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**ETCS DEVELOPMENT UNTIL 2030
IN EUROPE**

Wayside and on-board new installations

2022



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ETCS DEVELOPMENT UNTIL 2030 IN EUROPE

Wayside and on-board new installations

Cologne, May 2022

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Austria: ETCS DEVELOPMENT UNTIL 2030 IN EUROPE

2 Market for ETCS new installations in focus countries

2.1 Austria

Consideration of ETCS deployment in Austria is limited to infrastructure owned by ÖBB Infrastructure. The respective network has a length of XXX km of which XXX km are equipped with ETCS as of today. Due to the comprehensive plans by ÖBB Infrastructure and the Austrian government, XXX km should be equipped with ETCS by 20XX. This encompasses the European corridors as well as all relevant lines. An exact date for the decommissioning of the PZB system has not been set yet. Despite this, the ETCS on board share is already rather high, as it amounts to XX%. Until 20XX, a share of XX% is expected while the largest absolute and relative increase will be seen for XX.

2.1.1 Infrastructure

Class B system(s)

Two different proprietary class B system exist in the Austrian network which is mostly operated by the national infrastructure operator ÖBB Infrastruktur AG.

- PZB (“punctiform train influencing”): cab signalling and train protection system of the family of the intermittent systems based on a magnet installed on the track. If the train goes too fast, the system brakes it. PZB is mandatory for nearly every railway line (conventional railway) in Austria.
- LZB (“linear train influencing”): continuous train control system specific for trains allowed to exceed speeds of 160 km/h. Data transmission occurs through a cable between the rails. The train / driver is warned if the maximum speed is exceeded, and the train is automatically braked. LZB is installed on the Westbahn line including St. Pölten – Ybbs an der Donau, Amstetten – Linz Kleinmünchen, Linz main station – Attnang-Puchheim.

European corridors

All TEN-T corridors on Austrian territory should be equipped with ETCS by 20XX, but RFC XX will only be fully equipped by 20XX. The same applies to some alternative routing (e.g., XX).

- RFC 3 Scandinavian-Mediterranean: the corridor crosses the western part of Austria in north-south direction, from the German border at Kufstein via Innsbruck to the Italian border near Steinach (Brenner). The sections XX (XXX km) are already equipped with ETCS. Deployment for the track XX is scheduled for 20XX and for the track XX (XXX km) for 20XX. RFC 3 encompasses the new Brenner Base Tunnel (30 km) as well which will be opened in 2032 and directly be equipped with ETCS.
- [...]

ETCS installations

According to the network operator ÖBB Infrastructure, almost XXX track km of ETCS level 2 are in operation.

Section	Level	Baseline	Network length [km]	Implementati on finalized	Supplier	Remark
Junction Wagram – Junction Rohr	2		25	2018	Thales	
Vienna-Simmering – Süssenbrunn	2	2.3.0d	20	2014	-	
[...]						
Total			XXX			

ETCS implementation plan / Market size and outlook

According to the National Implementation Plan and the strategy of ÖBB Infrastructure, the goal is to equip XXX line-km out of the XXX km of ÖBB's railway network with ETCS level 2 until 20XX. Already detailed planning exists for this process. All in all, equipment of Austrian railway network is expected to increase strongly until 20XX and from there on grow at a smaller but continuous scale. The expansion of the ETCS equipment will be done through three implementation phases:

[...]

