EUROFIMA
ROLLING STOCK FINANCING

ANNEX 3

LIST OF DATA SOURCES & MODEL FOR AVAILABLE SEATS ESTIMATE

GREEN BOND IMPACT REPORTING

MARCH 2026

DATA SOURCES

List of the data sources EUROFIMA used to produce the Impact Report.

Source of data (1/2)

Factor	Short name	Source	Page	Value
Average Auto Consumption - Motorway	ACM	Ecopassenger Methodology Report	Page 17	
Average Auto Consumption - Rural	ACR	Ecopassenger Methodology Report	Page 17	
% of time traveled in a Motorway	TM%	Assumption		50%
% of time traveled in Rural roads	TR%	Assumption		50%
Average Auto Consumption - Travel	ACT	Calculated		
Average Diesel Auto Consumption – Travel	ACTD	Calculated		4.9 l/100km
Average Petrol Auto Consumption – Travel	ACTP	Calculated		6.7 l/100km
% of Diesel cars in the European Fleet	DC%	ACEA (fleet type)		42%
% of Petrol cars in the European Fleet	PC%	ACEA (diesel vs petrol)		53.9%
Average car weight		European vehicle market statistics	Page 53	1395 kg
Average Auto Consumption	AC	Calculated		5.9 l/100km
Passengers per kilometer by country/mode of operations	pkmC	Eurostat - Rail transport of passengers SCI Verkher GmbH		
Passengers per kilometer by item of equipment	pkmT	Calculated		
Available seats by country/mode of operations	AvSC	SCI Verkher GmbH		
Available seats by specific item of equipment	AvST	Railways/Manufacturer data sheet Specific model for Loco-Coaches formation		
Numbers of specific green items	#ST	Project		
Baseline GhG emissions per pkm, avoided	EBA	EU Taxonomy	Art. 24.1, Page 329	290 gCO_2/vkm
Baseline GhG emissions per pkm, reduced	EBR	EU Taxonomy	Art. 24.1, Page 329	90 gCO_2/pkm
Passenger per vehicle	PV	Ecopassenger		1.5
Project savings (CO_2) as reduced emissions	PSCDR	Calculated		
Project savings (CO_2) as avoided emission	PSCDA	Calculated		
CH_4 emitted by energy unit- Petrol	CKwhP	UK Gov- GG Reporting- Conversion factors	See table «Conversion factors 2020: condensed set (for most users)»	0.00071 kg/kWh
CH_4 emitted by energy unit- Diesel	CKwhD	UK Gov- GG Reporting- Conversion factors	See table «Conversion factors 2020: condensed set (for most users)»	0.00002 kg/kWh
N_2O emitted by energy unit- Petrol	NKwhP	UK Gov- GG Reporting- Conversion factors	See table «Conversion factors 2020: condensed set (for most users)»	0.00064 kg/kWh
N_2O emitted by energy unit- Diesel	NKwhP	UK Gov- GG Reporting- Conversion factors	See table «Conversion factors 2020: condensed set (for most users)»	0.00331 kg/kWh
Project savings (CH_4) as avoided emissions	PSMHA	Calculated		
Project savings (CH_4) as reduced emissions	PSMHR	Calculated		
Project savings (N_2O) as avoided emissions	PSNOA	Calculated		
Project savings (N_2O) as reduced emissions	PSNOR	Calculated		
Diesel Heating Value-by Kg		Heating values		45.5 MJ/Kg
Energy consumption baseline per pkm, car	JBC	Mobitool.ch		1.30 MJ/pkm
Energy consumption baseline per pkm, diesel equipment	JBD	Ecopassenger Methodology Report	Page 18	1.15 MJ/pkm
Average Energy Consumption of the Green Asset per Pkm (CH,AT,DE, FR,IT)	JGA	Mobitool.ch		
Average Energy Consumption of the Green Asset per Pkm (Other country)	JGA	Ecopassenger Methodology Report	Page 18	0.32 Mj/pkm

DATA SOURCES

List of the data sources EUROFIMA used to produce the Impact Report.

