



ANNEX 3

LIST OF DATA SOURCES & MODEL FOR
AVAILABLE SEATS ESTIMATE

GREEN BOND IMPACT REPORTING
MARCH 2022

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	EU Statistical pocketbook 2019		
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		
Numbers of specific green items	#ST	Project		
Baseline GhG emissions per pkm, avoided	EBA	EU Taxonomy	Art. 24.1, Page 329	290 gCO2/vkm
Baseline GhG emissions per pkm, reduced	EBR	EU Taxonomy	Art. 24.1, Page 329	90 gCO2/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 ₂ O 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 ₂ O emitted by energy unit- Diesel	NKwhD	UK Gov- GG Reporting- Conversion factors	See table «Conversion factors 2020: condensed set (for most users)»	0.00331 kg/kWh
Project savings (CH4) as avoided emissions	PSMHA	Calculated		
Project savings (CH4) as reduced emissions	PSMHR	Calculated		
Project savings (N2O) as avoided emissions	PSNOA	Calculated		
Project savings (N2O) 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

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		

E464																
Type of coaches	2nd class Seats	1st class Seats	Driving trailer Seats	2nd class coaches - #	1st class coaches - #	% of usage	Seats (whole formation)	Seats weighted by loco Value	Unitary book value - Coaches	Unitary book value - Driving trailer	Unitary book value - Loco	Formation value	# green loco	# green coaches	# Complete formations	# Coaches left
MD	82	72	60	3	2	52.6%	450	180.0	157,433 €	1,196,284 €	1,322,854 €	3,306,303 €	246			
PR	100		76	5		15.8%	576	264.5	72,432 €	1,196,284 €	1,322,854 €	2,881,299 €	246			
Vivalto	126	90	90	3	2	31.6%	648	141.0	737,160 €	1,070,211 €	1,322,854 €	6,078,867 €	246	248	41	2

Seats of the average formation	532.4	181.0
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E403																
Type of coaches	2nd class Seats	1st class Seats	Driving trailer Seats	2nd class coaches - #	1st class coaches - #	% of usage	Seats (whole formation)	Seats weighted by loco Value	Unitary book value - Coaches	Unitary book value - Driving trailer	Unitary book value - Loco	Formation value	# green loco	# green coaches	# Complete formations	# Coaches left
IC - Gran comfort	74	52	59	5	3	35%	585	321.0	222,983 €	1,196,284 €	3,623,293 €	6,603,444 €	23			
UIC Z1	66	54	64	5	3	40%	556	266.0	344,418 €	1,196,284 €	3,623,293 €	7,574,916 €	23			

Seats of the average formation	427.2	218.7
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*Assumed that 25% of the loco run during the night and are excluded from the estimation

VECTRON AC DDK																
Type of coaches	2nd class Seats	1st class Seats	Driving trailer Seats	2nd class coaches - #	1st class coaches - #	% of usage	Seats (whole formation)	Seats weighted by loco Value	Unitary book value - Coaches	Unitary book value - Driving trailer	Unitary book value - Loco	Formation value	# green loco	# green coaches	# Complete formations	# Coaches left
Bombardier DD **	121	115	90	2	1	80%	447	199.7	1,300,000 €	NA	4,200,000 €	9,400,000 €	44			
Bombardier DD **	121	115	90	3	2	20%	683	239.1	1,300,000 €	NA	4,200,000 €	12,000,000 €	44			

Seats of the average formation	494.2	207.6
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*Assumed that the unitary price is 4,2 ML€ (from IRJ value of the same type of Loc used in Finland)

**Assumed that the unitary price is 1.3 ML€ (taken from the similar coach of CLF, ERMS data coming from CFL itself); configuration is based on DSB data (<https://www.dsb.dk/om-dsb/presse/pressemeddelelser/dsbs-new-double-deckers/>)

E401*																
Type of coaches	2nd class Seats	1st class Seats	Driving trailer Seats	2nd class coaches - #	1st class coaches - #	% of usage	Seats (whole formation)	Seats weighted by loco Value	Unitary book value - Coaches	Unitary book value - Driving trailer	Unitary book value - Loco	Formation value	# green loco	# green coaches	# Complete formations	# Coaches left
UIC Z1	66	54	64	5	1	75%	448	150.54	344,418 €	1,196,284 €	1,651,229 €	4,914,018 €	21			

Seats of the average formation	336.0	112.9
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*Assumed that 25% of the loco run during the night and are excluded from the estimation

