

Benchmark – Danish railway sector

Final Results

DSB

Copenhagen, January 2009

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Agenda

- **Introduction**
- **Methodology**
- **Results**

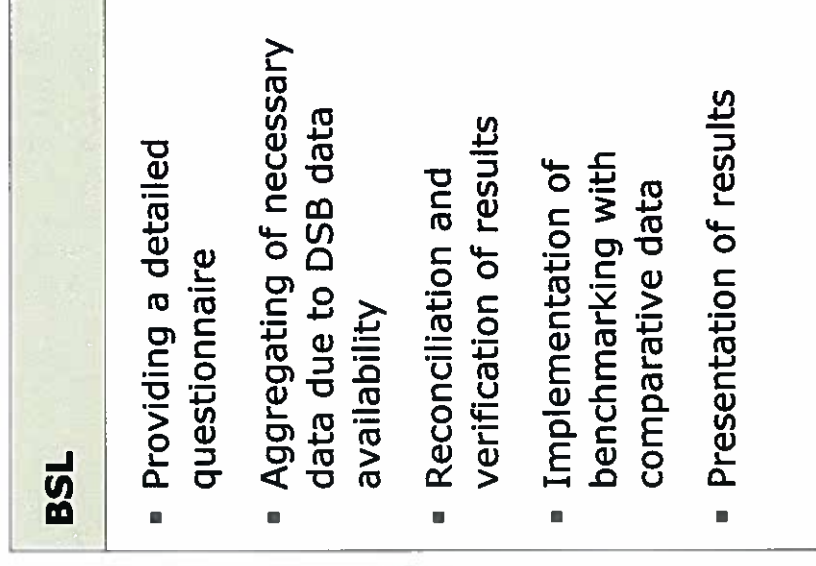
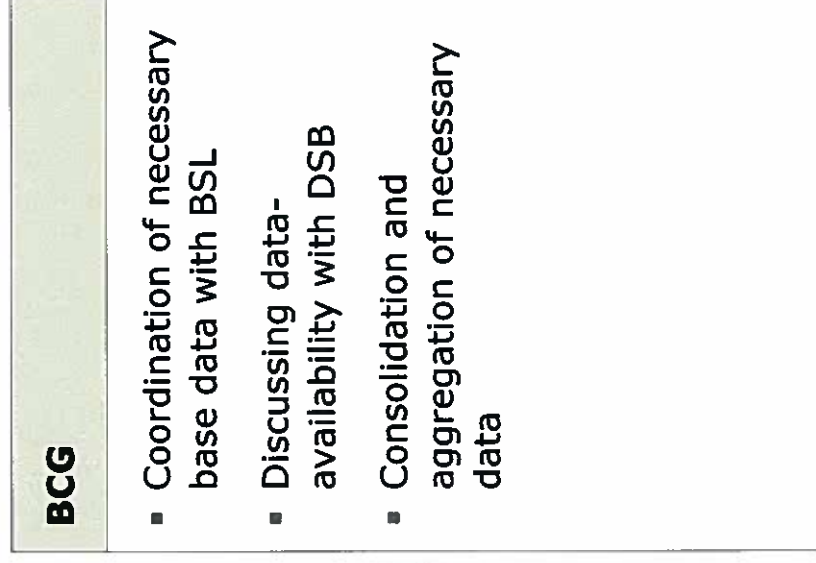
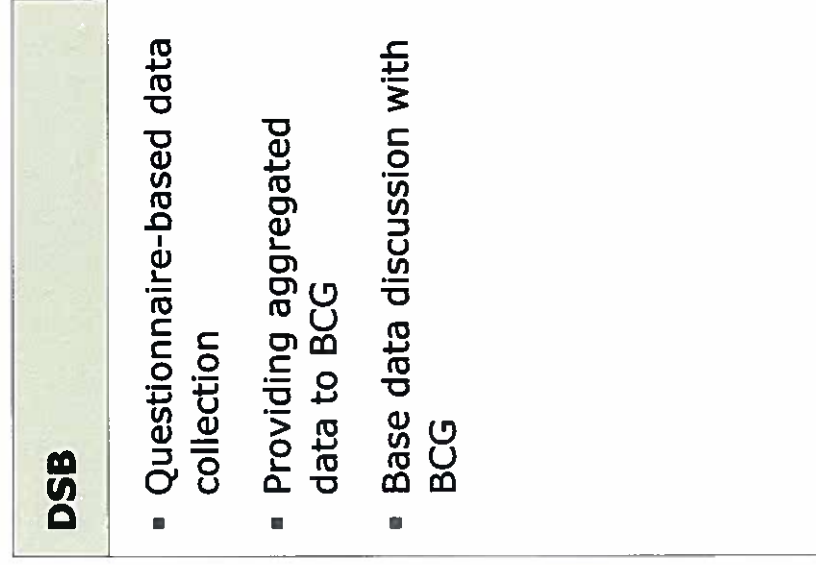
BSL is assigned from BCG to benchmark DSB's cost and productivity to other train operating companies

Background and objectives

- The basis of the benchmarking is the BCG analysis of the Danish railway sector
- BCG assigned BSL for benchmarking the DSB regarding the transport services
 - Intercity trains
 - Regional trains
 - S-tog
- There are two main benchmark targets:
 - Analysis of DSB's cost and productivity for the three transport services
 - Valid and significant comparison to other train operating companies, particularly regarding the liberated markets

The analysis of DSB data is based on an aggregated data collection of DSB together with BCG

Benchmarking procedure



Most European state-owned rail transportation companies are not yet competitive

Market background

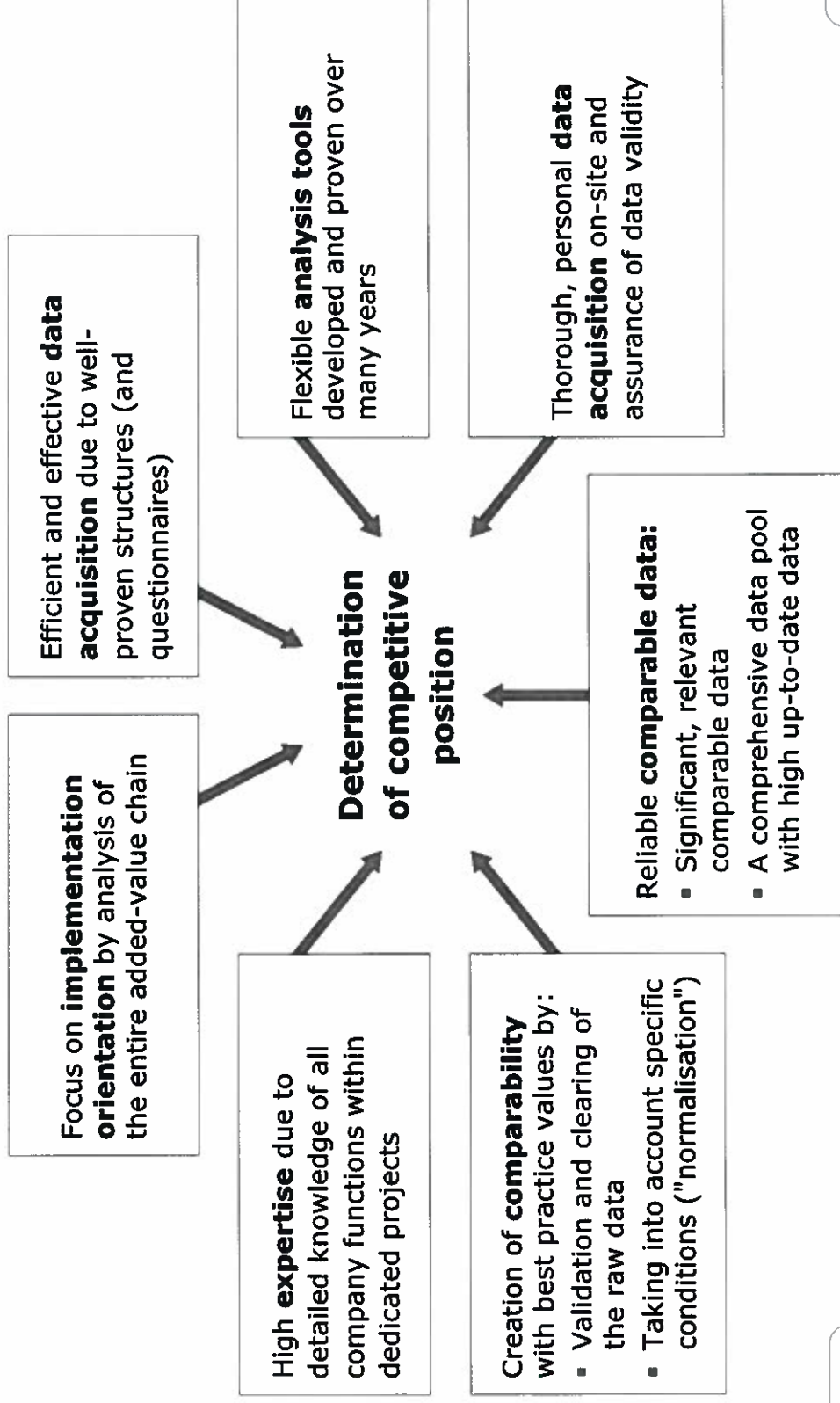
- Competition more and more dominates the current discussion of the rail transport service with its different aspects
- Nearly all state-owned transportation companies are not competitive yet particularly regarding their cost structures
- In order to survive in the transportation market it is essential to be prepared for a successful competition with other rail transportation companies
- Finding the own strengths and weaknesses based on a comparison with other rail transportation companies is a fundamental precondition for a successful corporate strategy
- The aim of the "Strategic Competitive Analysis" is to examine costs and productivity performances as well as to deduce indications of improvement possibilities

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The strength of the BSL company analysis is based on a mature methodology and a comprehensive knowledge of the industry

BSL benchmark approach (1)



The BSL benchmarking combines several advantages

BSL benchmarking approach (2)

BSL benchmarking provides ...

- transparency of costs and performance,
- a strength and weakness profile,
- improvement possibilities

BSL benchmarking is a ...

- competition orientated,
- holistic,
- tangible,
- Quality and cost and revenue orientated

position-fixing of the company

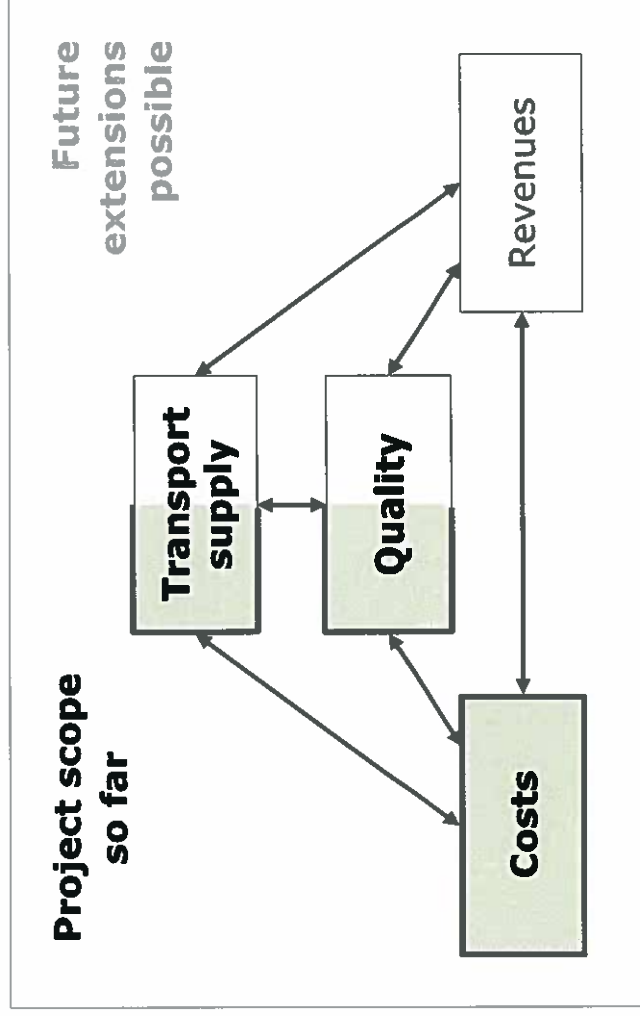
BSL benchmarking is the basis for a ...

