Environmental Report
2012

We work to create connections. Between A and B. Town and country.
Granny and Victor. Income and expenditure. Promise and delivery.

DSB

Content

Environment and climate

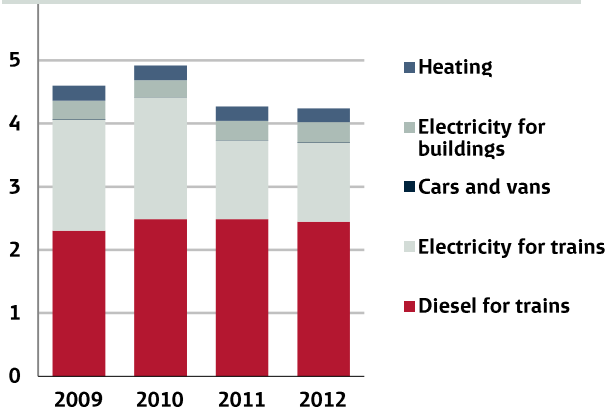
DSB is a rail operator, and by definition, the train is a relatively environmentally friendly mode of transport. If DSB want to protect the environmental advantages of the train, DSB has to consider the energy consumption and effect on the climate. DSB is also aware that trains constitute an inconvenience to neighbours of the railway in the form of noise and smoke.

In the short term, DSB is aiming for a reduction in energy consumption, and in the longer term, DSB is committed to getting the trains to operate on renewable energy.

In 2012, DSB's total energy consumption for trains fell by about 4 percent compared to 2011. One reason is the increased punctuality of DSB trains which makes for a smooth ride; another reason is the collision accident involving the Limfjord Bridge which meant that there was no train service between Aalborg and Frederikshavn for a prolonged period.

Fig. 1: Direct and indirect energy consumption

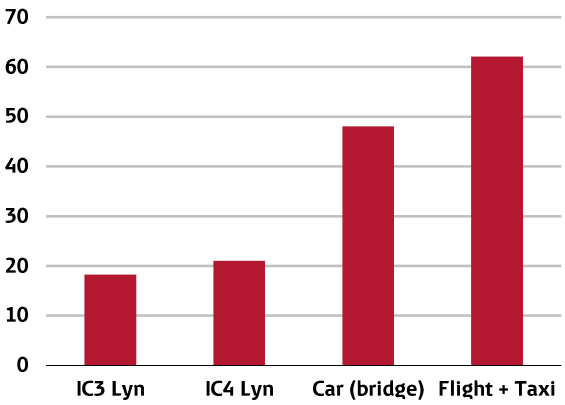
GJ (million)



DSB's total CO_2 emissions rose by about 10 percent in 2012 compared to 2011. The main reason is that in 2012, DSB did not purchase RECS certificates for the electricity consumption in its buildings, which is why it is included in the 2012 calculation of CO_2 emissions.

Fig. 2: CO_2 emissions (Aalborg–Copenhagen)

Kg per person



In 2012, the energy consumption of diesel trains per seat kilometre fell compared to 2011, while the same figure for electric trains remained at the 2011 level.

The reason for the fall in energy consumption and CO2 emissions for diesel trains is partly the high punctuality rates and partly the effect of the GreenSpeed project.

DSB's electric trains are now more often used as regional trains whereas previously they were used for long-distance services. As there are typically fewer passengers on a regional service compared to a long-distance service, the relative energy consumption per passenger kilometre in electric trains has risen.

Fig. 3: Electricity and diesel consumption per passenger kilometre

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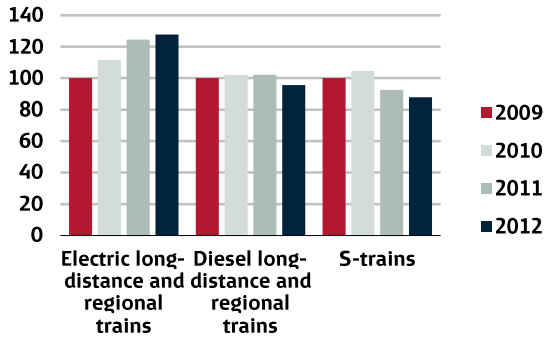