E414																
Type of coaches	2nd class Seats	1st class Seats	Driving trailer Seats	2nd class coaches - #	1st class coaches - #	% of usage	Seats (whole formation)	Seats weighted by loco Value	Unitary book value - Coaches	Unitary book value - Driving trailer	Unitary book value - Loco	Formation value	# green loco	# green coaches	# Complete formations	# Coaches left
IC - Gran comfort	74	52	59	5	3	33%	585	104.0	222,983 €	1,196,284 €	644,653 €	3,624,804 €	58			
UIC Z1	66	54	64	5	3	66%	556	78.0	344,418 €	1,196,284 €	644,653 €	4,596,277 €	58	176	19	5

Seats of the average formation	560.0	85.8
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E402 B																
Type of coaches	2nd class Seats	1st class Seats	Driving trailer Seats	2nd class coaches - #	1st class coaches - #	% of usage	Seats (whole formation)	Seats weighted by loco Value	Unitary book value - Coaches	Unitary book value - Driving trailer	Unitary book value - Loco	Formation value	# green loco	# green coaches	# Complete formations	# Coaches left
IC - Gran comfort	74	52	59	5	3	35%	585	98.7	222,983 €	1,196,284 €	604,992 €	3,585,143 €	5			
UIC Z1	66	54	64	5	3	40%	556	73.8	344,418 €	1,196,284 €	604,992 €	4,556,616 €	5			

Seats of the average formation	427.2	64.1
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In case of a locomotive pulling/pushing a set of passengers cars (i.e. E464 of FS or Vectron AC DDK of DSB), the number of available seats depends on the frequency of use of the specific formations that are utilized and on the coaches, in terms of type and numbers, which form the relevant formation. On the right we have described the single steps to calculate the available seats, using the Locomotive E464 as example; the other locomotives use the same logic.

- 1) We first define the different coaches and relevant % of usage (E464 utilizes MD coaches 52.6% of the time, PR Coaches 15.8% of the time and Vivalto coaches for 31.6% of the time) and then the formation and relevant seats by type of coach (i.e. the loco E464 carries 3 second class (82 seats available each), 2 first class (72 seats available each) and 1 driving trailer (60 available seats) of the coach type MD)
- 2) We then calculate the financial value of the formation and of the single component (loco, coaches), taking as a basis the updated book value received by the Railway Operator
- 3) As we did not finance always the entire formation, but only the Locomotive, we weighed the available seats as pro rata of the book values (i.e. for the coach MD: $450 * 1.322.854 / 3.306.303 = 180,0$)
- 4) Starting from this data, provided by FS, we can estimate the seats that the average loco-coaches formation carries, weighing the available seats of a formation with the frequency of utilization (i.e. for the locomotives E464: $180,0 * 52,6% + 264,5 * 15,8% + 141,0 * 31,6% = 181,0$)
- 5) In case we financed also the coaches (i.e. Vivalto), we estimated the numbers of complete formations (in this case, 41, as we financed 248 Vivalto coaches and each formation requires 6 coaches) and use the total available seats for the formation (648)
- 6) To avoid a double counting, the savings of the Vivalto coaches are not considered and put to zero, with the exclusion of the 2 coaches left; $248 \text{ (Financed Coaches)} - 6 \text{ (Coaches per formation)} * 41 \text{ (number of complete formation)} = 2 \text{ Coaches left}$. The value of the Seats is in this case 126

LIST OF AVAILABLE SEATS BY ASSET CLASS

Asset class	Available seats	Notes
CLASS 2400 CFL	334	
M6 SNCB	80	
RABE 514	384	
RABE 521	161	
RABE 522	161	
RABE 523	161	
RABE 503	422	
CIVIA 465	277	
E464	181.0	This value does not apply on 41 locomotives, where we have enough coaches to form a complete formation. In this case the value is 648 seats
VIVALTO	-	We put to zero the savings, not to double count them (see above the note on the E464), with the exclusion of the 2 coaches which are left, after completing the 41 formation. In this case the value is 126 seats
E403 FS	218.7	
CLASS 449	263	
CIVIA 463	169	
CIVIA 464	223	
S-104	237	
S-114	237	
ETR 324 JAZZ	202	
ETR 425 JAZZ	290	
MINUETTO E	169	
CLASS 447 RF	234	
RABDE 500	431	
RABE 511/6	535	
RABE 511/4	337	
RABE 520	128	
UIC Z1A	-	We put to zero the savings, not to double count them (see below the note on the E414)
UIC Z1 FS	-	We put to zero the savings, not to double count them (see below the note on the E414), with the exclusion of the 5 coaches which are left, after completing the 19 formation. In this case the value is 66 seats
CLASS 11 SNCB	80	
E401 FS	112.9	
E402 B FS	64.1	This value does not apply on 19 locomotives, where we have enough coaches to form a complete formation. In this case the value is 556 seats
E414	85.8	
VECTRON AC DDK	207.6	
CLASS 6112 HZ	220	
RABE 526-3	106	
RABE 526-4	163	