- regionally/(inter-)nationally adjusted,
- company orientated,
- socially balanced,
- coordinated

over-all company strategy

The business analysis approach suggested here is an addition to the benchmark

Main aspects of business analysis

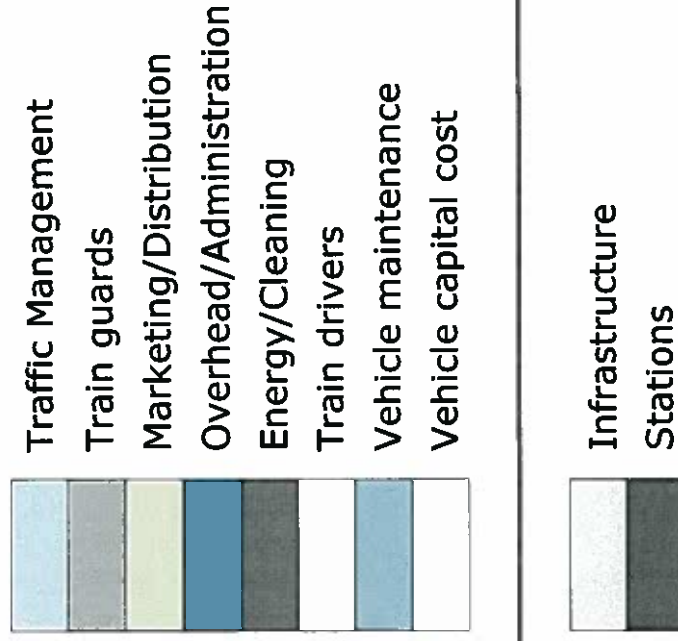


- Focus on costs and partly productivities
- Consideration of transport supplying terms of measurable key service parameters
- Application of quality KPIs if available (no comprehensive quality benchmarking)
- Basic idea: learning from "best-practice"
- Detection of improvement potential

The focus of the benchmarking is the operating function which is usually put on tender

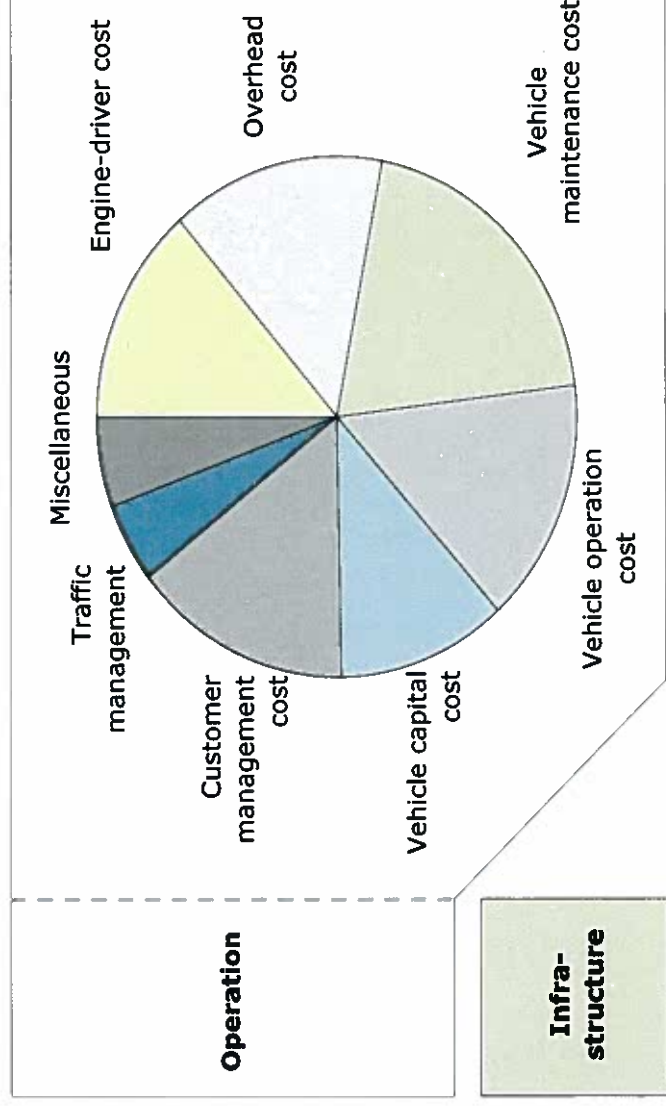
Cost structure by functions

PRINCIPLE
CONSIDERATION



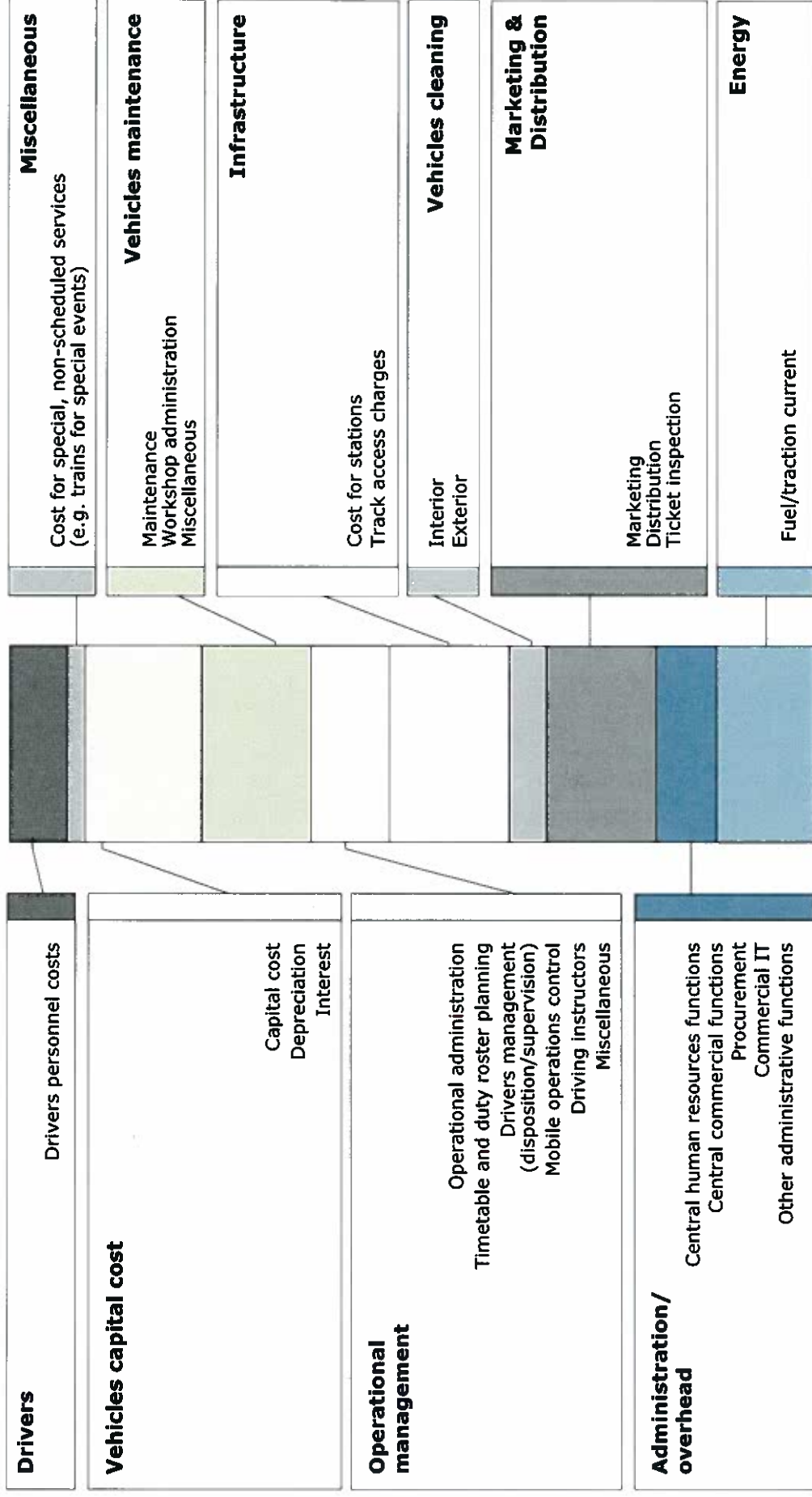
To generate a solid comparison, the costs of each analysed company are allocated to the BSL cost structure

Scheme of the cost structure



- The basis for qualified benchmarking is the classification of costs into a proven function cost structure developed by BSL
- This guarantees a comparability of data from different transportation companies regardless of their organisational structure and their cost accounting system

BSL's function-related cost structure is based on the typical processes of a transportation company



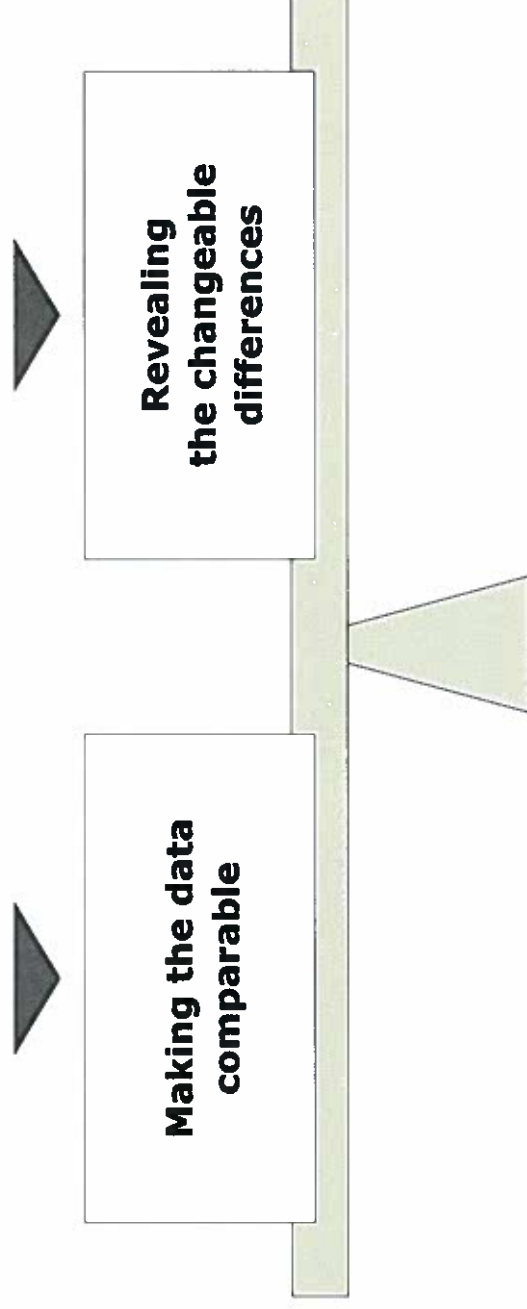
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The art of benchmarking consists of assuring comparability without going in to "levelling mania"

Reassessment and normalisation approach

Reassessment and normalisation of circumstances that are not changeable by the company for some time to come

No normalisation of parameters that are controllable by the company



Creating comparability and at the same time finding the differences which are changeable (improvable)

Reassessed and normalised cost data is necessary for an appropriate comparison

Schematic illustration of reassessment and normalisation

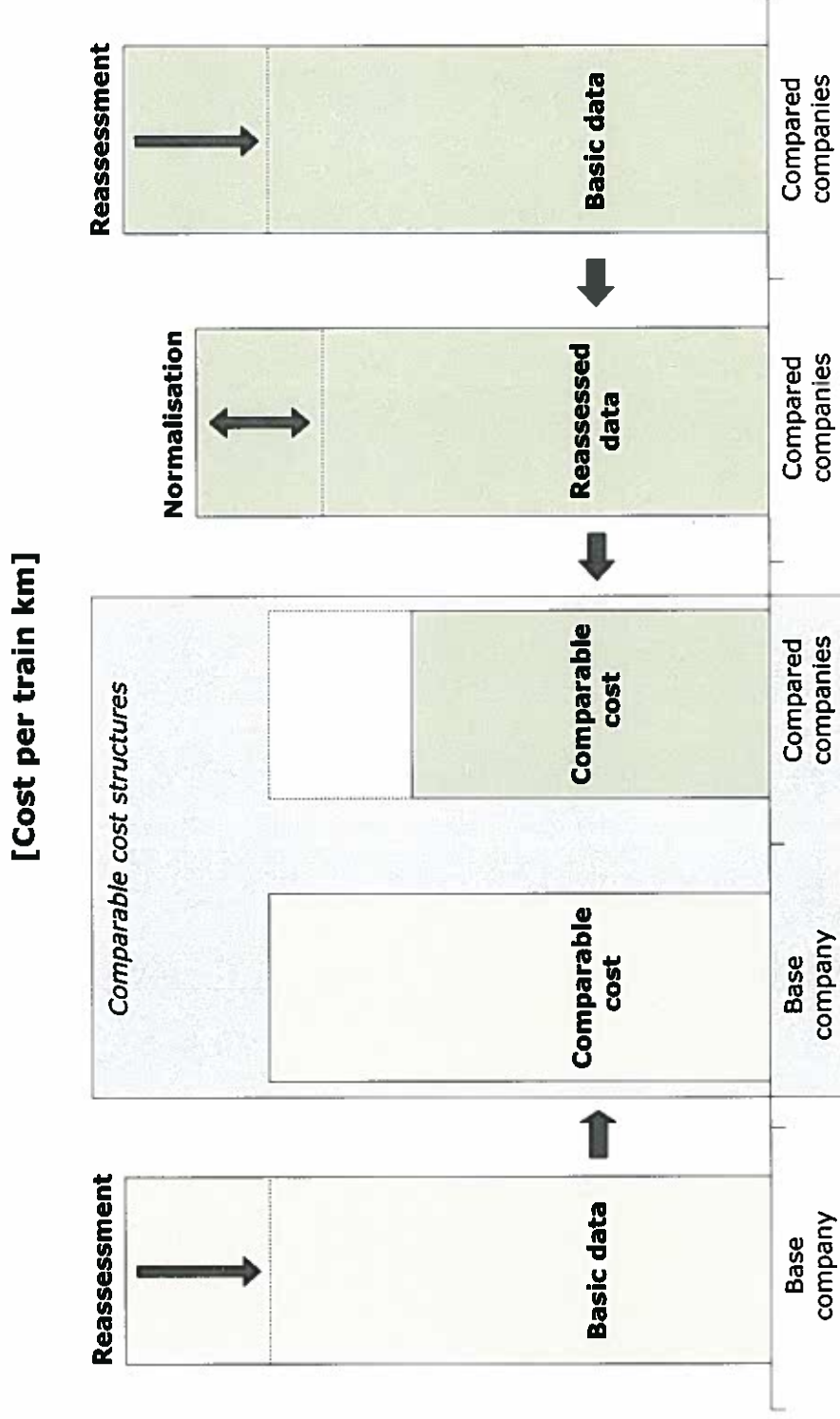
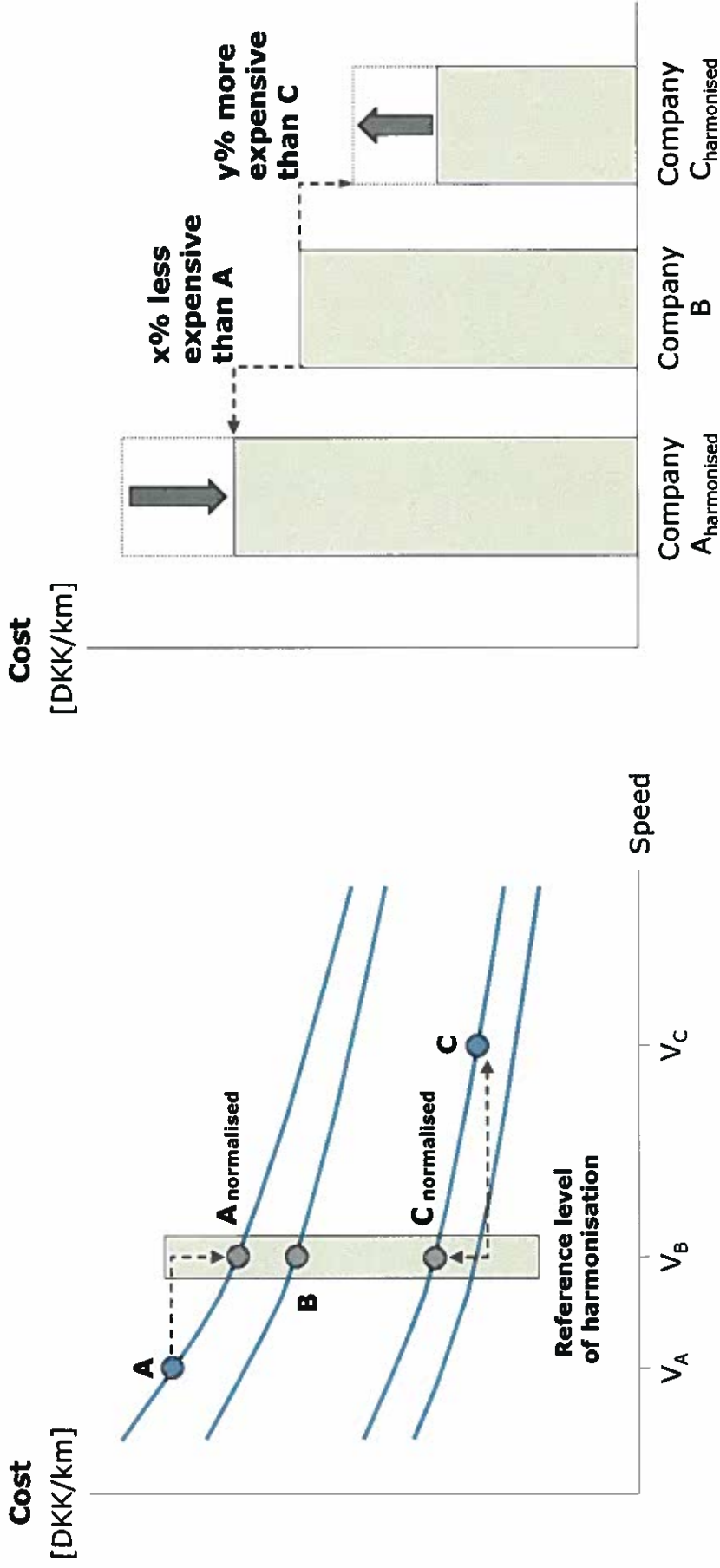