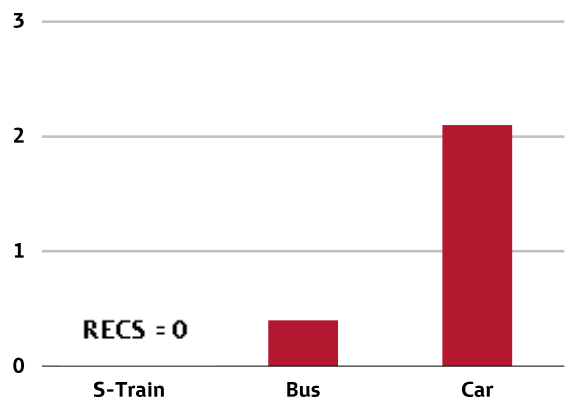
Table 1: Development in energy consumption and CO_2 emissions

	Energy consumption per seat kilometre	Energy consumption per passenger kilometre	CO_2 emissions per passenger kilometre
Long-distance and regional trains			
- Diesel trains	-4%	-4%	-4%
- Electric trains	0%	3%	0%
S-Trains	2%	-3%	0%

In 2012, S-Trains used 2 percent more energy per seat kilometre compared to 2011. Part of the reason was the cold winter with 7 percent more degree days in the Copenhagen area compared to the figure for 2011. On cold days, S-Trains use more energy, as the heating of the train constitutes a significant proportion of the energy consumption.

Fig. 4: CO_2 emissions for a 12-km trip in the Copenhagen area

Ton (1,000)



Buildings and workshops

DSB also strives to make savings in its buildings. Areas of focus include:

- replacement of circulation pumps for "energy saving pumps";
- new escalators with frequency control and LED lighting;
- replacement of fairly old gas boilers;
- installation of new windows with lower heat loss;
- energy saving control of ventilation systems (frequency converters).

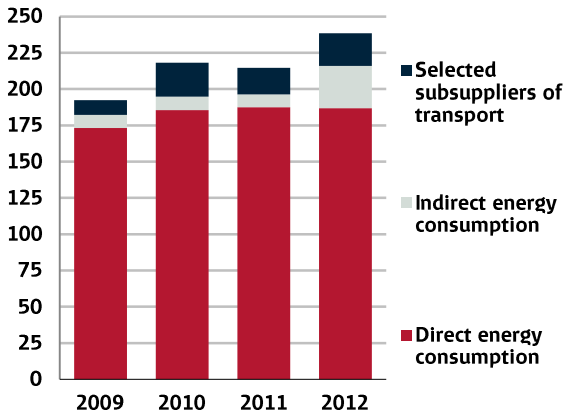
New software for S-Trains

In order to save energy on traction current, DSB has developed new software for S-Trains which requires less energy for ventilation and ensures a reduced loss of energy in catenary wires and lighting. None of the changes will be noticed by passengers.

The new software is expected to produce an annual saving of about 3.7 GWh. This corresponds to about 3 percent of the total energy consumption of traction current for S-Trains.

Fig. 5: CO_2 emissions distributed on source

Ton (1.000)



The CO_2 emissions from selected subsuppliers of transport rose by 24 percent. The reason is that there was a great deal of track improvement work in 2012 compared to 2011 and thereby also many more replacement bus services. In addition, the collision accident involving the Limfjord Bridge meant that passengers for the Aalborg–Frederikshavn service travelled in buses rather than by train for quite some time. Moreover, the travel pattern for school trips was different in 2012 compared to 2011, as the total number of school pupils going on residential school trips fell and fewer schools chose a destination involving ferry travel which typically has higher CO_2 emissions than the alternatives selected.

GreenSpeed

For some years, DSB has been working on a GPS-based application called GreenSpeed, which makes it possible to drive the trains so they use the least amount of energy while still adhering to the timetable. The system was installed in IC3 trains, IR4 trains, Øresund trains, Desiro trains and ME locomotives in 2011 and put into operation at the beginning of 2012.

Preliminary experience with the system shows that it has contributed to an improvement of punctuality by reducing the number of minor delays of 1–2 minutes. GreenSpeed has also had a positive effect on the energy consumption, a reduction of about 3 percent.

Reducing local impact

Trains constitute an inconvenience to neighbours of the railway in the form of noise and smoke.

The emission of particles from diesel trains rose by 6 percent compared to 2011. The reason is a rise in operation and that MR trains emit more particles than IC3 trains and IC4 trains.

