

Appendix 9: Transportation

Table 1: Vehicle classes, lorry (NTM, -00)

Vehicle classes	Total weight(ton)	Payload (ton)	Approximate length (m)
Parcel delivery vehicle, distribution services	3.5	1.4	5.5
Light lorry, distribution services	3.5-14	1.5-8.5	9
Medium lorry, regional transport	14-24	8.5-14	10
Heavy lorry, with trailer, long-distance transport	40	26	18
Heavy lorry with trailer, long-distance transport	60	40	24

Table 2: Energy requirement for transportation with lorries. Process energy.

Transport mode	Country	Source	Comment	Energy use,	Unit and energy carrier
Delivery van	-	Frischknecht et al. 1994, Anhang B, p. 5	Total weight under 3.5 t, max. load 0.5-1.8 t, workload 50%	0,09	kg fuel per tonne-km
Lorry	Denmark	Weidema, 1995, p. 163	Ref. from 1994. No refrigeration	0,9	MJ diesel per tonne-km
Lorry, long range distribution	Sweden	Tillman, 1994, p. 2	Data for 1994. No refrigeration	0,9	MJ diesel per tonne-km
Lorry, heavy with trailer, long distance transport, 40 tonnes payload	Sweden	NTM, -00	Data for 00, no refrigeration	0,54-0,68	MJ diesel per tonne-km
Lorry, heavy with trailer, long distance transport, 26 tonnes payload	Sweden	NTM, -00	Data for 00, no refrigeration	0,61-0,72	MJ diesel per tonne-km
Lorry, long-range distribution	Sweden	Lorentzon et al, 1997, p. 14	Maximum load 40 tonnes, loading factor 60 %, no refrigeration	0,45	litre diesel per km
Lorry, regional distribution	Sweden	Tillman, 1994, p. 2	Ref. from 1994. No refrigeration	1,7	MJ diesel per tonne-km
Lorry, medium, regional distribution	Sweden	NTM, -00	Data for 00, no refrigeration	1,5-2,0	MJ diesel per tonne-km
Lorry, city distribution	Sweden	Tillman, 1994, p. 2	Ref. from 1994. No refrigeration	2,2	MJ diesel per tonne-km
Lorry, light, distribution	Sweden	NTM, -00	Data for 00, no refrigeration	2,1-2,5	MJ diesel per tonne-km
Lorry, distribution	Sweden	Lorentzon et al, 1997, p. 14	Maximum load 14 tonnes, load factor 40 %, no refrigeration	0,37	litre diesel per km
Lorry, distribution	Sweden	Lorentzon et al, 1997, p. 14	Maximum load 8 tonnes, load factor 40 %, no refrigeration	0,35	litre diesel per km
Lorry	-	Frischknecht et al. 1994, Anhang B, p. 5	Total weight 3.5-16t, workload 50%	0,06	kg fuel per tonne-km
Lorry	-	Frischknecht et al. 1994, Anhang B, p. 5	Total weight 16-28t, workload 50%	0,04	kg fuel per tonne-km
Lorry	-	Frischknecht et al. 1994, Anhang B, p. 5	Total weight 40t, workload 50%	0,03	kg fuel per tonne-km
Refrigeration equipment, long-range distribution	Sweden	Lorentzon et al, 1997, p. 15	Average speed 70 km/hour	1,25	litre diesel per hour

Table 2: Energy requirement for transportation with lorries, continued....

Refrigeration equipment, distribution	Sweden	Lorentzon et al, 1997, p. 15	Average speed 30 km/hour	2,22 litre diesel per hour
Refrigeration equipment, lorry	Sweden	Carlsson-Kanyama, 1997, p. 24, appendix	data from 1996	1,5 litre diesel per hour
Refrigeration equipment, trailer	Sweden	Carlsson-Kanyama, 1997, p. 24, appendix	data from 1996	2,5 litre diesel per hour

Table 3: Energy requirement for transportation with trains. Process energy.

Transport mode	Country	Source	Comment	Energy use, MJ	Unit and energy carrier
Train	Denmark	Weidema, 1995, p. 163	Ref. from 1994	0,8	diesel per tonne-km
Train	Denmark	Weidema, 1995, p. 163	Ref. from 1994	0,6	electricity per tonne-km
Train	Sweden	Tillman, 1994, p. 3	Data for 1994. 10 wagons, 40 % load	0,4	electricity per tonne-km
Train	Sweden	Tillman, 1994, p. 3	Data for 1994. 10 wagons, 80 % load	0,29	electricity per tonne-km
Train	Sweden	Tillman, 1994, p. 3	Data for 1994. 52 wagons, 40 % load	0,29	electricity per tonne-km
Train	Sweden	Tillman, 1994, p. 3	Data for 1994. 52 wagons, 80 % load	0,22	electricity per tonne-km
Wagonload train	Sweden	NTM, -00	Data for-00	0,072-0,27	electricity per tonne-km
Circuit-working train	Sweden	NTM, -00	Data for-00	0,097-0,26	electricity per tonne-km
Combined train	Sweden	NTM, -00	Data for-00	0,13-0,26	electricity per tonne-km
Diesel train	Sweden	NTM, -00	Data for-00	0,23	diesel per tonne-km
Train	-	Frischknecht et al. 1994, Anhang B, p. 30	Assumed average	0,14	electricity per tonne-km

Table 4: Energy requirement for transportation with ships etc. Process energy.

Transport mode	Country	Source	Comment	Energy use, MJ	Unit and energy carrier
Ship, coastal	Denmark	Weidema, 1995, p. 163	Ref. from 1994. No refrigeration	0,5	fuel oil per tonne-km
Ship, overseas	Denmark	Weidema, 1995, p. 163	Ref. from 1994. No refrigeration	0,2	fuel oil per tonne-km
Ships, ocean going	Sweden	Tillman, 1994, p. 4	Ref. from 1994. No refrigeration	0,18	fuel oil per tonne-km
Ships, tankers	Sweden	Tillman, 1994, p. 4	Ref. from 1994. No refrigeration	0,11	fuel oil per tonne-km
Ships, coastal	Sweden	Tillman, 1994, p. 4	Ref. from 1994. No refrigeration	0,47	fuel oil per tonne-km
Cargo vessel, large	Sweden	NTM, -00	> 8000 dwt, No refrigeration	0,050-0,30	fuel oil per tonne-km
Cargo vessel, medium isze	Sweden	NTM, -00	>2000- 8000 dwt, No refrigeration	0,14-0,40	fuel oil per tonne-km
Cargo vessel, small	Sweden	NTM, -00	<2000 dwt, No refrigeration	0,16-0,68	fuel oil per tonne-km
RoRo vessels	Sweden	NTM, -00	No refrigeration	0,16-0,68	fuel oil per tonne-km
Ferries	Sweden	NTM, -00	ferries from Sweden to Denmark, Finland, No refrigeration	0,068-0,79	fuel oil per tonne-km
Ship, bulk carrier cargo	-	VIA 1990 in Frischknecht et al. 1994, Anhang B, p. 54	-	0,9-1,8	fuel oil per tonne-km