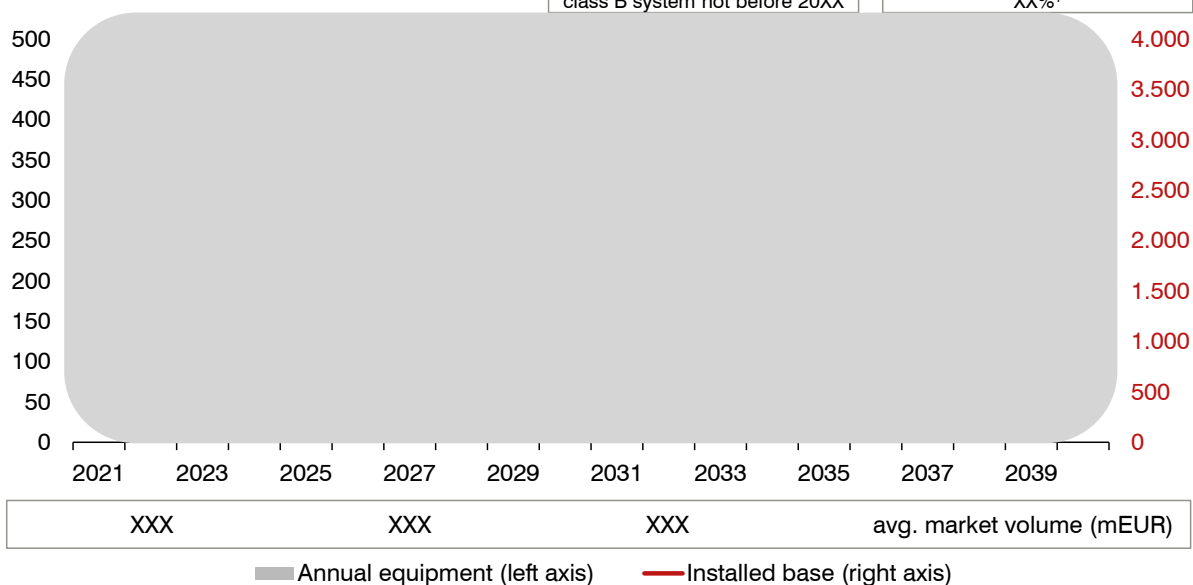
Parallel operation of ETCS and class B system for a period of approximately XXX years after ETCS implementation is planned. An exact date for the decommissioning of the PZB system has not been set yet. LZB decommissioning on the XX line is scheduled for 20XX and on the XX line by 20XX.

ETCS wayside market development Austria

(track km p.a. and mEUR p.a.)

Planned decommissioning of class B system not before 20XX

Share of equipment in 2040 XX%¹



Remark: All numbers rounded. ¹Incumbent network only.

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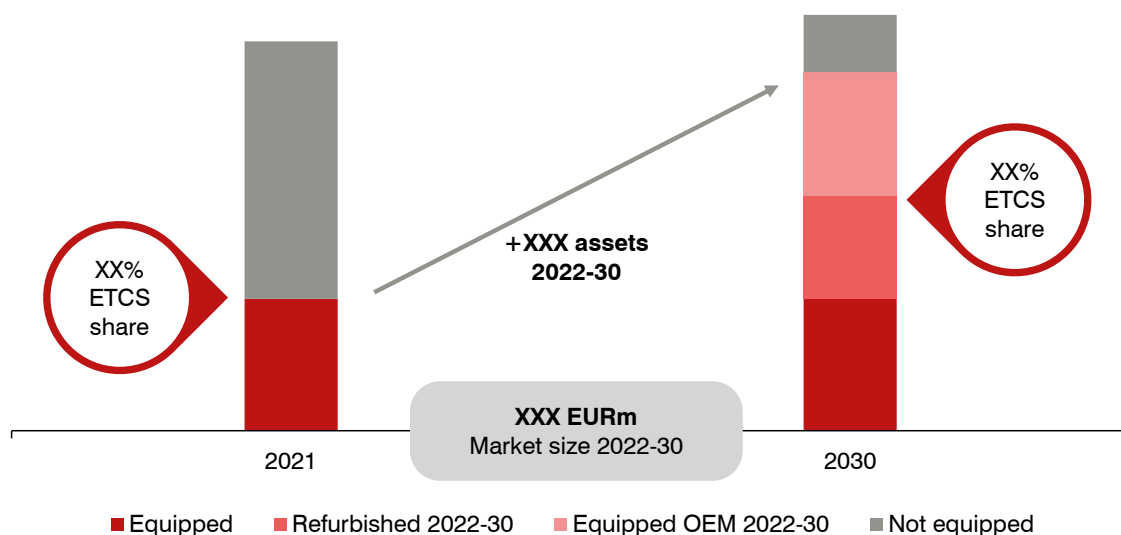
Figure 11: ETCS wayside market development Austria

2.1.2 Rolling Stock

State of equipment and outlook

The regarded rolling stock fleet in Austria encompasses ~XXX vehicles of which XX% are already equipped with ETCS. By taking a deeper look, it becomes obvious that there are great differences between the vehicle types: Regarding high-speed trains, XXX units are already equipped with ETCS. In the segment of locomotives, around XXX out of XXX units (XX%) are equipped with ETCS today. For example, ÖBB tendered ETCS equipment for ~XXX locomotives as well as control cars in 20XX. The contract was won by XX. In 20XX, ÖBB signed a frame contract to purchase up to XXX locomotives. A significant share of these locomotives is / will be directly equipped with ETCS. Only multiple units lag significantly behind (XXX out of XXX units).