Fig. 6: Particle emission

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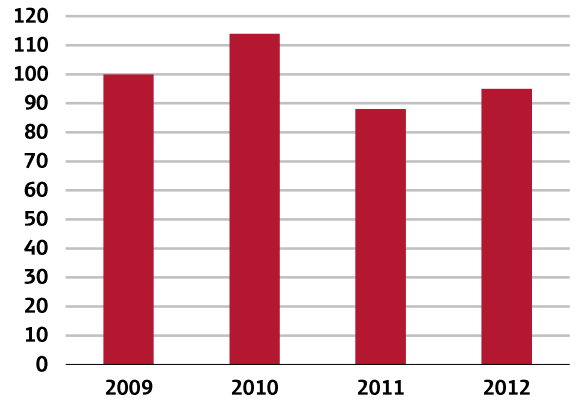

The number of noise complaints forwarded to DSB in 2012 is on the same level as the year before. In 2012, DSB received 33 complaints against 36 in 2011.

Several of the complaints about S-Trains concern loudspeaker noise from the stations. It is necessary to inform passengers, but DSB regularly checks the sound level to avoid any unnecessary inconvenience.

The majority of the complaints relating to long-distance and regional trains concern trains in idle running near a built-up area. DSB follows up on such complaints on an ongoing basis and checks that internal rules are observed.

The number of complaints about smoke is also on a level with last year, as DSB received eight complaints in 2012 against six in 2011. The smoke comes from the old diesel rolling stock.

During 2011, DSB fitted six MR train sets with catalytic converters, which cut the emission of HC and particles and reduced the opacity, and this means less black smoke. DSB also fitted emission kits on 20 ME locomotives in 2010. An emission kit reduces a locomotive's emission of nitrogen and carbon. It provides a 34 percent reduction of the emission of NO_x and the emission of particles drops by 37 percent.

Towards the end of 2012, DSB decided to fit emission kits on a further 13 ME locomotives. This was partly because it had been decided to use ME locomotives to pull the double-decker coaches.

The fitting is expected to be complete before the end of 2013.

Accounting policies

Annual statement
The annual statement includes data for DSB's activities as well as data for plants and buildings where DSB activities take place.

All affiliated companies in Denmark (fully owned and DSB Øresund) are included in the calculations of DSB's energy consumption for and emissions from train operation, fixed plants and the mileage made by company cars and vans.

The statements on selected chemical products and on the disposal of waste include information from DSB and all affiliated companies in Denmark (fully owned exclusive DSB Øresund).

External suppliers
As a main rule, the consumption and emissions undertaken by external suppliers on contracts with DSB are not included. An exception is the consumption of selected chemical products and the CO_2 emissions from selected suppliers of transport. This applies to replacement journeys by bus and taxi, school trips undertaken by bus and ferry, employee transport by aeroplane, taxi and car as well as employees' car mileage to and from work. Official journeys by train outside Denmark are not included.

DSB as supplier
Consumption and emissions from buildings that are owned by DSB but are rented out are not included.

Compiling and processing data
All data in the annual statement is compiled via DSB's registration systems. Procedures for the compiling of data and quality control are described in "the manual for compiling environmental data". The manual describes the distribution of roles and responsibilities between central and decentralised environmental employees during the preparation of DSB's environmental report. The process starts with the compiling and assessing of environmental data in the units, and then the units' contributions to data and text are processed and gathered into one entity for DSB. The quality control of the data is undertaken both in the units and centrally in DSB.

The independent auditor has made random checks of the processing of the reported data and checked mass balances for sulphur and carbon.

Energy consumption for train operation
The consumption of diesel is registered automatically when topped up. Add to this the wastage from stationary tank installations which are also included in the calculation. DSB pays for the traction current based on invoices received from Banedanmark. The electricity consumption is distributed on the trains according to the meter readings on the trains. A loss of traction current is added to the recorded values.

Energy consumption for non-revenue kilometres for long-distance trains is accounted separately for DSB without the affiliated companies' production of non-revenue kilometres and is not distributed on the products.

Air emissions
DSB's statement on air emissions is compiled on the basis of key figures.