Source of data 2/2)

Factor	Short name	Source	Page	Value
Project savings as reduced energy consumption	PSJR	Calculated		
Project savings as avoided energy consumption	PSJA	Calculated		
Heating value by liter -Petrol	HVP	Heating values		33.9 MJ/l
Heating value by liter- Diesel	HVD	Heating values		36.7 MJ/l
Reduction in fuel consumption- Avoided	RFCA	Calculated		
Reduction in fuel consumption- Reduced	RFCR	Calculated		

MODEL TO ESTIMATE THE SEATS TO BE ALLOCATED TO LOCOMOTIVES

E464

Type of coaches		# of seats					# of coaches							Unitary market value						
Type of coaches	% of usage	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Seats (whole formation)	Seats weighted by loco Value	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
NCDP	50.0%	126	90	90			3	1	1			1	558	172.9	640,857 €	659,328 €	769,078 €			1,504,762 €	4,855,737 €
CDPTR	50.0%	126	90	90			3	1	1			1	558	129.8	953,177 €	978,250 €	1,128,066 €			1,504,762 €	6,470,608 €

E464 - # of weighted seats	**151.3**

E403 FS

Type of coaches		# of seats					# of coaches							Unitary market value						
Type of coaches	% of usage	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Seats (whole formation)	Seats weighted by loco Value	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
IC MOD	100.0%	78	52	64	35		3	2	1			1	402	213.0	224,848 €	228,663 €	768,321 €			2,141,433 €	4,041,623 €

Class E403 FS - # of weighted seats	**213.0**

E401 FS

Type of coaches		# of seats					# of coaches							Unitary market value						
Type of coaches	% of usage	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Seats (whole formation)	Seats weighted by loco Value	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
IC MOD	100.0%	78	52	64			4	2	1			1	480	146.0	224,848 €	228,663 €	768,321 €			928,483 €	3,053,521 €

Class E401 FS - # of weighted seats	**146.0**

E414

Type of coaches		# of seats					# of coaches							Unitary market value						
Type of coaches	% of usage	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Seats (whole formation)	Seats weighted by loco Value	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
IC MOD	100.0%	78	52	64			5	3				1	546	170.3	224,848 €	228,663 €	768,321 €			820,650 €	2,630,877 €

Class E414 - # of weighted seats	**170.3**

MODEL TO ESTIMATE THE SEATS TO BE ALLOCATED TO LOCOMOTIVES

E402 B FS

Type of coaches		# of seats					# of coaches							Unitary market value						
Type of coaches	% of usage	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Seats (whole formation)	Seats weighted by loco Value	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
IC MOD	100.0%	78	52	64	35		4	2	1			1	480	163.0	224,848 €	228,663 €	768,321 €			1,092,248 €	3,217,286 €

Class E402 B FS - # of weighted seats	163.0

Class HLE 18

Type of coaches		# of seats					# of coaches							Unitary market value						
Type of coaches	% of usage	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Seats (whole formation)	Seats weighted by loco Value	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
M6	100.0%	140	124	136			5	2	1			1	1084	250.0	991,193 €	1,014,887 €	1,436,668 €			2,524,596 €	10,947,000 €

Class HLE 18 - # of weighted seats	250.0

Class HLE 19

Type of coaches		# of seats					# of coaches							Unitary market value						
Type of coaches	% of usage	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Seats (whole formation)	Seats weighted by loco Value	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
M6	100.0%	140	124	136			5	2	1			1	1084	239.5	991,193 €	1,014,887 €	1,436,668 €			2,389,216 €	10,811,621 €

Class HLE 19 - # of weighted seats	239.5

MODEL TO ESTIMATE THE SEATS TO BE ALLOCATED TO LOCOMOTIVES

A locomotive does not carry passengers directly. Consequently, the number of seats that can be attributed to a locomotive — as a basis for estimating passenger-kilometres (pkm) — can only be derived from a typical locomotive–passenger coach formation.

The following methodological steps are applied:

a) The typical train formation associated with the locomotive is defined based on information provided by the railway operator. This includes identifying the specific passenger coach types (class and configuration) composing the formation, as well as the number of units for each coach type.

b) The total seating capacity of the formation is then calculated by summing the number of seats available in each passenger coach type.

c) The share of seats attributable to the locomotive is subsequently estimated on a pro rata basis using the relative market value of the locomotive compared with the total market value of the entire formation (i.e., locomotive market value divided by total formation market value).

It should be noted that the "typical formation" used for the estimation represents a simplification of operational reality. In practice, a locomotive may operate with several different formations, which may vary in coach class, type, and number of passenger cars. In order to avoid unnecessary complexity — which would not materially improve the robustness of the results — the analysis relies on the most frequently used formation.

The methodology is illustrated below using the FS E464 locomotive as an example. The same approach is applied to all other locomotives.

1) Identification of formations and usage share

First, the passenger coach types associated with the locomotive and their relative utilisation are defined. The E464 operates with Vivalto passenger coaches, with approximately 50% of the mileage using the NCDP configuration and the remaining 50% the CDPTR configuration.