Illustration of the normalisation process, using the example of driver service costs

Scheme of normalisation by adjusting the differences in speed



▲ Only normalised train driver cost data is comparable

International cost benchmarks need to be based on meaningful currency conversions

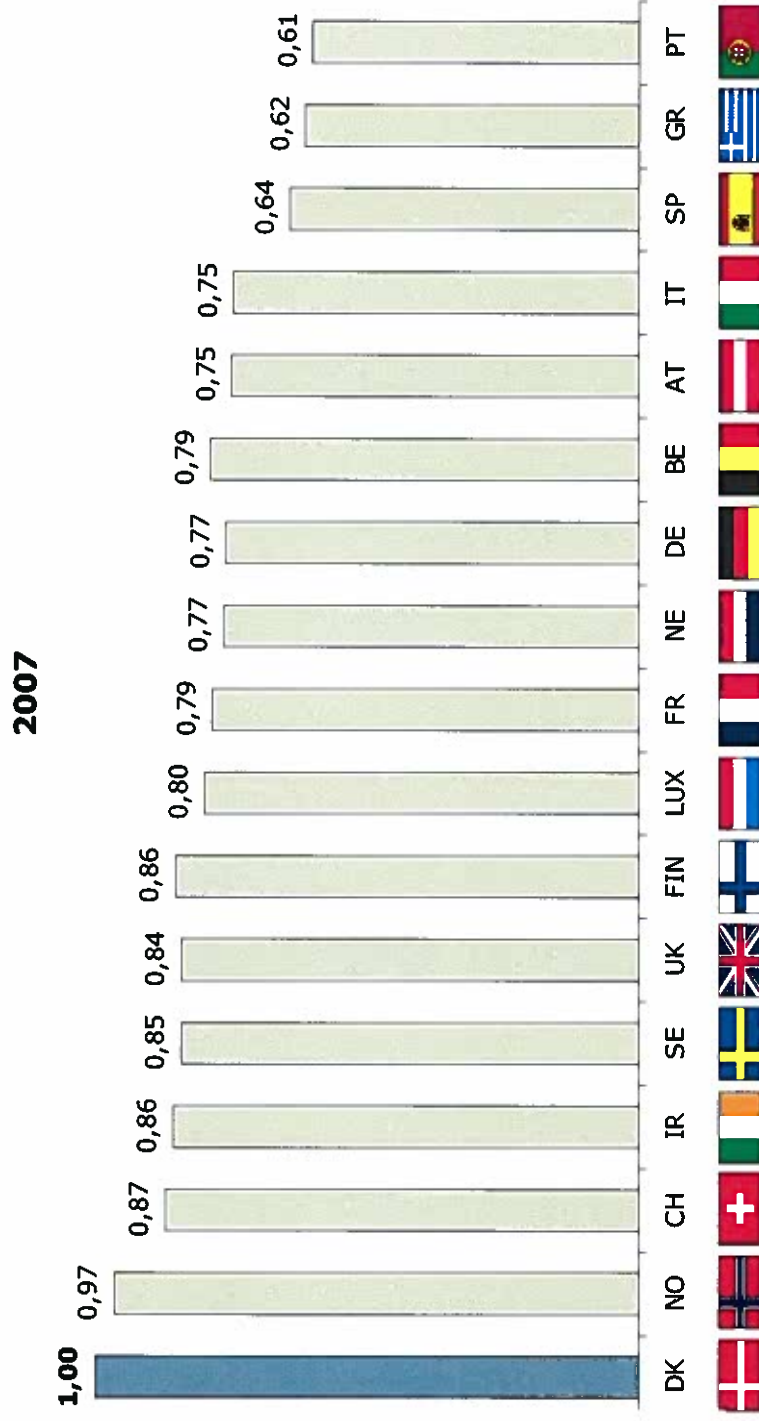
Comparative price levels (1)

- Often, income or Gross Domestic Product (GDP) levels across countries are compared by applying exchange rates only
- However, exchange rates only partly reflect relative prices of goods that are domestically consumed - many other factors such as interest rates and capital flows shape exchange rates
- Purchasing Power Parities (PPPs) are currency conversion rates that both convert to a common currency and equalise the purchasing power of different currencies. In other words, they eliminate the differences in price levels between countries in the process of conversion. To do so, prices of a basket of comparable and representative goods and services are compared across countries
- PPP normalise the respective national cost level that cannot be influenced by the companies. In terms of productivities it is assumed that the companies can influence them. Therefore productivities are not normalised
- Under the joint OECD-Eurostat PPP Programme, the OECD and Eurostat share the responsibility for calculating and publishing PPPs
- To achieve even more comparability for benchmarking, BSL usually applies so called "Comparative Price Levels" (CPL). These CPLs are PPPs which are referenced to a specific currency (e.g. DKK)

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Denmark has a very high price level, which has to be taken into account

Comparative price levels (2)



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Cost functions are normalised by Purchasing Power Parities (PPP) and travel speed

Parameters of normalisation

Function	Parameters of normalisation
Train drivers	: Purchasing Power Parities & travel speed
Train guards, Personnel on platforms	: Purchasing Power Parities & travel speed
Admin and overhead	: Purchasing Power Parities
Traffic management	: Purchasing Power Parities
Cleaning	: Purchasing Power Parities
Marketing and distribution	: Purchasing Power Parities
Fleet maintenance	: Purchasing Power Parities
Infrastructure	: Purchasing Power Parities
Fleet capital cost, energy	: Not normalised ¹

1) Fleet capital cost are based on global prices, not national/local ones. Energy cost are highly politically driven

Benchmarked data of all companies are treated highly confidential

Confidentiality specification

- Confidentiality of the data and the benchmarking results is a central requirement of the companies
- All information provided is treated with absolute confidentiality, ensuring that no one will be able to determine the identity based on the figures provided
- Therefore the results of the benchmarking distributed to DSB and BCG are solely anonymous by using letters as a substitute for the railway's names (A – X)
- Additionally, the letters are alternating between the functions to avoid back tracing
- Within one function (Train drivers, cleaning, administration, etc.), the same letter is used to support cross-checks between different figures/pages

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 - **General**
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 - Rolling stock
 - Administration
 - Other

Intercity and regional traffic have a share of 35% in total transport performance, S-tog about 30%

DSB's basic figures 2007

		Total	IC	Regional	S-tog
Passengers¹	[m #]	148	8	51	89
Transport performance	[m train km]	50,5	17,3	18,3	14,9
Vehicle² performance	[m vehicle km]	232,8	100,6	66,4	65,8 ⁵
Capacity³	[m seat km]	15.195	5.092	4.628	5.475
Drivers	[#]	1.649	453	667	529
Locomotives	[#]	48	-	48	-
Train-sets	[#]	365	114	116	135
Coaches	[#]	210	-	210	-
Total fare revenues	[m DKK]	3.891	2.055	781	1.055
Total costs⁴	[m DKK]	6.350	2.297	1.718	2.256

- 1) Source: DSB Annual Report
- 2) Number of single vehicle/coach, not train-sets
- 3) Based on split of litrakm between IC and regional trains
- 4) Without VAT (moms)
- 5) Provided vehicles per train-set of S-tog (8 and 4) are calculated as 0,5 vehicle (4 and 2) to have nearly the same length of vehicles as the benchmarks to ensure the comparability

Source: BSL Management Consultants 21

The provided DSB cost are compared with several differing European companies

Benchmark assumptions

- Costs and service are reassessed figures from DSB. IC and regional costs are based on ABC, S-tog data is based on accounting
- Costs are based on a full cost model, including all costs related to train operations but without international trains, Øresund trains and trains to Bornholm
- All facts and figures are based on annual data for 2007, except noted otherwise
- DSB's costs are separated into Intercity-services, regional services and S-tog. Where available, necessary and useful the individual costs and productivities are considered, otherwise the total volume is analysed
- Benchmarked are cost and productivities of different European passenger train operating companies, both
 - with and without competitive environment
 - private and state owned companies
 - local and global operators
 - long distance, regional and S-tog traffic rail service providers
- The shown benchmarks are a sample of different companies which are managed from a commercial view or are even competitive

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The cost categories provided by DSB to BSL were allocated to cost functions

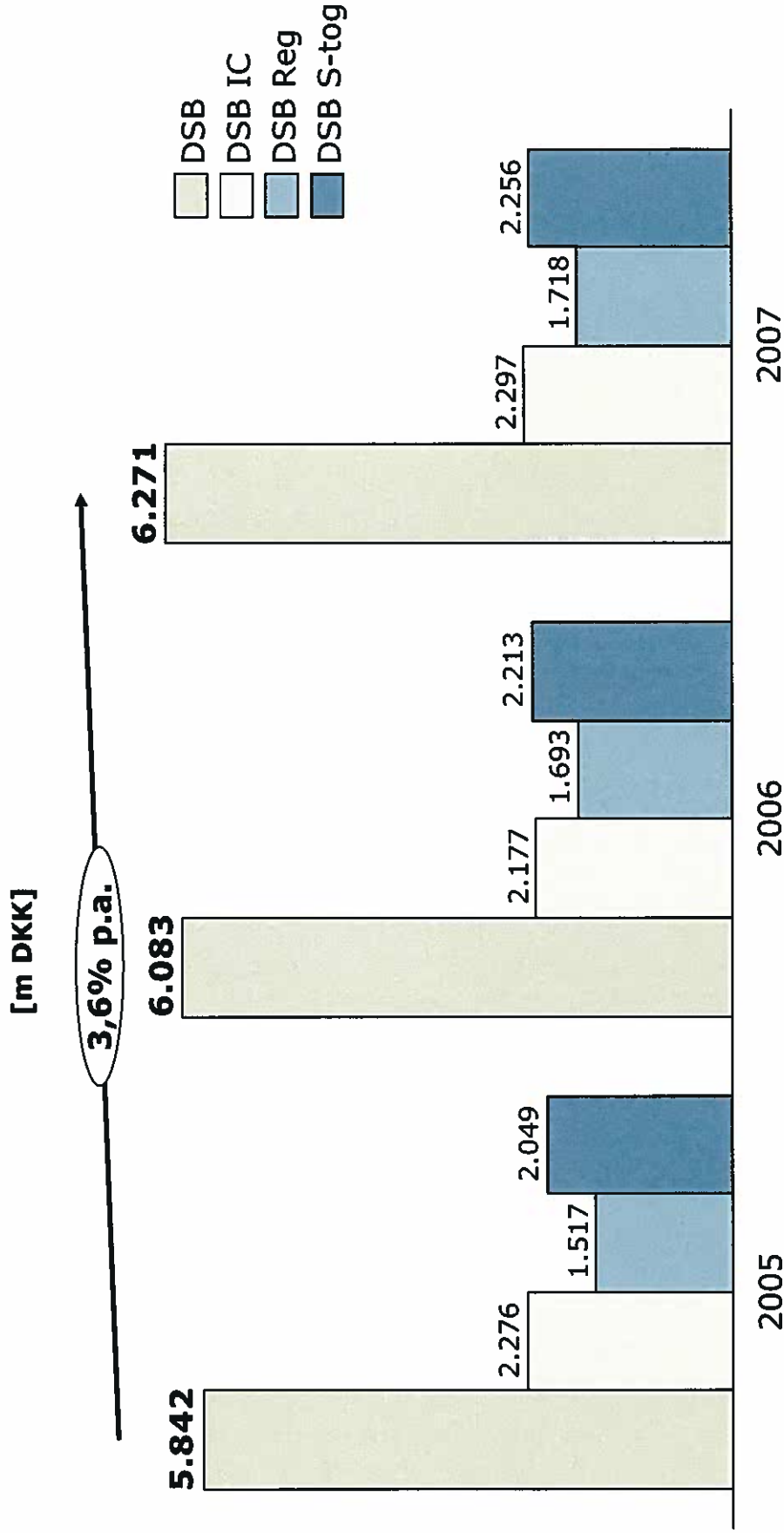
Cost allocation

DSB cost categories	BSL cost functions
HQ	Administration
IT	Administration
Staff, accounts department (overhead)	Administration
Staff, human relations department (overhead)	Administration
Staff, other (overhead) day-to-day running	Administration
Cleaning	Cleaning
Drivers and other costs of conveying	Drivers
Energy	Energy
Infrastructure	Infra
Workshop, maintenance	Maintenance
Workshop, Other	Maintenance
Workshop, planned maintenance	Maintenance
Workshop, planned maintenance (life cycle)	Maintenance
Workshops	Maintenance
Marketing	Marketing, distribution
Sales and distribution incl. personnel	Marketing, distribution
Other direct cost	Other
Catering	Other
Staff, planning (overhead)	Traffic Management
Train guards and personnel on platforms	Train guards
Depreciation of rolling stock	Vehicle cap cost
Financial costs	Vehicle cap cost
Insurance of rolling stock	Vehicle cap cost
Lease of rolling stock	Vehicle cap cost
VAT; Moms	Not included

Total DSB costs increased from 2005 to 2007 of 3,6% p.a.