As of 2008 DSB has used power produced via renewable energy sources for train operations. In 2012, DSB did not purchase RECS certificates for the elektricity consumption in buildings. This means that the emission ratios from electrical train oprerations are not found in the calculation as well as for electricity in buildings for the period 2009-2011. DSB receives documentation stating that the current is produced by renewable energy sources in the form of a RECS certificate from Vindenergi Danmark.

The key figures for the emissions from the diesel consumption are based on readings of the emissions' dependency on engine performance as well as readings or simulation of engine performance at different driving patterns. Emissions from non-revenue kilometres and shunting rolling stock are not included in the emissions statement, as DSB does not have any exact knowledge about the emissions, and it would be an insignificant part of the total emissons. However CO_2 and SO_2 emissions from non-revenue kilometres are included in the emissions statement.

Key figures for emissions from cars and vans are collected from TEMA2010. The emission levels of SO2 are corrected according to the sulphur contents of petrol and diesel, respectively.

Key figures for CO_2, SO_2 and NO_x from buildings with district heating are calculated on the basis of the statement from Energinet.dk for emissions and thermal production in Denmark. A mean value is used for 2010 and 2011. The thermal production covers 76 per cent of the overall Danish district heating production. The key figure has been calculated on the basis of the energy content method and is corrected for a 20 per cent net loss in the distribution network.

Key figures for CO_2, SO_2 and NO_x from buildings are for gas and fuel oil from 2011 based on data from DCE (Danish Centre For Environment And Energy). Data may be found on the website under the subject of "Air", Emission Statements, Emissions Factors for LPG, Natural gas and Gas oil in the category "residential plants". In the calculation of the emissions from the energy consumption in buildings, the electricity key figure for traction current is corrected for a 5 per cent net loss in the distribution network.

Indexation
In the annual statement, the consumption and emissions for 2012 are calculated in absolute quantities. 2009 is the base year for indexation. In some cases, it has been decided not to index the consumption and emissions on account of, for instance, different maintenance intervals between the years. This applies, for instance, to a few chemical products.

Environmental disclosures and comparisons with other forms of transport
For the environmental disclosure for train products and comparisons between different forms of transport, we use for the train the annual energy consumption and emissions as well as the annual average occupancy rate.

Key figures for cars have been taken from the Ministry of Transport model, the TEMA2010. There may be major variation in the result, depending on the type of car that you drive. DSB has decided on an average between a fairly small and a fairly large car, both with EURO III engines. This key figure is close to the average for the Danish fleet of cars.

To calculate the CO_2 emissions from aeroplanes, we use Scandinavian Airlines' CO_2 calculator. We use the default value for the most commonly used planes on the selected route.

The occupancy rates for cars come from the statistics of the Danish Road Directorate. We estimate that there is an average of 1.54 passengers in the car, and for calculations during rush hours, we estimate that there is an average of 1.1 passengers.

For environmental disclosures for types of rolling stock, we use the annual energy consumption and emissions as well as the number of seat kilometres covered by the rolling stock. The distribution on the different types of rolling stock is performed using the annual statement tool.

External declaration
In 2008, RISØ updated the professional assessment of the method of the annual calculation of the energy consumption and emissions of train travel which DSB uses as a declaration. The original declaration is from 2001 and it still applies, as the method and prerequisites remain unchanged in relation to the date of the declaration.

Environmental key figures

Environmental disclosure and statements for 2012

The environmental disclosures include energy consumption an emissions of various types of air pollutants for product types and types of rolling stock.

The annual statements contains absolute figure of consumption and emissions for 2012 as well as index figures for the period 2009-2012.

Environmental disclosure for train products 2012

Train product	Energy consumption	CO_2
Per passenger kilometre	**MJ**	**g**
S-trains	0,38	0
Regional trains	1,01	66
InterCity trains	0,45	28
Extress trains	0,45	33

The environmental disclosure for the train product shows the energy consumption and CO_2 emission per passenger kilometre from DSB's products in 2012.