Each formation consists of: three second-class coaches (126 seats each), one first-class coach (90 seats),one driving trailer (90 seats).

2) Calculation of formation seating capacity and market value

The total number of seats per formation is then calculated. For example, the formation with NCDP coaches provides:

126×3+90×1+90×1=558 seats.

At the same time, the market value of each formation component — both passenger coaches and locomotive — is determined using the proprietary EUROFIMA valuation model developed in cooperation with SCI Verkehr.

In this example, the total value of the formation with NCDP coaches is EUR 4,855,737, while the market value of the E464 locomotive is EUR 1,504,762.

3) Allocation of "weighted seats" to the locomotive

The number of seats attributable to the locomotive is then calculated by allocating seats proportionally to the locomotive's share of the formation's market value.

For the NCDP formation, this results in: 558÷4,855,737×1,504,762=172.9 seats.

4) Calculation of the average seats attributable to the locomotive

Finally, the average number of seats attributed to the E464 locomotive is estimated by weighting the seats derived from each formation by their respective utilisation frequency. For example:

172.9×50%+129.8×50%=151.3 seats

MODEL TO ESTIMATE THE SEATS TO BE ALLOCATED TO PASSENGERS CARS

NCDP

	# of seats					# of coaches							Unitary market value						
	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Seats (whole formation)	Loco	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
	126	90	90			3	1	1			558	E464 1	640,857 €	659,328 €	769,078 €			1,504,762 €	4,855,737 €
NCDP - # of weighted seats	73.6	75.8	88.4	0	0														

CDPTR

	# of seats					# of coaches							Unitary market value						
	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Seats (whole formation)	Loco	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
	126	90	90			3	1	1			558	E464 1	953,177 €	978,250 €	1,128,066 €			1,504,762 €	6,470,608 €
CDPTR - # of weighted seats	82.2	84.4	97.3	0	0														

IC-MOD

	# of seats					# of coaches							Unitary market value						
	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Seats (whole formation)	Loco	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
	78	52	64			4	2	1			480	E402 B FS 1	224,848 €	228,663 €	768,321 €			1,092,248 €	3,217,286 €
IC-MOD - # of weighted seats	33.5	34.1	114.6	0	0														

UIC Z1 FS

	# of seats					# of coaches							Unitary market value						
	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Seats (whole formation)	Loco	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
	66	54	64			4	2	1			436	E402 B FS 1	121,462 €	124,346 €	176,059 €			1,092,248 €	2,002,844 €
UIC Z1 FS - # of weighted seats	26.4	27.1	38.3	0	0														

MODEL TO ESTIMATE THE SEATS TO BE ALLOCATED TO PASSENGERS CARS

M6																			
	# of seats					# of coaches						Loco	Unitary market value						
	2nd class	1st class	Driving trailer	Dining car	Wagon lits	2nd class	1st class	Driving trailer	Dining car	Wagon lits	Seats (whole formation)		2nd class	1st class	Driving trailer	Dining car	Wagon lits	Loco	Formation value
	140	124	136			5	2	1			1084	Clas HLE 18 1	991,193 €	1,014,887 €	1,436,668 €			2,524,596 €	10,947,000 €

M6 - # of weighted seats	98.2	100.5	142.3	0	0

A passenger coach does not possess its own propulsion and always operates as part of a train formation coupled with a locomotive. Consequently, the number of seats attributable to a passenger coach — used as the basis for deriving passenger-kilometres (pkm) — can only be estimated within the context of a typical locomotive–passenger coach formation.

The following methodological steps are applied:

a) The typical formation associated with the passenger coach is first defined based on information provided by the railway operator. This includes identifying the locomotive type operating the formation as well as the specific passenger coach types (e.g., first class, second class, driving trailer) and the number of each coach type included in the formation.

b) The total seating capacity of the formation is then calculated by summing the number of seats available across all passenger coach types.

c) The seats attributable to each passenger coach type are subsequently estimated on a pro rata basis according to the relative market value of that coach type compared with the total market value of the entire formation (i.e., passenger coach market value divided by total formation market value).

It should be noted that the "typical formation" used in the estimation represents a simplification of operational reality. In practice, a passenger coach may operate within several different formations involving different locomotives and varying numbers and types of passenger coaches. To avoid unnecessary complexity — which would not materially improve the robustness of the results — the analysis relies on the most frequently used formation.

The methodology is illustrated below using the NCDP passenger coach as an example. The same approach is applied to all other passenger coach types.