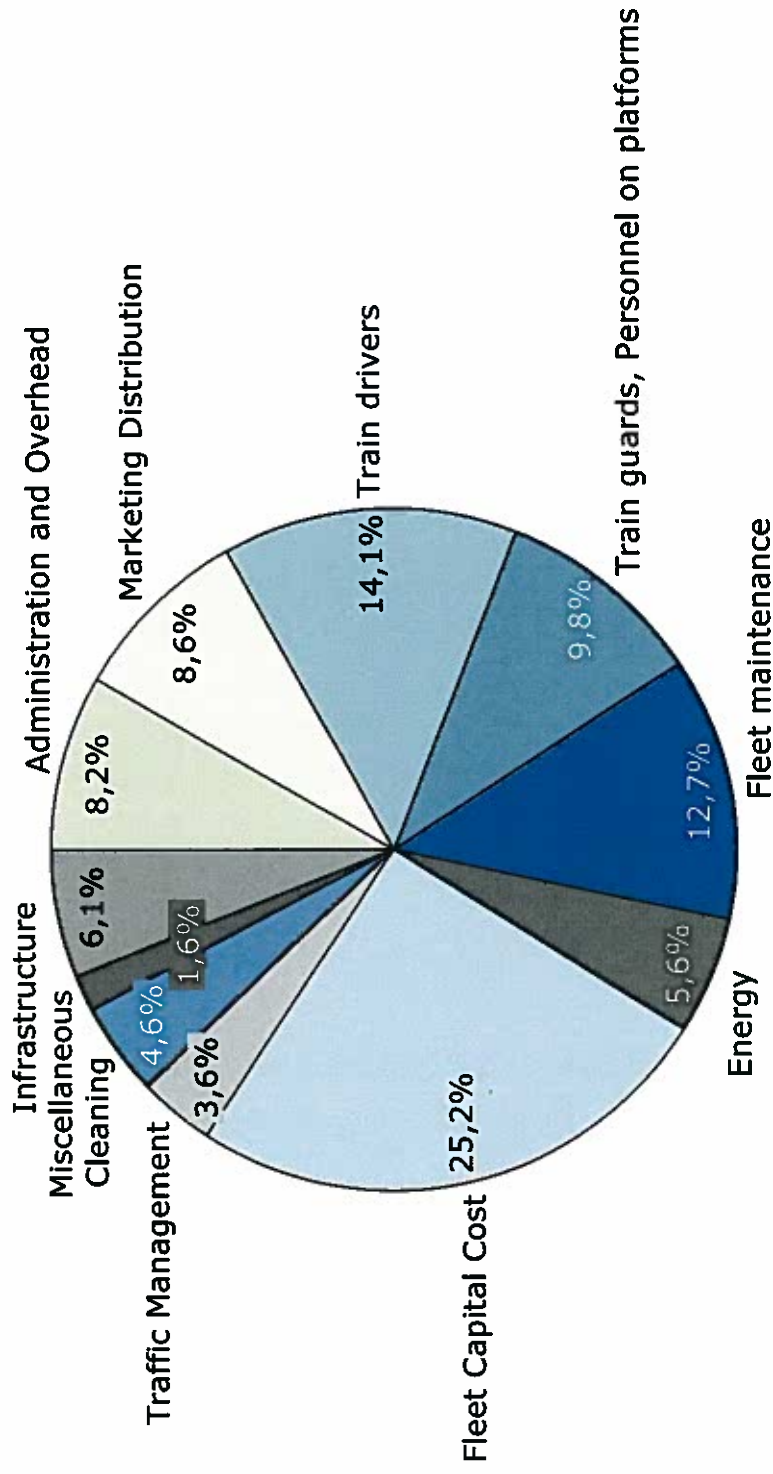
DSB costs development 2005 – 2007¹

TOTAL COSTS



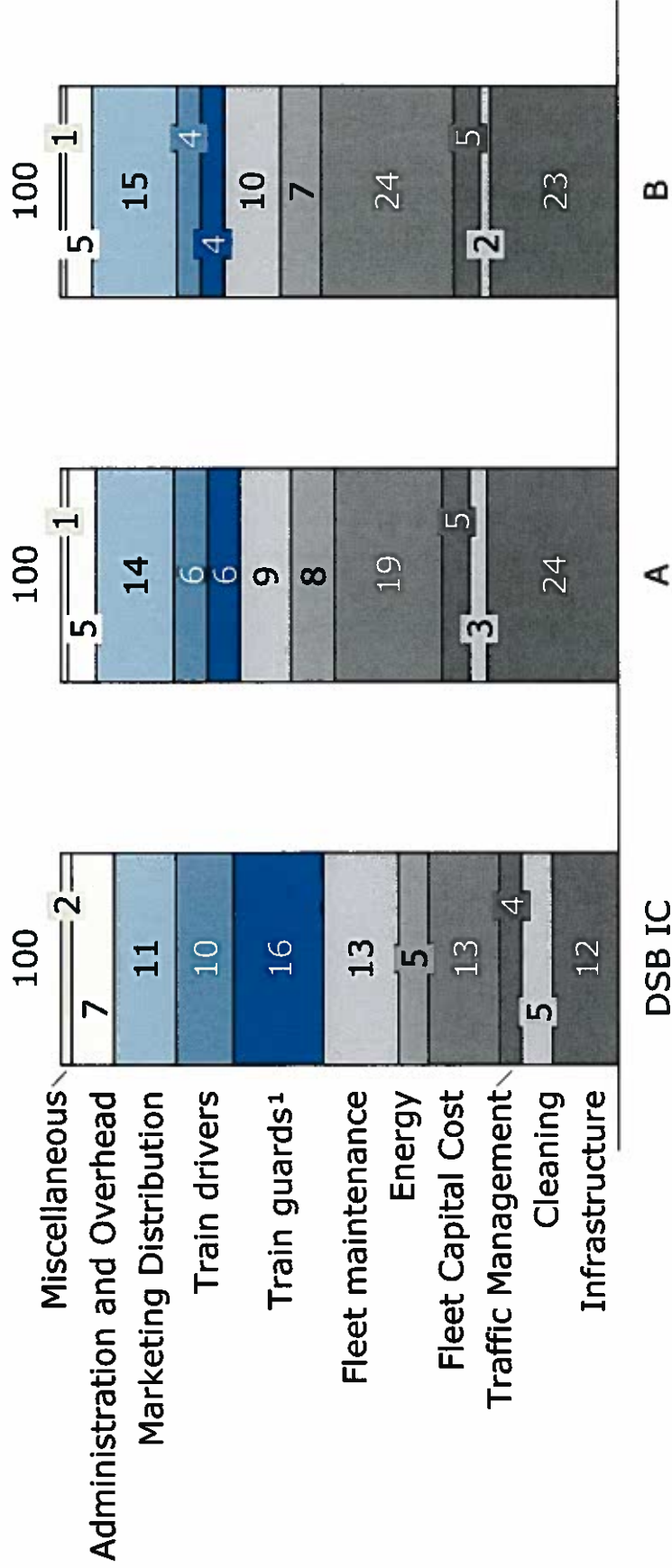
The rolling stock (fleet capital, energy, maintenance and cleaning) has a share in total costs of nearly 50%

DSB cost shares in % of total costs



The cost structure of DSB IC reveals differences to benchmarks especially in train personnel¹⁾, capital cost and infrastructure

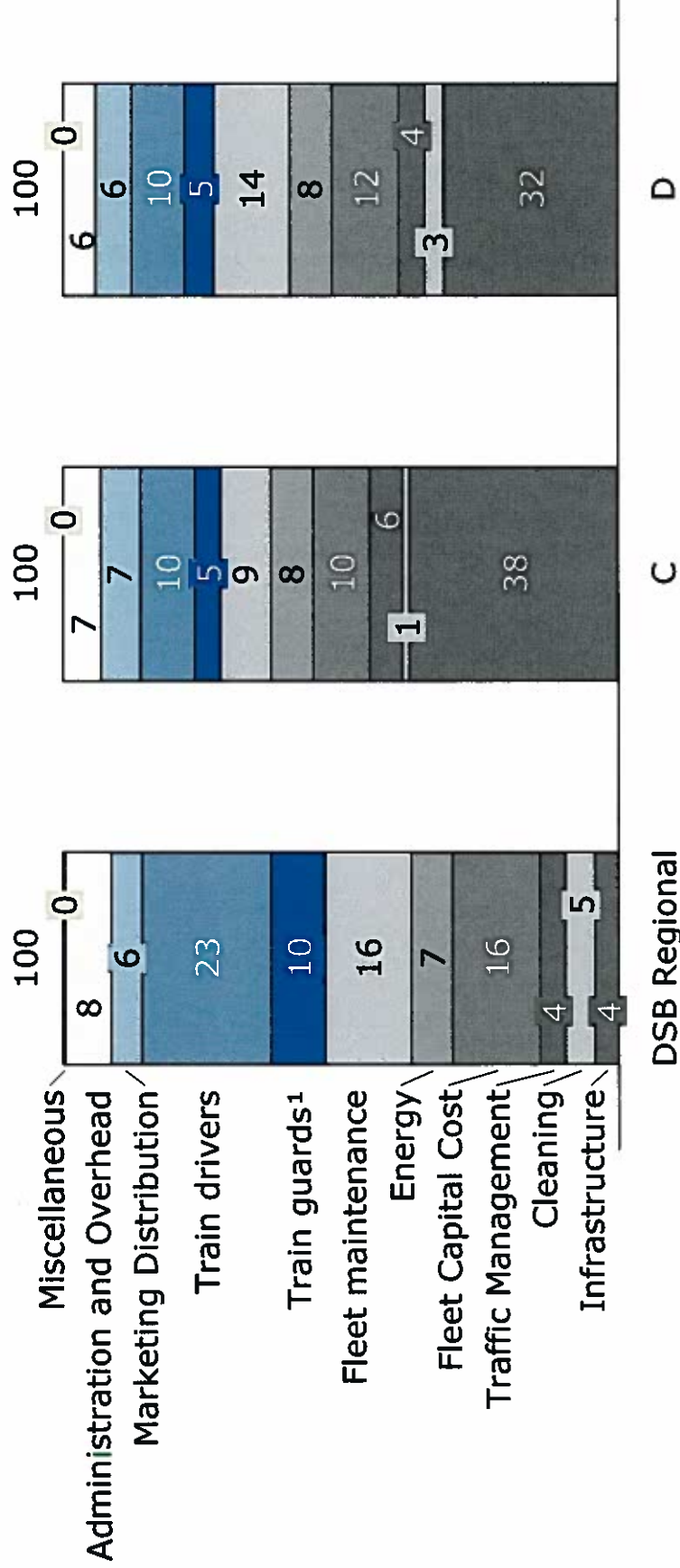
Long distance cost shares in % of total costs



1) Train drivers and train guards incl. personnel on platforms

DSB Regional's cost structure shows comparably high share of train driver cost and low infrastructure cost

