**Delivery** (from - to)	**Description**
HST	CR300	CRRC	contracted	[redacted]	[redacted]	For the first phase of HSR infrastructure in Thailand connecting Bangkok and Nakhon Ratchasima and the three airports around Bangkok an initial delivery for 15 units has been contracted to CRRC.
HST	Exposed	Exposed	Expected projects	[redacted]	[redacted]	With the further expansion of the Thai HSR infrastructure SCI Verkehr expects further deliveries of HST in the early 2030s.
						© SCI Verkehr GmbH

With the initial deliveries from CRRC planned in 2025 and the Chinese Thai partnership for the construction of the first HSL in Thailand, market entry for other manufacturers is likely to be hindered.

4 Annex

4.1 Highspeed rail infrastructure lines list by country

Denmark

Project title	Distance in km	Max. speed (km/h)	(Expected) completion	Project status
Copenhagen – Malmö	36	250	2000	In operation
Copenhagen – Ringsted	60	250	2019	In operation
Fredericia – Aarhus	108	200	2026	Under construction
Ringsted – Odense	100	200	2027	Under construction
Ringsted - Rodby	119	200	2028	Under construction
Odense – Fredericia	50	200	2028	Under construction
Fehmarn belt tunnel	18	200	2029	Under construction

Uzbekistan

Project title	Distance in km	Max. speed (km/h)	(Expected) completion	Project status
Tashkent - Samarkand	344	250	2011	In operation
Samarkand - Buxoro	270	250	2021	In operation
Buxoro - Khiva	452	250	2025	Under construction

Vietnam

Project title	Distance in km	Max. speed (km/h)	(Expected) completion	Project status
Hanoi - Vinh	295	350	2032	Planing
Nha Trang - Hô Chi Minh	430	350	2032	Planning
Vinh - Nha Trang	1,000	350	2050	Long-term planning