Environmental disclosure for types of rolling stock 2012

Train type	Energy consumption	CO_2	CO	NO_x	SO_2	HC	Dust	Particles
Per seat kilometre	MJ	g	mg	mg	mg	mg	mg	mg
S-trains (electricity)	0,088	0	0	0	0	0	0	0
Desiro (diesel)	0,291	21,510	96,891	169,559	0,136	26,645	0	3,633
ME and double-decker coaches (diesel)	0,316	24,217	47,734	369,152	0,148	18,984	0	11,676
Øresund trains (electricity)	0,144	0	0	0	0	0	0	0
MR (diesel)	0,287	20,555	92,481	321,065	0,134	50,686	0	19,096
IR4 (electricity)	0,139	0	0	0	0	0	0	0
IC3 (diesel)	0,287	21,230	13,523	121,848	0,134	6,423	0	0,961
IC4 (diesel)	0,427	31,576	22,684	178,300	0,200	10,658	0	1,551

The environmental disclosure for train types shows the energy consumption and emissions per seat kilometre from DSB's train types in 2012.

Annual statement for 2012

Consumption

	Note	Index 2009	Index 2010	Index 2011	Index 2012	Volume 2012	Unit
Energy consumption							
Trains, total							
Electricity		100	103	104	103	254.286	MWh
Diesel		100	107	108	106	68.072.844	litre
The corporation, total		**100**	**96**	**100**	**100**	**126.106**	**MWh**
Electricity		100	94	104	110	65.862	MWh
Heating (adjusted for degree days)		100	98	97	92	60.244	MWh
Direct energy consumption							
The train product (L&R) (diesel)		**100**	**102**	**108**	**106**	**68.072.844**	**litre**
Train operation		100	107	107	105	65.369.110	litre
Shunting	1	-	-	-	-	46.479	litre
Non-revenue kilometres	2	100	119	158	172	2.657.255	litre
The corporation							
Cars and vans							
Petrol	3	100	51	26	113	272.556	litre
Diesel	3	100	49	38	32	21.513	litre
Heating (adjusted for degree days)	4	100	85	102	90	12.385	MWh
Heating oil		100	92	75	71	480	MWh
Gas		100	84	103	91	11.905	MWh
Indirect energy consumption							
The train product (electricity)		**100**	**103**	**104**	**103**	**254.286**	**MWh**
S-trains		100	107	102	104	127.295	MWh
The Coastal Line (operatet by DSB Øresund)		100	108	119	119	65.302	MWh
Long-distance og regional trains		100	93	96	91	60.685	MWh
Non-revenue kilometres (L&R)	2	100	105	68	58	1.004	MWh
The corporation		**100**	**97**	**100**	**102**	**113.721**	**MWh**
Electricity	4	100	94	104	110	65.862	MWh
District heating incl. steam (adjusted for degree days)	4	100	101	96	92	47.859	MWh
Water consumption							
Water consumption	4	100	99	105	87	186.319	m^3
Chemical products (selected)							
Nitrogen content in slippery surface prevention agents	5	-	-	-	-	18,1	tonne
Herbicides	6	-	-	-	-	170	kg active sub.

Base year for indexation is 2009 = 100.

Emissions

	Note	Index 2009	Index 2010	Index 2011	Index 2012	Volume 2012	Unit
Air emissions, calculated	7						
CO_2			**100**	**98**	**108**	**236.465**	**tonne**
Product			100	98	98	196.250	tonne
The corporation			100	99	209	40.215	tonne
Direct energy consumption (GHG* scope 1)		**100**	**106**	**107**	**106**	**184.805**	**tonne**
Product	**8**	**100**	**107**	**108**	**106**	**181.463**	**tonne**
Long-distance and regional trains (diesel)		100	107	108	106	181.463	tonne
The corporation		**100**	**77**	**86**	**91**	**3.342**	**tonne**
Cars and vans (petrol and diesel)	3	100	51	28	97	771	tonne
Heating (heating oil and gas)		100	85	101	90	2.571	tonne
Indirect energy consumption (GHG* scope 2)		**100**	**102**	**98**	**322**	**29.047**	**tonne**
Product	**8**	**100**	**100**	**100**	**100**	**0,0**	**tonne**
S-trains (electricity)		100	100	100	100	0,0	tonne
The Coastal Line (electricity)		100	100	100	100	0,0	tonne
Long-distance and regional trains (electricity)		100	100	100	100	0,0	tonne
The corporate		**100**	**102**	**98**	**322**	**29.047**	**tonne**
Electricity consumption for fixed systems	9	-	-	-	-	20.711	tonne
District heating inkl. steam		100	102	98	93	8.335	tonne
Selected transport sub-suppliers (GHG* scope 3)			**100**	**78**	**96**	**22.613**	**tonne**
Product			**100**	**68**	**91**	**14.787**	**tonne**
Replacement busses		100	199	58	218	6.404	tonne
S-trains		100	1084	36	28	78	tonne
Long-distance and regional trains		100	106	61	238	6.326	tonne
Taxa		100	132	103	71	9,3	tonne
School journeys			100	91	80	8.373	tonne
Busses			100	138	91	295	tonne
Ferries			100	89	80	8.078	tonne
The corporation		**100**	**97**	**96**	**106**	**7.826**	**tonne**
Service travel by airplane	10	100	207	203	563	1.087	tonne
Service travel in own car		100	100	172	137	65	tonne
Taxa		100	107	103	78	101	tonne
Employee transport to and from work		100	94	92	94	6.574	tonne