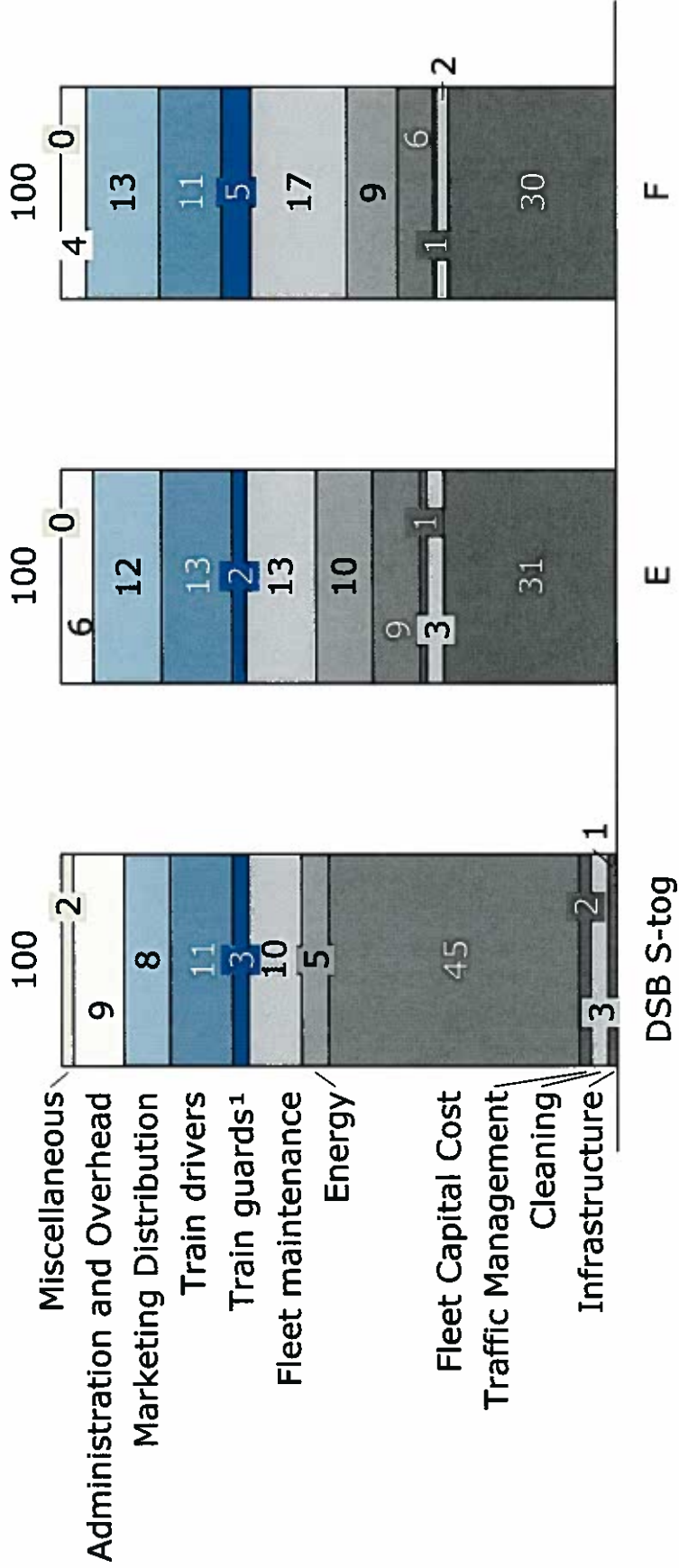
DSB Regional cost shares in % of total costs



1) Train drivers and train guards incl. personnel on platforms

DSB S-tog reveals high cost shares in fleet capital cost and low shares in infrastructure cost

DSB S-tog cost shares in % of total costs

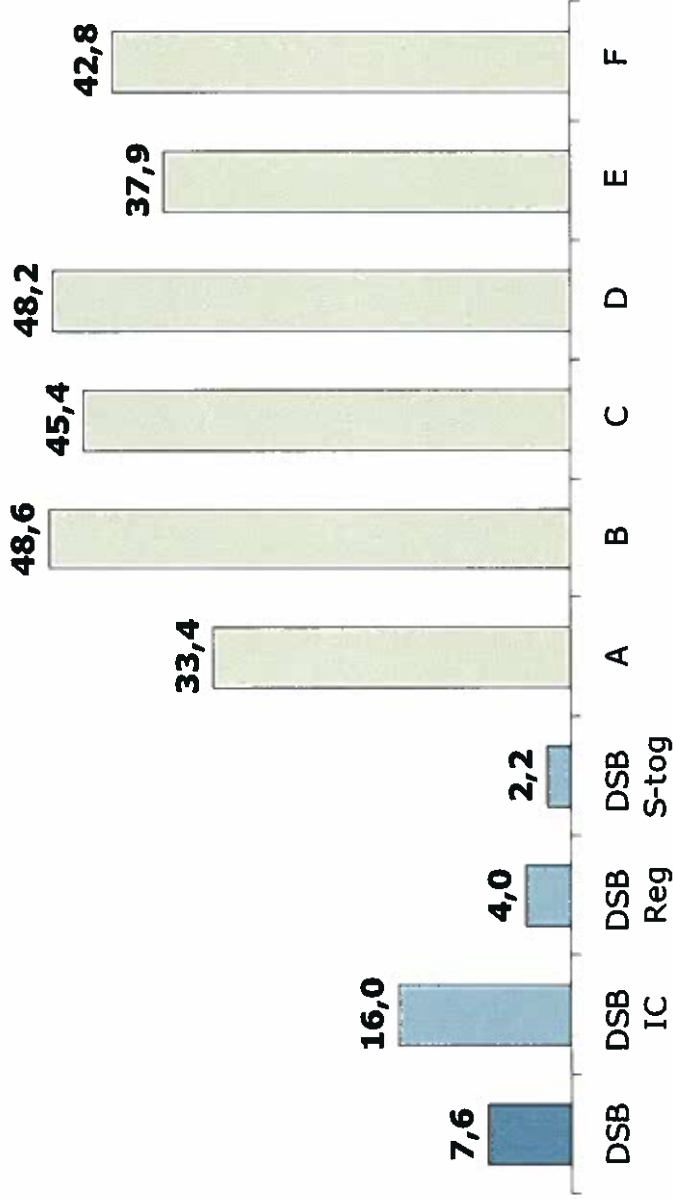


1) Train drivers and train guards incl. personnel on platforms

Infrastructure cost are separated in order to not distort the benchmark results

Total normalised infrastructure cost

[DKK per train km]¹⁾



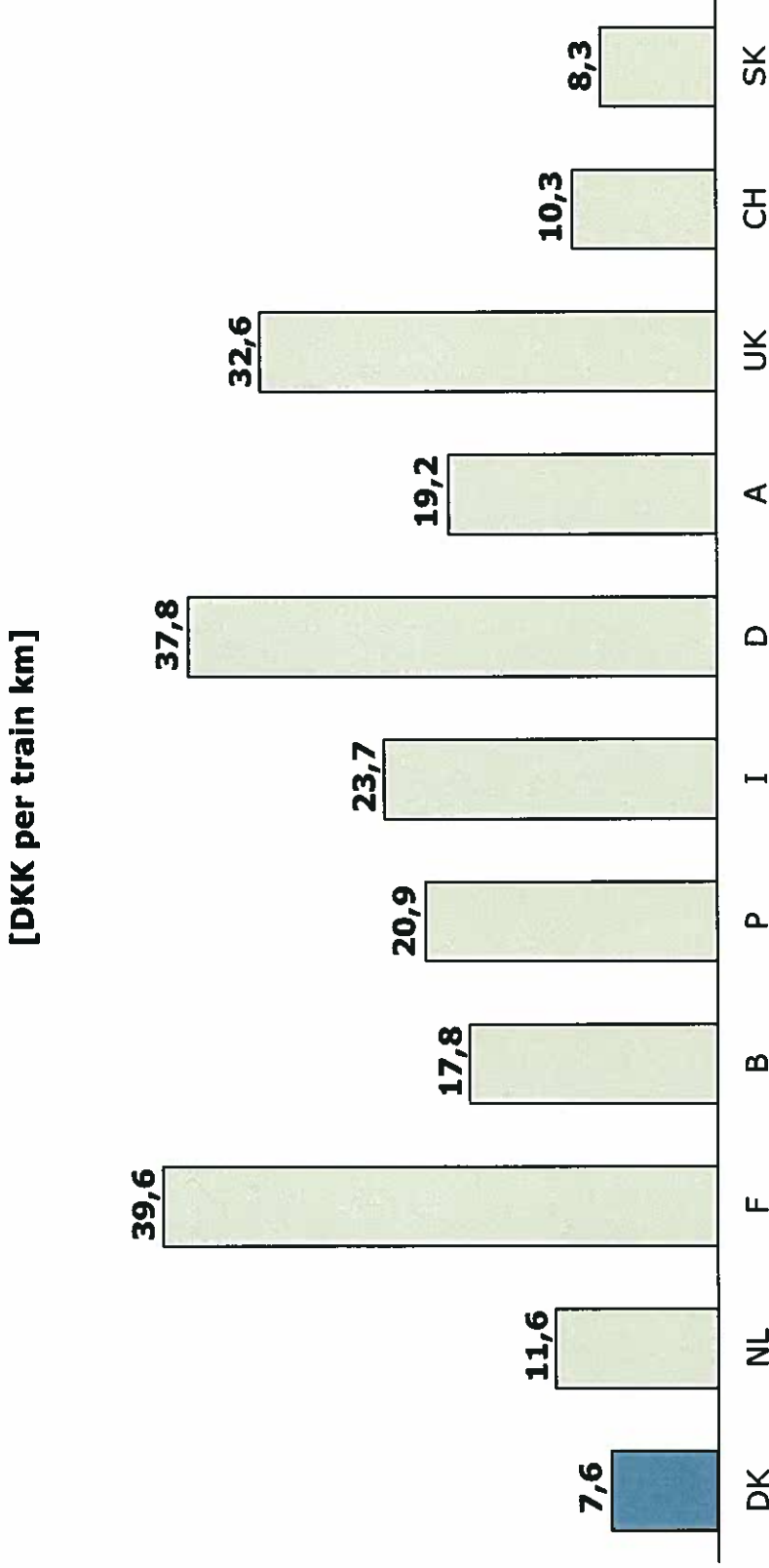
Remarks:

- The considered figures are infrastructure prices for the operating companies, which are independent from the cost of the infrastructure companies
- Common political prices often do not show the best-practise

The infrastructure prices for DSB are only a fraction of the price for other operators in Europe

The average track access charges for passenger trains in Europe are typically higher than in Denmark

Normalised average track access charges

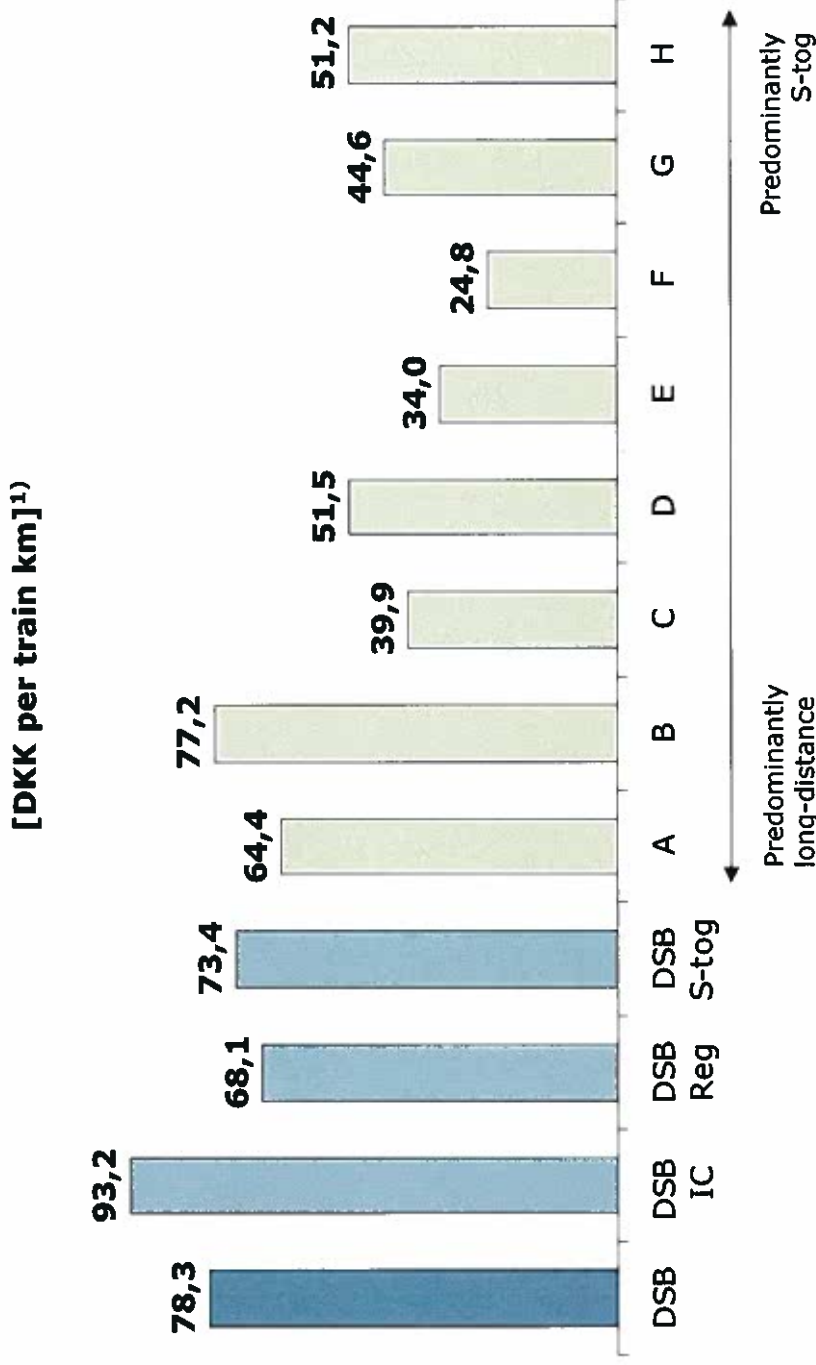


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Compared to international benchmarks, DSB's original costs are in the sample's high range