1) Identification of the most common formation

First, the most common formation in which the NCDP coach operates is identified. In this case, the passenger coaches are coupled with an E464 locomotive, and the formation consists of: three second-class coaches (126 seats each), one first-class coach (90 seats),one driving trailer (90 seats). This configuration results in a total seating capacity of 558 seats.

2) Determination of formation market values

Next, the market value of each component of the formation — both locomotives and passenger coaches — is determined using the proprietary EUROFIMA valuation model developed in cooperation with SCI Verkehr.

In this example, the total market value of the formation is EUR 4,855,737, while the market value of a single second-class passenger coach amounts to EUR 640,857.

3) Allocation of "weighted seats" to the passenger coach

Finally, the number of seats attributable to each passenger coach type is calculated proportionally to its share of the total formation market value. For the second-class passenger coach, the resulting number of weighted seats is calculated as follows:

558×640,857x4,855,737=73.6

This value represents the seating capacity attributed to a single second-class passenger coach and is the parameter used in the emissions and energy-intensity calculations.

LIST OF AVAILABLE SEATS BY ASSET CLASS

Asset class	Asset Type	Type of passengers car	Seats
CDPTR DT	PC - Passenger car	Driving trailer	97.3
CDPTR IC	PC - Passenger car	Second class	82.2
CIVIA 463	EMU - Electrical multiple units train		169.0
CIVIA 464	EMU - Electrical multiple units train		223.0
CIVIA 465	EMU - Electrical multiple units train		277.0
CLASS 2400 CFL	EMU - Electrical multiple units train		334.0
CLASS 447 RF	EMU - Electrical multiple units train		234.0
CLASS 449	EMU - Electrical multiple units train		263.0
CLASS 640/2	EMU - Electrical multiple units train		221.0
CLASS 650/2	EMU - Electrical multiple units train		140.0
CLASS HLE 18	EL - Electrical locomotives		250.0
CLASS HLE 19	EL - Electrical locomotives		239.5
E401 FS	EL - Electrical locomotives		146.0
E402 B FS	EL - Electrical locomotives		163.0
E403 FS	EL - Electrical locomotives		213.0
E414	EL - Electrical locomotives		170.3
E464	EL - Electrical locomotives		151.3
ETR 324 JAZZ	EMU - Electrical multiple units train		202.0
ETR 425 JAZZ	EMU - Electrical multiple units train		290.0
ETR 526 JAZZ	EMU - Electrical multiple units train		326.0
HTR 312 BLUES	TMMU - Tri-mode multiple units train		224.0
HTR 412 BLUES	TMMU - Tri-mode multiple units train		306.0
IC MOD-INT	PC - Passenger car	Second class	33.5
IC MOD-INT 1ST	PC - Passenger car	First class	34.1
M6 SNCB	PC - Passenger car	Second class	98.2
M6 SNCB 1ST	PC - Passenger car	First class	100.5

Asset class	Asset Type	Type of passengers car	Seats
MINUETTO E	EMU - Electrical multiple units train		169.0
MR 08 DC	EMU - Electrical multiple units train		232.0
MR 08 MS B	EMU - Electrical multiple units train		232.0
NCDP DT	PC - Passenger car	Driving trailer	88.4
NCDP IC	PC - Passenger car	Second class	73.6
NCDP IC 1ST	PC - Passenger car	First class	75.8
RABDE 500	HST - High speed train		431.0
RABE 503	HST - High speed train		422.0
RABE 511-4	EMU - Electrical multiple units train		337.0
RABE 511-6	EMU - Electrical multiple units train		535.0
RABE 514	EMU - Electrical multiple units train		384.0
RABE 520	EMU - Electrical multiple units train		128.0
RABE 521	EMU - Electrical multiple units train		161.0
RABE 522	EMU - Electrical multiple units train		161.0
RABE 523	EMU - Electrical multiple units train		161.0
RABE 523 F3	EMU - Electrical multiple units train		161.0
RABE 524-4	EMU - Electrical multiple units train		182.0
RABE 524-6	EMU - Electrical multiple units train		250.0
RABE 524-6 F3	EMU - Electrical multiple units train		250.0
RABE 526-3	EMU - Electrical multiple units train		106.0
RABE 526-4	EMU - Electrical multiple units train		163.0
S-104	HST - High speed train		237.0
S-114	HST - High speed train		237.0
TAF FS	EMU - Electrical multiple units train		475.0
UIC Z1 FS DT	PC - Passenger car	Driving trailer	38.3