Base year for indexation is 2009 = 100.
An exception is CO_2 from School journeys, where base year for idexation is 2010.
* GHG = Green House Gas protocol

Emissions

	Note	Index 2009	Index 2010	Index 2011	Index 2012	Volume 2012	Unit
Air emissions, calculated	7						
NOx						**1.792**	**tonne**
Product	**8**	**100**	**110**	**95**	**95**	**1.765**	**tonne**
Long-distance and regional trains (electricity og diesel)		100	110	95	95	1.765	tonne
The Coastal Line (electricity)		100	100	100	100	0,0	tonne
S-trains (electricity)		100	100	100	100	0,0	tonne
The corporate		**100**	**83**	**68**	**146**	**27**	**tonne**
Cars and vans (petrol og diesel)	3	100	83	39	178	2,19	tonne
Heating (district heating, heating oil og gas)		100	83	70	65	11,3	tonne
Electricity consumption for fixed systems	9	-	-	-	-	13,9	tonne
SO_2						**6,61**	**tonne**
Product	8	**100**	**107**	**108**	**106**	**1,14**	**tonne**
Long-distance and regional trains (electricity og diesel)		100	107	108	106	1,14	tonne
The Coastal Line (electricity)		100	100	100	100	0,0	tonne
S-trains (electricity)		100	100	100	100	0,0	tonne
The corporate		**100**	**90**	**60**	**109**	**5,47**	**tonne**
Cars and vans (petrol og diesel)	3	100	239	135	5	0,0002	tonne
Heating (district heating, heating oil og gas)		100	90	60	48	2,40	tonne
Electricity consumption for fixed systems	9	-	-	-	-	3,06	tonne
HC						**137**	**tonne**
Product	**8**	**100**	**111**	**99**	**106**	**137**	**tonne**
Long-distance and regional trains (electricity og diesel)		100	111	99	106	137	tonne
The Coastal Line (electricity)		100	100	100	100	0,0	tonne
S-trains (electricity)		100	100	100	100	0,0	tonne
The corporate		**100**	**15**	**9**	**26**	**0,10**	**tonne**
Cars and vans (petrol og diesel)	3	100	15	9	26	0,10	tonne
CO						**296**	**tonne**
Product	**8**	**100**	**109**	**87**	**92**	**295**	**tonne**
Long-distance and regional trains (electricity og diesel)		100	109	87	92	295	tonne
The Coastal Line (electricity)		100	100	100	100	0,0	tonne
S-trains (electricity)		100	100	100	100	0,0	tonne
The corporate		**100**	**16**	**11**	**27**	**1,05**	**tonne**
Cars and vans (petrol og diesel)	3	100	16	11	27	1,05	tonne
Particles (TSP)						**57**	**tonne**
Product	**8**	**100**	**114**	**88**	**95**	**57**	**tonne**
Long-distance and regional trains (diesel)		100	114	88	95	57	tonne
The corporate		**100**	**38**	**14**	**58**	**0,09**	**tonne**
Cars and vans (petrol og diesel)	3	100	38	14	58	0,09	tonne
Dust						**0,0**	**tonne**
Product	**8**	**100**	**100**	**100**	**100**	**0,0**	**tonne**
Long-distance and regional trains (electricity)		100	100	100	100	0,0	tonne
The Coastal Line (electricity)		100	100	100	100	0,0	tonne
S-trains (electricity)		100	100	100	100	0,0	tonne
Ozone-depleting agents						**1,78**	**tonne**
HFC	11	100	155	221	256	1,63	tonne
HCFC	12	100	119	361	535	0,15	tonne

Base year for indexation is 2009 = 100.