Not normalised total cost without infrastructure, energy and capital cost

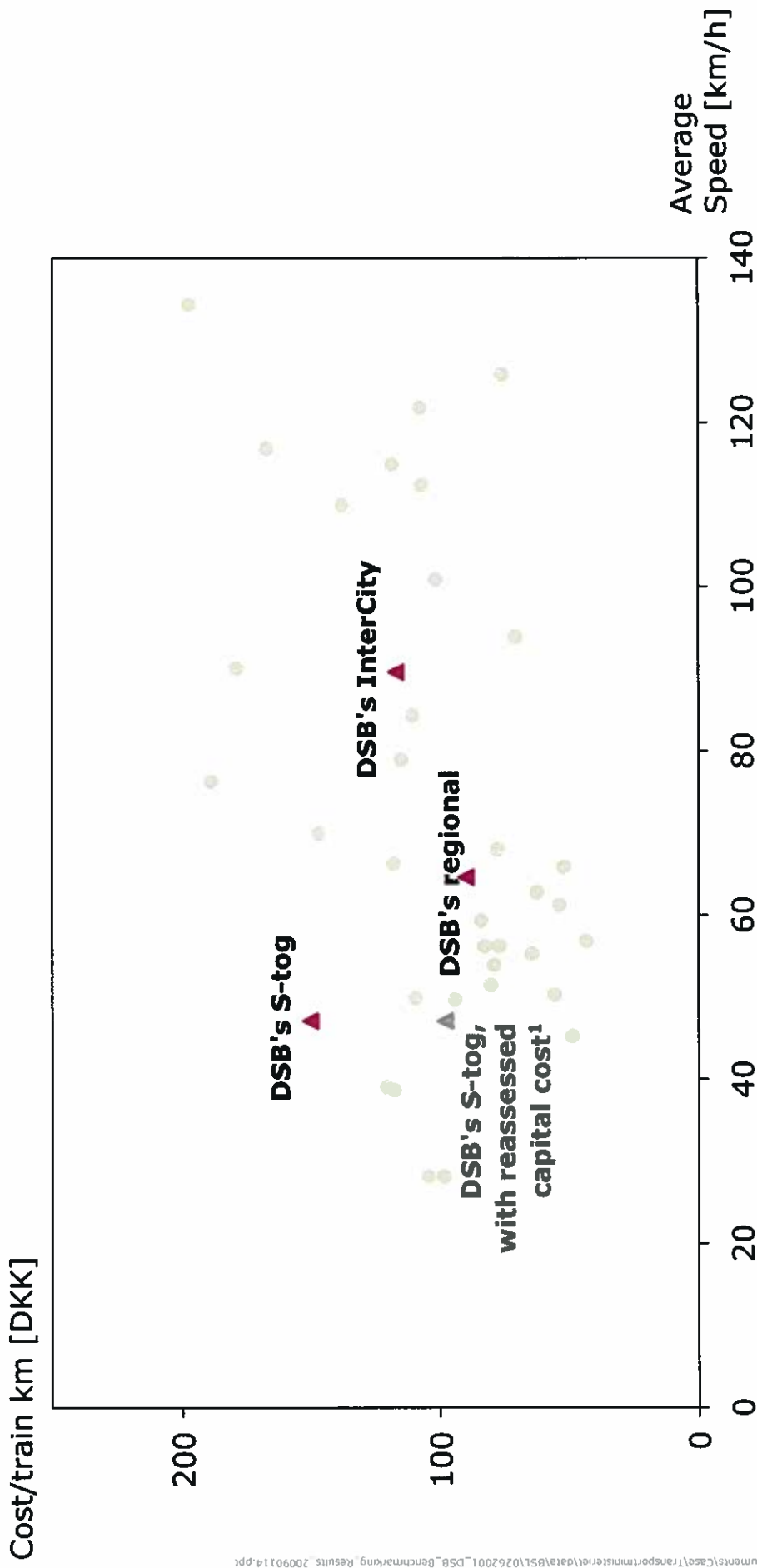


Due to different service structures and price levels the functional cost have to be normalised

1) Original costs without normalisation

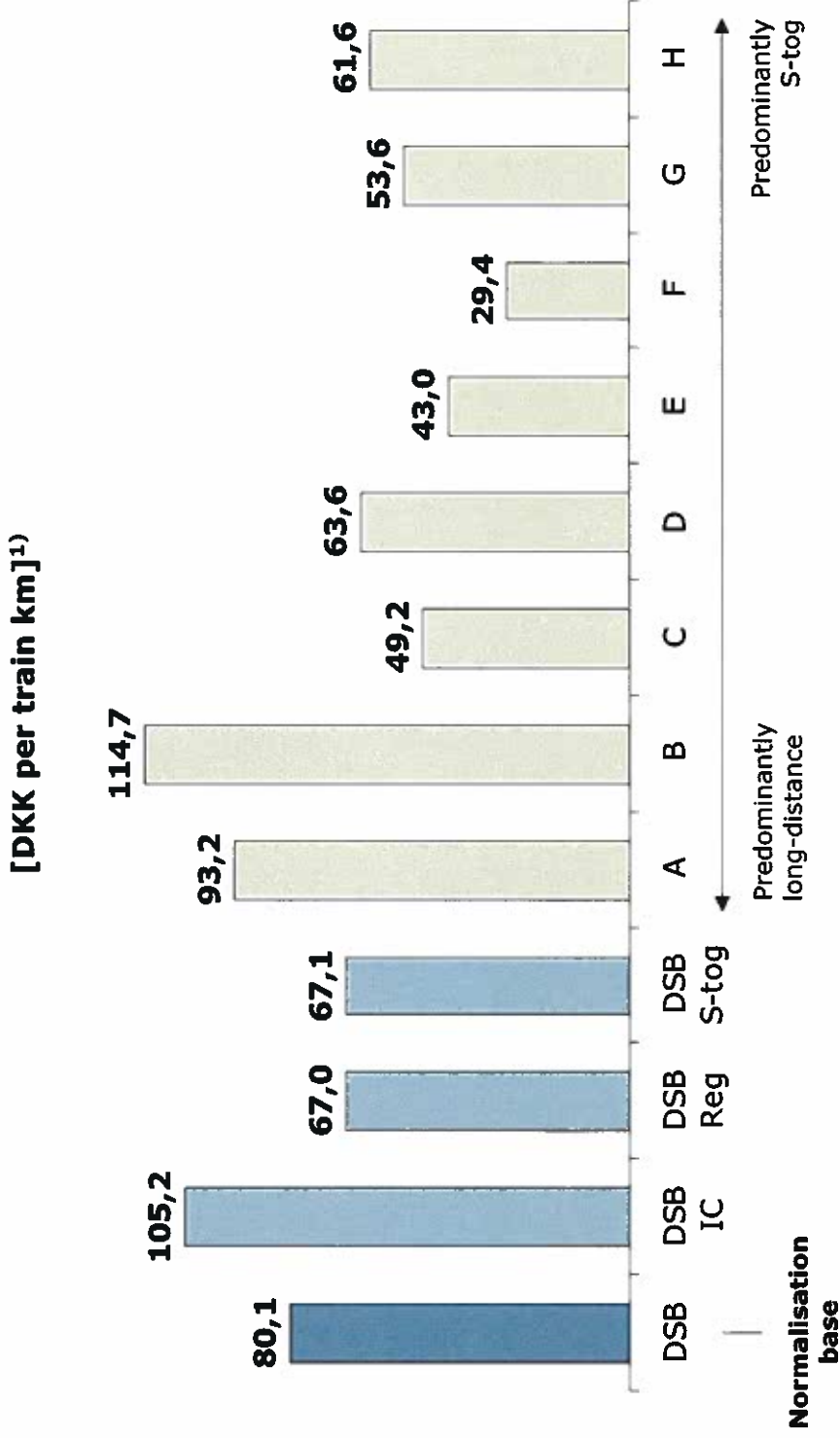
The cost of the benchmarks have a wide range, whereas most of them – especially for regional and S-tog – are lower

Total normalised costs excl. infrastructure costs per train km



The normalisation reduces the cost differential of DSB's total costs compared with the sample

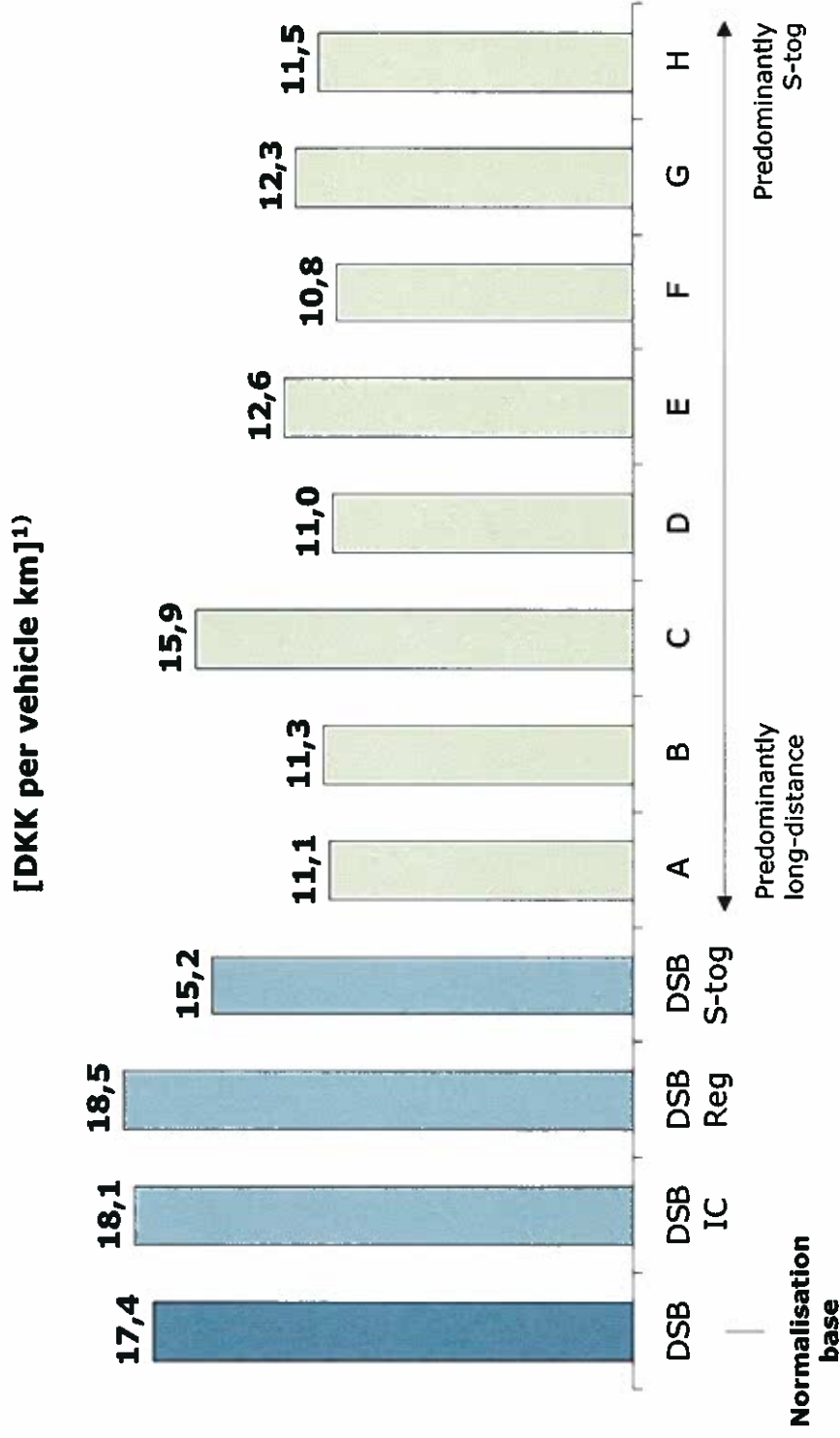
Normalised total costs without infrastructure, energy and capital cost (I)



1) Benchmarks are normalised by PPP and DSB's travel speed, DSB IC, DSB Reg and DSB S-tog by DSB's travel speed

Regarding the total costs per vehicle km, DSB services are nearly on the same level but above the benchmarks

Normalised total costs without infrastructure, energy and capital cost (II)

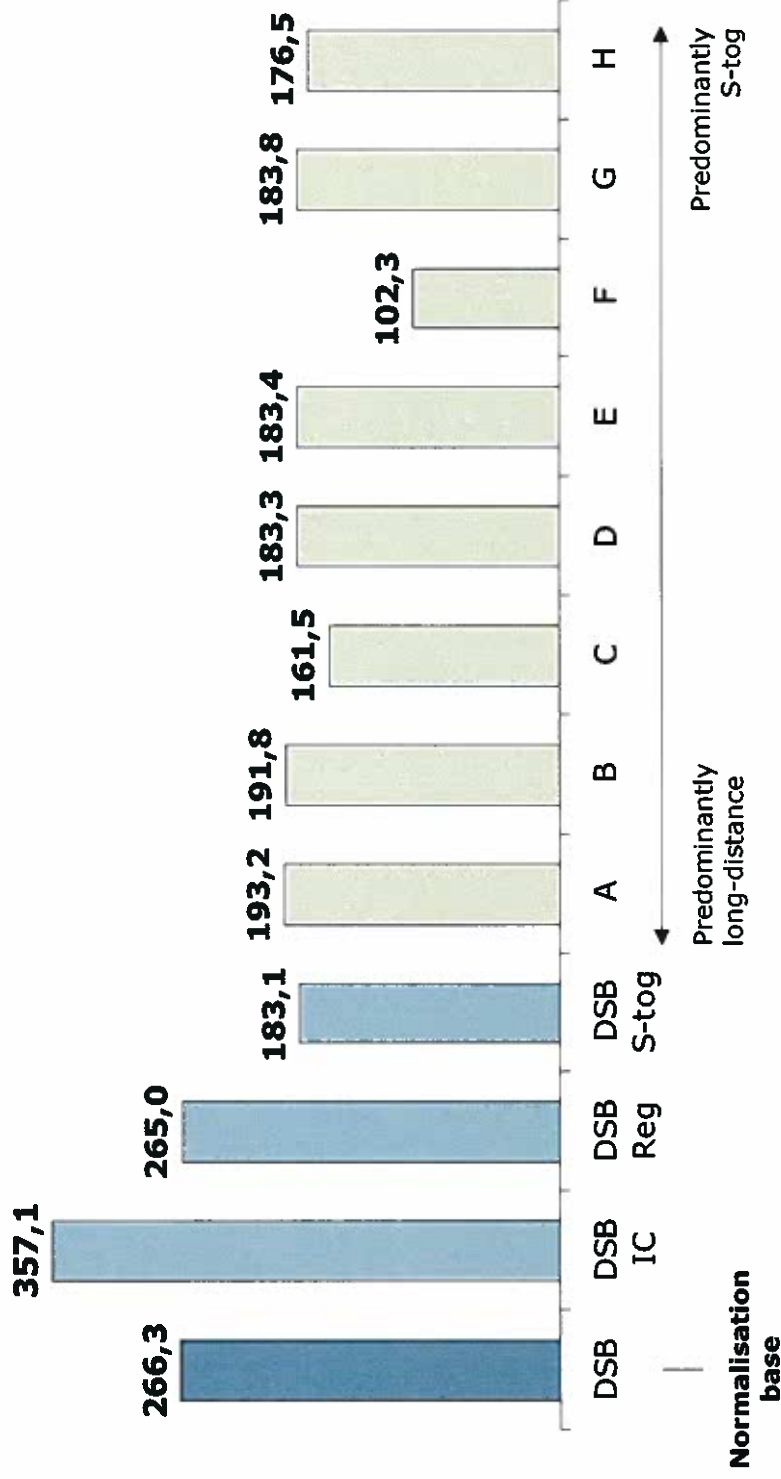


1) Benchmarks are normalised by PPP and DSB's travel speed, DSB IC, DSB Reg and DSB S-tog by DSB's travel speed