ETCS on-board market development Austria (units and mEUR)



Remark: All numbers rounded.

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Figure 12: ETCS on-board market development Austria

SCI Verkehr expects that the ETCS share is going to rise from XX% today to XX% in 2030. This goes along with the equipment of an additional XXX assets of which XXX will be retrofitted and XXX will be new deliveries directly equipped with ETCS. The respective market volume amounts to EUR XXX million in total.

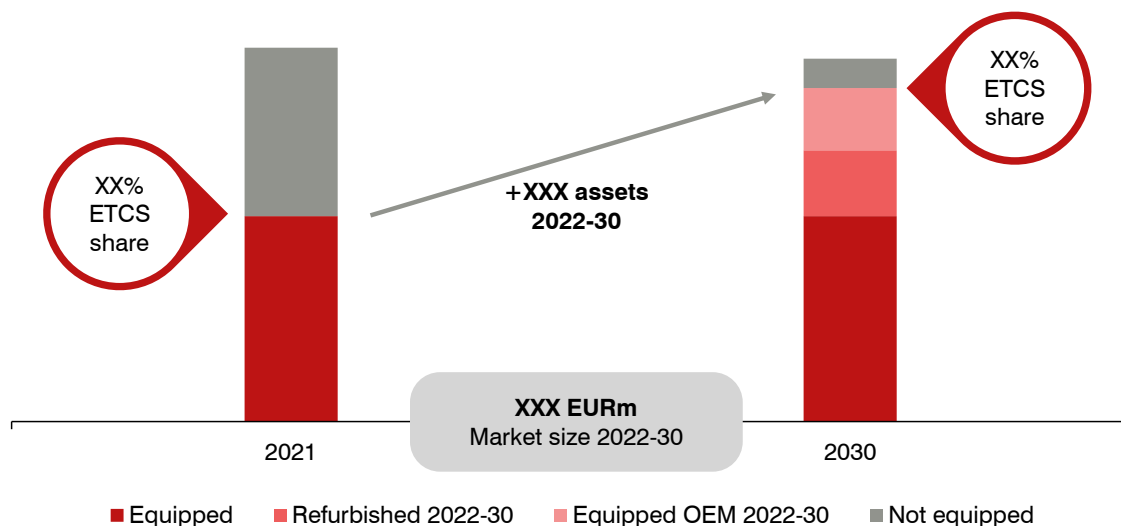
Public funding

The European Commission (EC) approved a state funding programme by the Austrian government in September 2011 (SA.33381). The programme was implemented to support the equipment of ETCS on-board units on railway vehicles operating in Austria. Interested parties could apply for financial support between December 2011 and December 2014, whereas the pay-out should be finished until December 2017. The total budget of the program was EUR 45 million. [...]

Market size and outlook for single vehicle types

The ETCS share of locomotives is expected to rise from currently XX% to XX% in 2030 which means the equipment of additional XXX assets. Refurbishment and new deliveries will be split almost 50:50. The market volume is EUR XXX million. For example, around XXX existing locomotives by ÖBB should be refurbished in a timely manner.

Locomotive ETCS on-board market development Austria
(units and mEUR)