Emissions

	Note	Index 2009	Index 2010	Index 2011	Index 2012	Volume 2012	Unit
Waste						7.350	tonne
Waste (excl. building waste)		**100**	**92**	**98**	**95**	**7.021**	**tonne**
For recycling		100	81	97	97	2.277	**tonne**
For incineration		100	98	102	100	4.156	tonne
for special treatment		100	90	79	64	527	tonne
For depositing		100	54	106	105	61	tonne
Building waste		**-**	**-**	**-**	**-**	**328**	**tonne**
For recycling		-	-	-	-	240	tonne
For incineration		-	-	-	-	6,5	tonne
for special treatment		-	-	-	-	21	tonne
For depositing		-	-	-	-	61	**tonne**

Base year for indexation is 2009 = 100.

Notes for the annual statement

Notes

1	**Shunting**
	DSB does not calculate emissions from shunting.
2	**Non-revenue kilometres**
	The non-revenue kilometres of the affiliated companies is not included in the statement of non-revenue kilometres. Neither the share of trains operatet by DSB Øresund from 2009.
3	**Cars and vans**
	The fuel consumption for cars and vans rose markedly in 2012. The reason is an error in the registrated consumption of petrol and diesel for 2010 and 2011. The energy consumption for cars and vans leased by DSB is not included in the annual statements for 2010 and 2011. The consumption in 2012 is on level with 2009.
4	**Energy og water consumption for fixed systems**
	DSB improves the data basis for calculations on an ongoing basis. The reason for the large fall in the water consumption was af break in a water pipe in 2011.
5	**Nitrogen content in slippery surface prevention agents**
	The calculated figure is a combination of purchases and consumed volumes. The consumption of slippery surface prevention agents has dropped. The reason is primarily different methods of calculation (calender year instead of October to May) for many of DSB's departments.
6	**Substance for weed control**
	The consumption of active substance for weed control increased in 2012, primarily due to the fact that DSB focussed on weeing along depot tracks and that DSB started to use af new product which have a higher content of active substances.
7	**Air emissions, calculated**
	As of 2008 DSB has used power produced via renewable energy sources for train operations. This means that there are no emissions in this regard in the report.
8	**Product**
	The statement on air emissions is compiled on the basis of key figures. For furhter information look at the part "Accounting policies".
9	**RECS certificates**
	In 2012 DSB has compiled CO_2, NO_x and SO_2 emissions for the electricity consumption in its buildings again. The reason is that for 2012, DSB did not purchase RECS certificates for the electricity consumption in buildings.
10	**Service travel by airplane**
	In 2012 service travel by airplane has increased by 177 per cent. The reason of the increase is fluctuations of travelling by airplane in the first six months of 2012.
11	**HFC**
	Since 2005 the acquisition of new systems with HFC and the use of HFC have been prohibited, except for the purpose of servicing existing systems. Another exception is for air conditioning systems in vehicles, meaning that DSB still uses HFC. Ownership of the workshop at Helgoland has passes to DSB Vedligehold A/S and the activities in this company are included in the annual statement for 2012. In 2012 there is an increase in the use of HFC. The reason is several large inspections and new tasks including maintenance of IC4 trains.
12	**HCFC**
	According to legislation HCFC is required to be phased out by 1 January 2002, but it is legal to fill tanks with reclaimed (recycled) HCFC. Ownership of the workshop at Helgoland has passes to DSB Vedligehold A/S and the activities in this company are included in the annual statement for 2012. In 2012 there was an increase in HCFC due to the renovation of several systems in the IR4 trains.

Declarations

Independent auditors' declaration

To DSB's stakeholders
We have made an assessment of environmental data for 2012 in **DSB Environmental report 2012**.

DSB's Management is responsible for the data in DSB Environmental report 2012. Our responsibility is to express an opinion on the data in the mentioned environmental report.

Basis of opinion
We conducted our work in accordance with International Standards on Auditing on other assurance engagements and additional requirements in accordance with Danish audit regulation to obtain limited assurance for our opinion.

Our work has, based on an assessment of environmental materiality and risk, included analyses, inquiries to the Management of the department for environment and control of whether data has been compiled, assessed, and quality controlled as provided in DSB's manual regarding compiling of environmental data. We have, on a test basis, reconciled the calculation of energy consumption with reporting from data suppliers. Also, we have assessed whether the accounting policies chosen by Management are appropriate and whether the estimates made by Management are reasonable.