Based on the seat km the differentiation of the DSB series is very high

Normalised total costs without infrastructure, energy and capital cost (III)

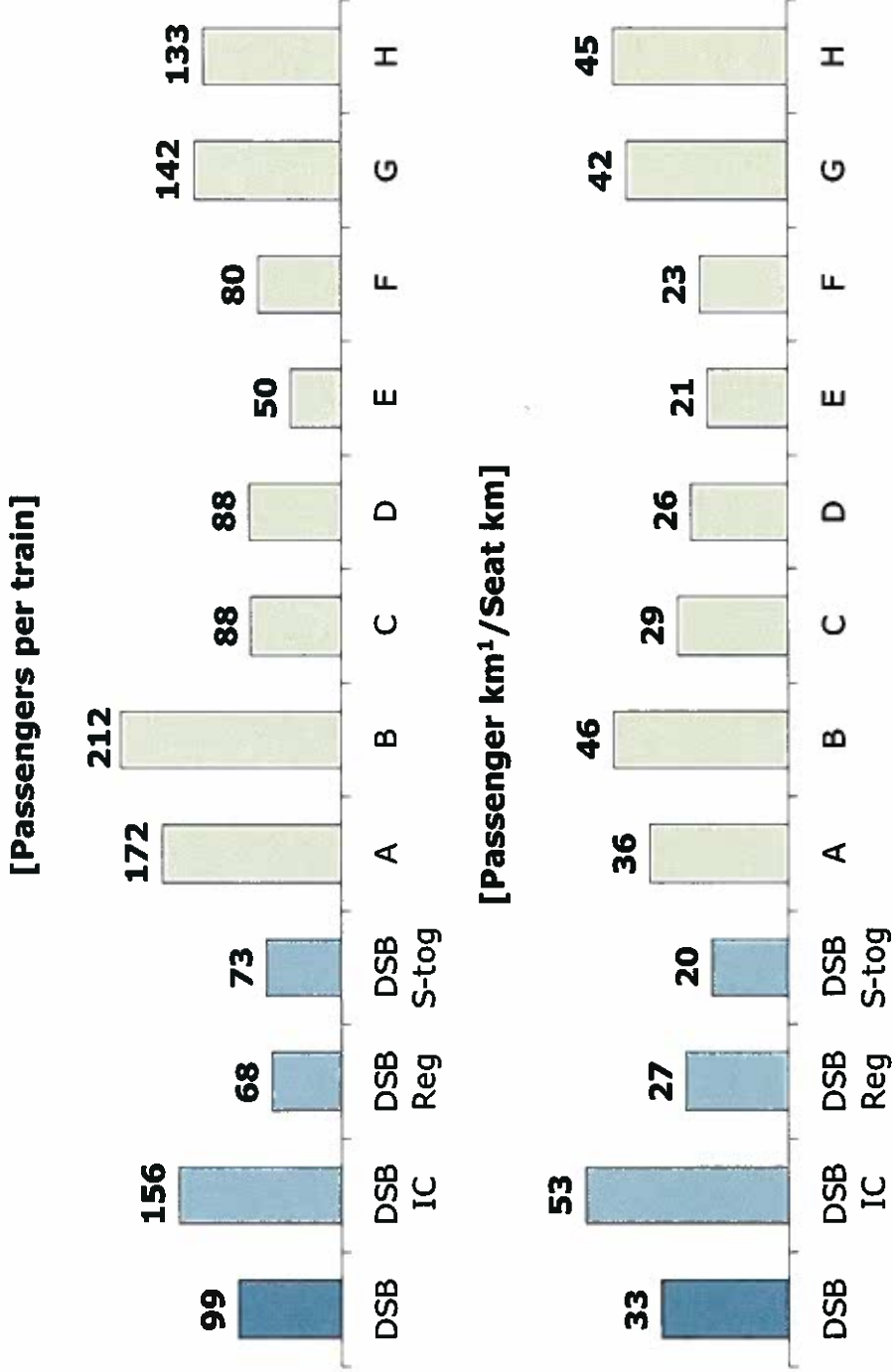
[DKK per 1.000 seat km]¹⁾



1) Benchmarks are normalised by PPP and DSB's travel speed, DSB IC, DSB Reg and DSB S-tog by DSB's travel speed

The utilisation of the S-tog seems to be very low compared to benchmarks and DSB regional

Passenger and utilisation ratios



1) Source: DSB annual report

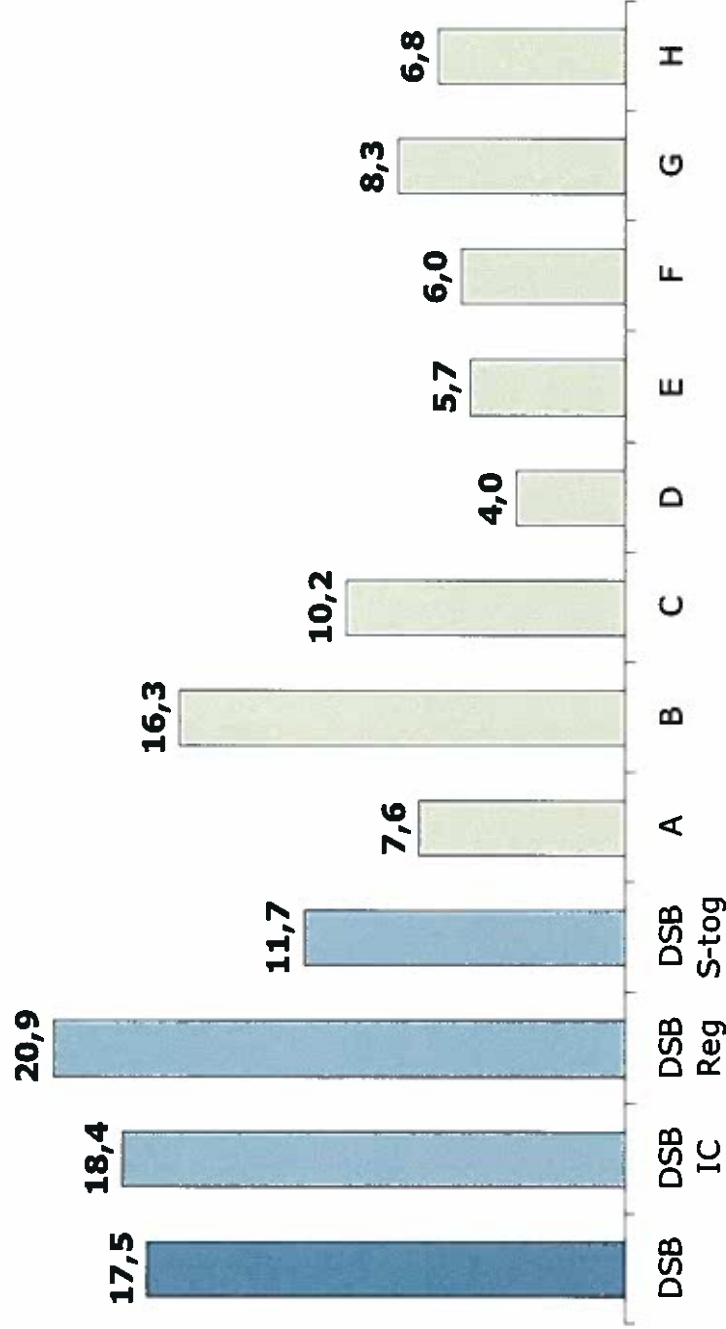
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 - **Train drivers/train guards**
 - Rolling stock
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 - Other

DSB train driver's costs are much higher than the benchmarks

Normalised train driver cost, incl. shunting¹⁾

[DKK/train km]²



Cost share: 14,1%

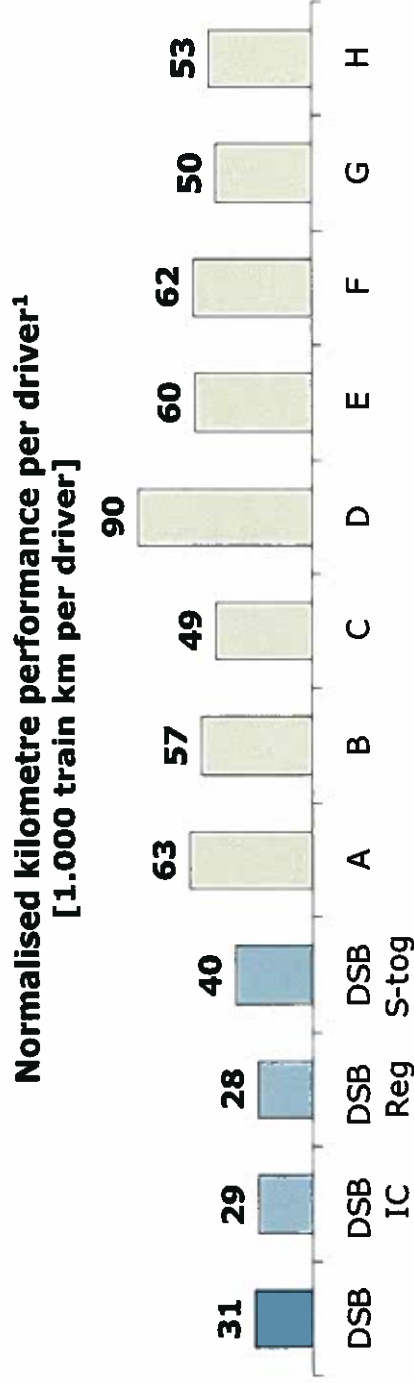
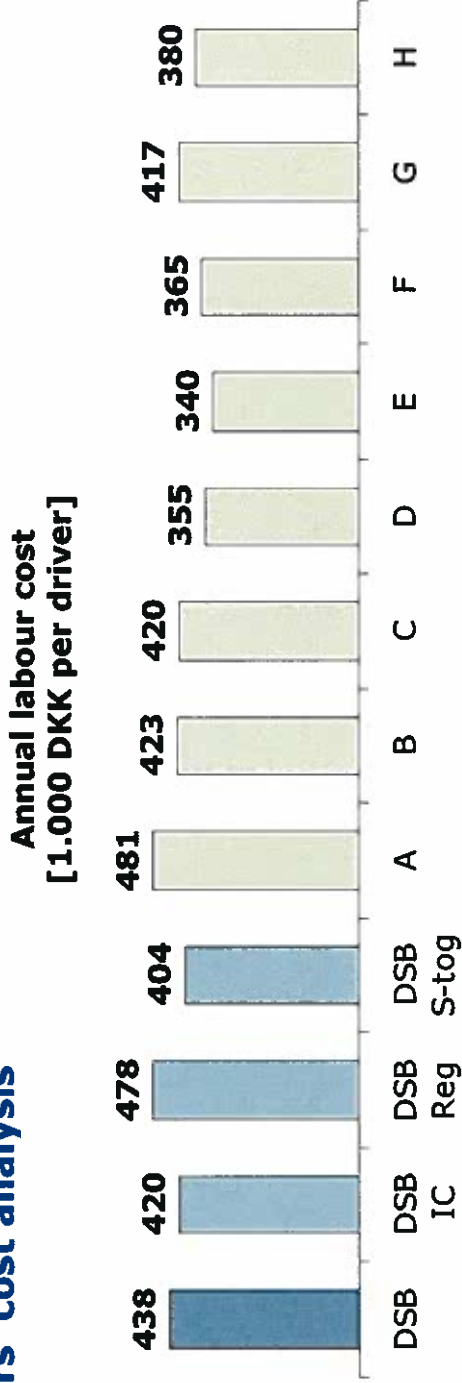
Cost drivers:

- Labour/operating agreement
- Average labour cost per driver
- Average net working time per driver
- Productivity
- Timetable efficiency
- Shunting effort based on vehicle type concept (loc/coach train or train sets)

1) DSB S-tog without shunting
 2) Benchmarks are normalised by PPP and DSB's travel speed, DSB IC, DSB Reg and DSB S-tog by DSB's travel speed

While DSB's average annual labour costs are slightly higher than the average, the performance per driver is very low