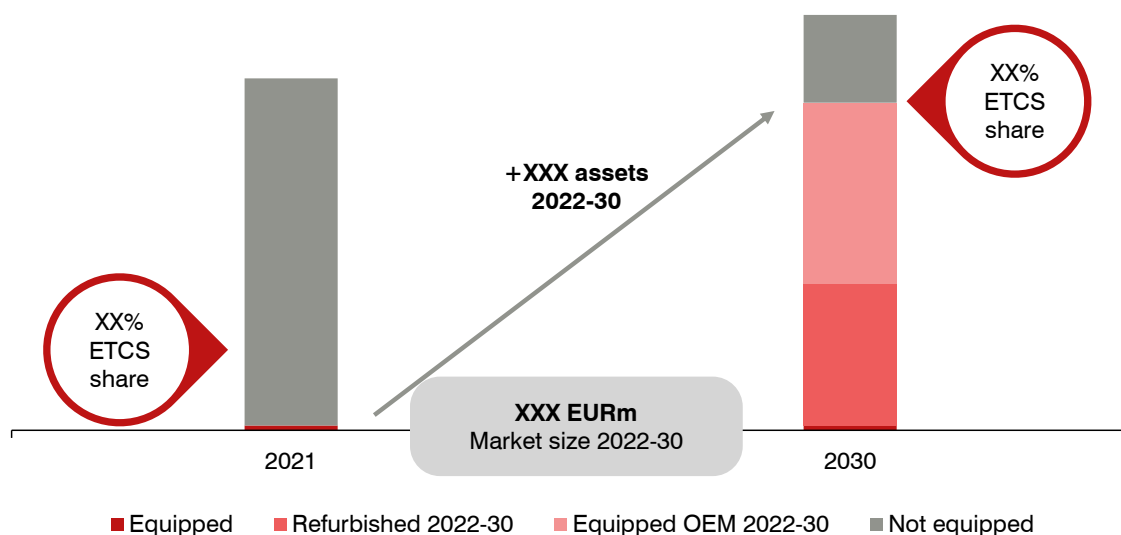
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Figure 13: Locomotive ETCS on-board market development Austria

Given the low ETCS share of multiple units today, it is no surprise that this segment will be the most important until 2030. SCI Verkehr expects the equipment of additional XXX units out of which XX% will be refurbished and XX% equipped OEM. This leads the ETCS share to rise from XX% to XX%, resulting in a market volume of EUR XXX million. For example, XXX EMUs of type XX owned by ÖBB will be equipped with ETCS by the end of 20XX.

Multiple unit ETCS on-board market development Austria
(units and mEUR)



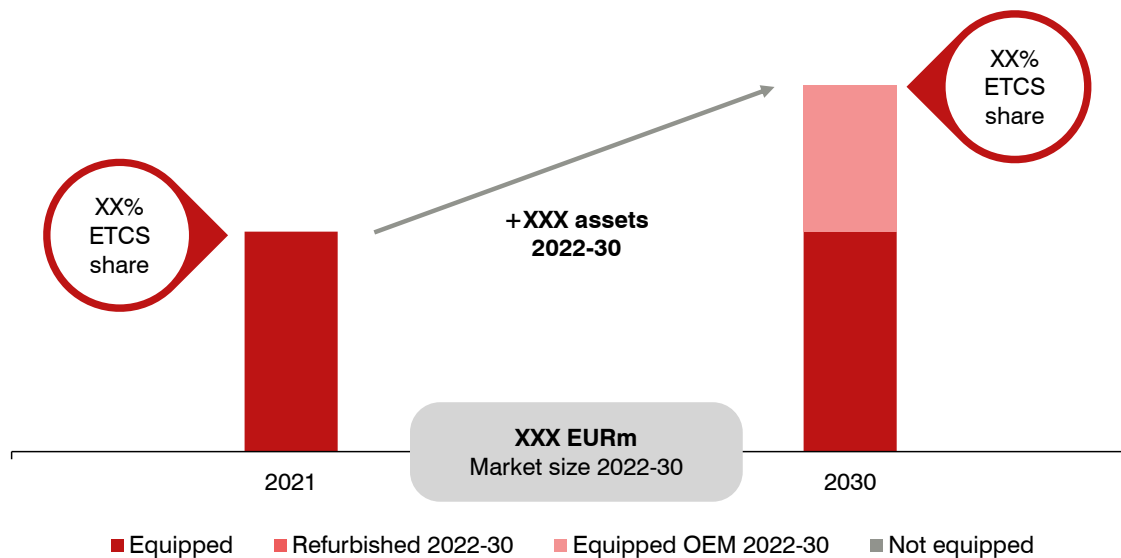
Remark: All numbers rounded.

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Figure 14: Multiple unit ETCS on-board market development Austria

In the high-speed segment, the ETCS share will be XX%. An additional new ~XX assets will be delivered until 2030 and directly be equipped with ETCS. The market volume is therefore rather small and amounts to about EUR XX million.

HST ETCS on-board market development Austria
(units and mEUR)



Remark: All numbers rounded.

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Figure 15: HST ETCS on-board market development Austria