An examination is limited primarily to inquiries of company personnel and analytical procedures applied to environmental data and thus provides less assurance than an audit.

We have used both audit and environmental specialists in performing our work. We believe that our work provides a reasonable basis for our opinion.

Opinion
Based on our work, nothing has come to our attention that causes us to believe that the environmental data for 2012 in **DSB Environmental Report 2012** has not, in all material respects, been prepared in accordance with the accounting policies described.

Copenhagen, March 22 2013
KPMG
Statsautoriseret Revisionspartnerselskab

Torben Bender
State Autorised
Public Accontant

Michael N. C. Nielsen
State Autorised
Public Accontant

External assessment of methodology for the annual statement of the energy consumption and emissions of train operations (update of assessment from 2001)

In the assessment of the methodological basis for the Annual Statement Tool I made in 2001, there was one minor reservation in that the data basis for the energy and emission factors for electric trains - freight trains, passenger trains and Strains - was relatively poor. At that time, this was far more aggregated than for diesel trains as it was only divided into S-trains and long-distance trains of which the latter was not broken down into freight and passenger trains, let alone into different types of passenger trains.

These reservations have now been eliminated. First, freight trains are no longer included in the green accounts of DSB. Second, the data basis for electric long-distance trains is far better today and allows for an easy description of the main types of electric long-distance trains (train sets, engine powered). Third, S-trains are now a much more homogenous group in that the latest S-train generation is now dominant. As a result, the fact that only overall measurements of electricity consumption for S-trains exist is of far less significance today than it was before.

Overall this means that the data quality for electric trains is now at a level that allows it to be used without reservation for the green accounts.

February 2008

Kaj Jørgensen, research fellow
Department of Systems Analysis,
Risø DTU

Assessment of the methodological basis for the annual statement tool (2001)

In 2001 DSB asked Kaj Jørgensen from the Department of Systems Analysis at the Research Centre in Risø to make a professional assessment of DSB's method for data handling of the energy consumption and calculation of emissions for the individual train types in connection with the annual statement. The following is the general conclusion of the assessment: "The purpose of this assessment is to provide a professional assessment of the methodology - the so-called "Annual Statement Tool" - used by DSB to state energy consumption and emissions from train operations in Denmark. The method is used for the preparation of DSB's green accounts. (Environmental report)

Overall conclusion
It is estimated that the methodological basis for the Annual Statement Tool is entirely appropriate and that its application for the current purposes is acceptable from a technical perspective. The uncertainties that necessarily exist are at an acceptable level. The greatest uncertainty is associated with an unavoidable principle factor, i.e. the calculation convention for determining the environmental impact from electricity consumption. The calculation principles chosen can be defended, although they are not, and never can be, beyond discussion.

Generally, the values used are reasonable in comparison with the values used by others and results for similar statements, pursuant i.a. to Schipper et al.: "Energy Use in Denmark: An International Perspective", Lawrence Berkeley Laboratory, Berkeley, California, 1992; OECD: "The Environmental Effects of Freight", Paris, 1997; IEA & Lawrence Berkeley National Laboratory: Data for IEA/LBNL undersøgelse af transportenergiforbrug, 1998; Ilgmann: "Gewinner und Verlierer einer CO2-Steuer im Güter- und Personenverkehr", Ludwig Bölkow Stiftung, Ottobrunn, 1998; Ekman: "Transportsektorens energiforbrug og emissioner.

Dokumentationsnotat", memorandum no. 76, The Danish Road Directorate, Copenhagen, 2000.

This applies to the assumptions employed and to the results as well as to specific figures (for example, unit consumption and emissions per unit of traffic) and to the overall results. Finally, it applies to both the underlying documentation and - as far as can be judged - to the application in the model tool. The fact that the data basis for the energy and emission factors of electric trains - freight trains, passenger trains and S-trains – is relatively poor is a weakness. This shortcoming, however, does not prevent the preparation of the environmental assessments which, for example, are included in the green accounts. Nevertheless, it would definitely be an improvement to have more disaggregated material."

Kaj Jørgensen
Department of Systems Analysis,
Risø National Laboratory, 2001