Train drivers' cost analysis

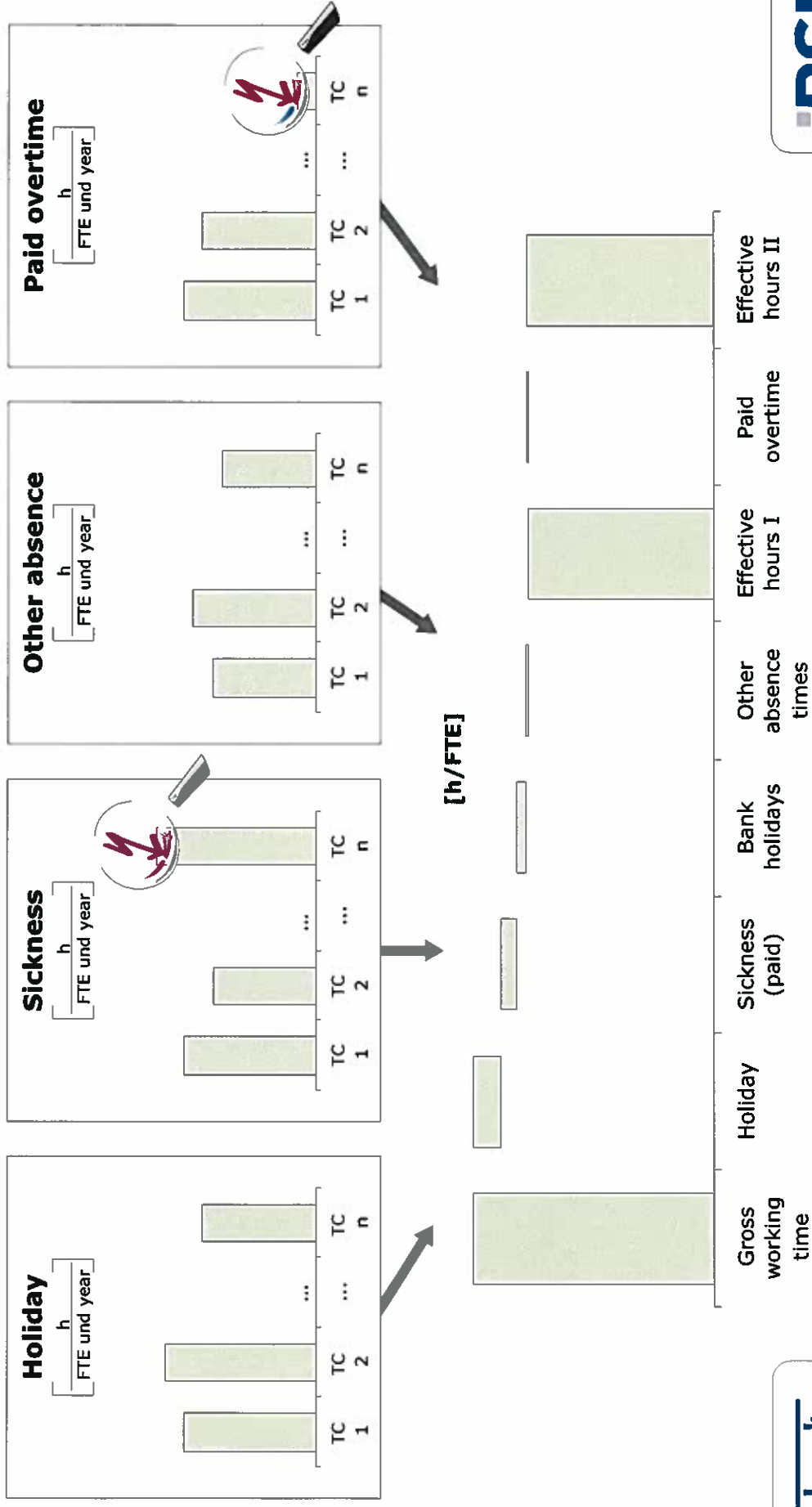


The discrepancy between DSB-services is noticeable

1) Normalised by speed; S-tog and the benchmarks only cover drivers, without shunting personnel

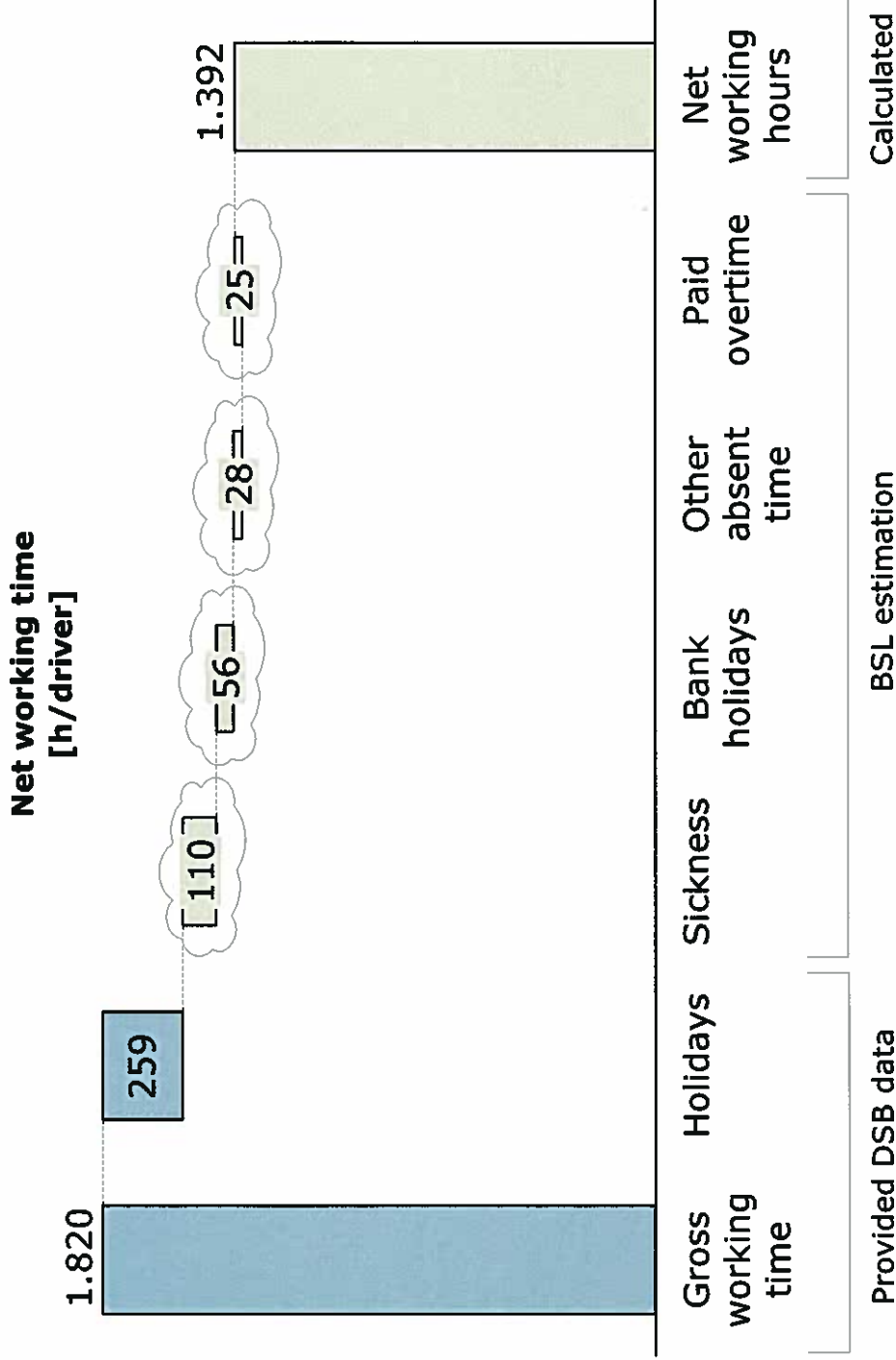
The personnel productivity "Effective working time" is one of the essential determining factors of the driver service

Example of effective working time calculation



DSB's net working time per driver is probably on a level of less than 1.400 hours per year

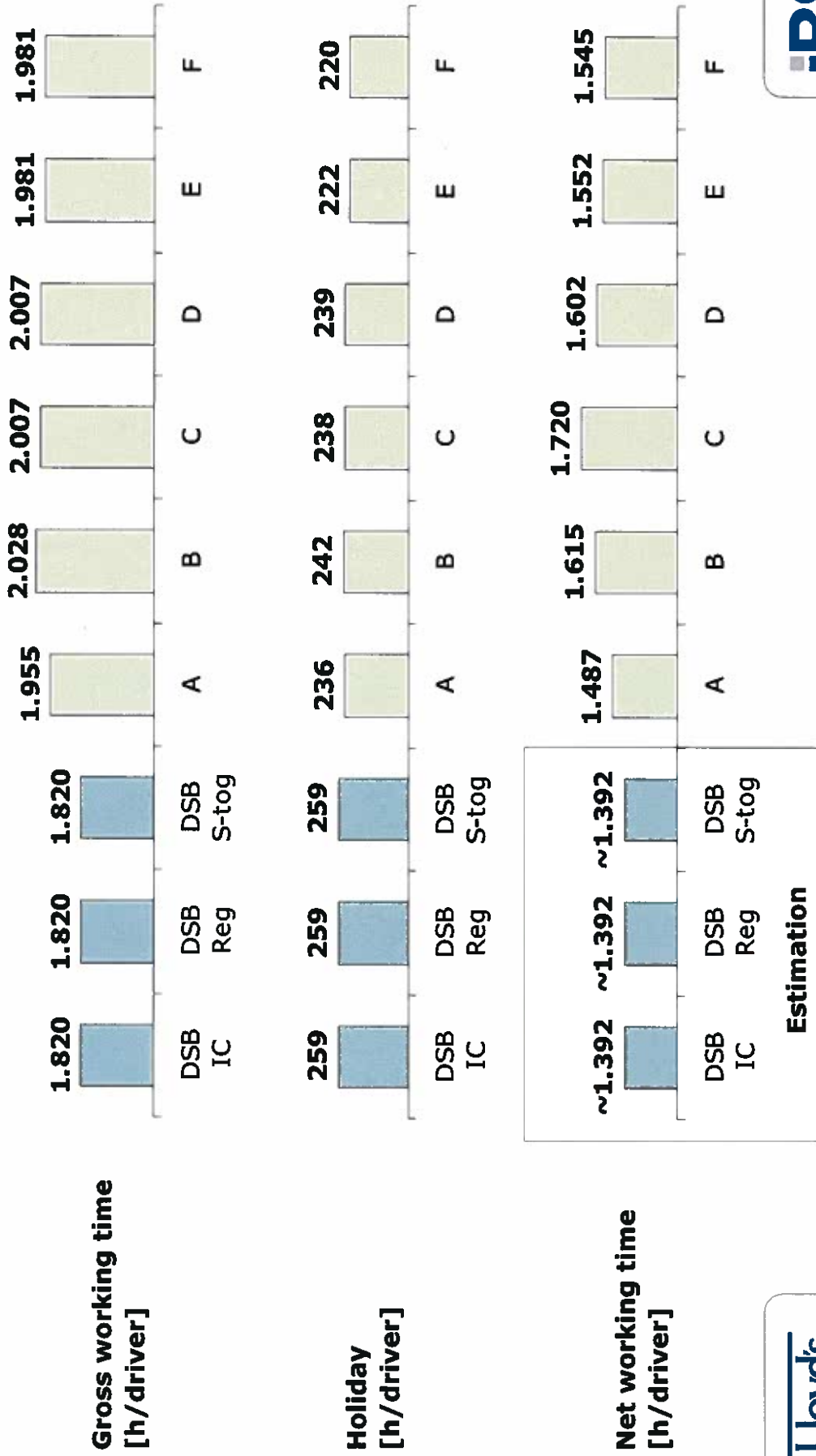
Calculation of net working time for DSB's train drivers



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DSB's low gross working time combined with its high holiday hours are leading to an estimated low net working time

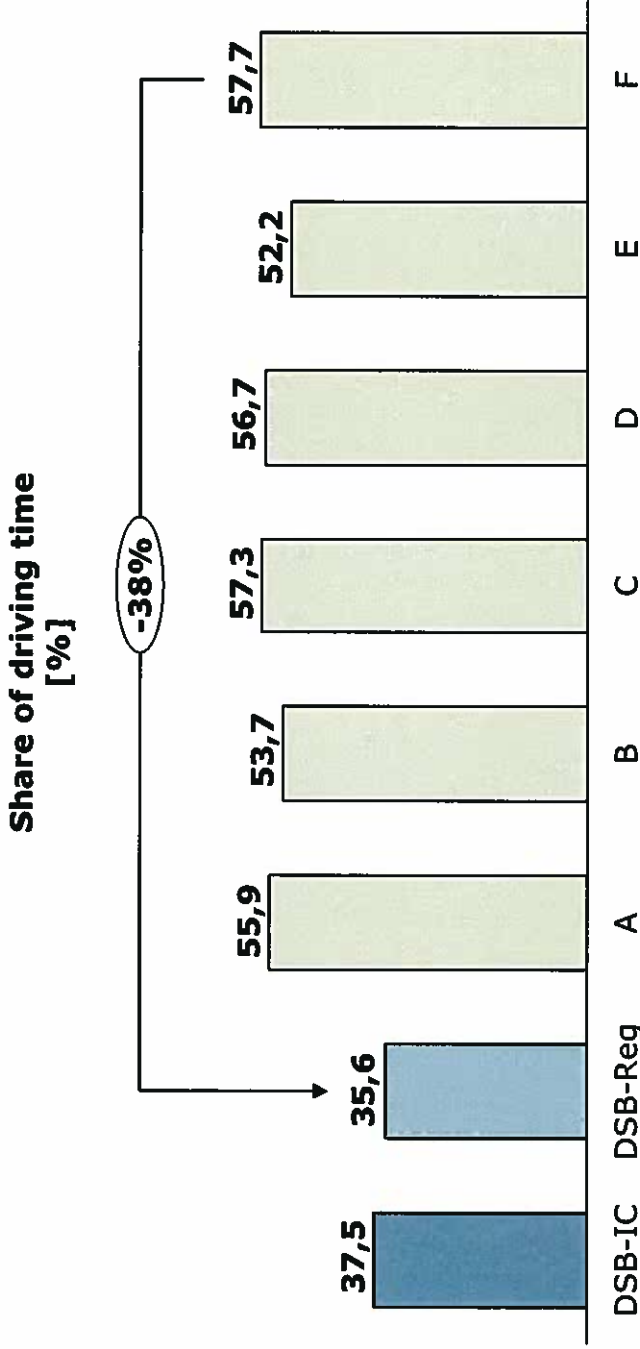
Working time



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DSB's shares of driving time are up to about 40% lower than the benchmarks

Shift element - driving time

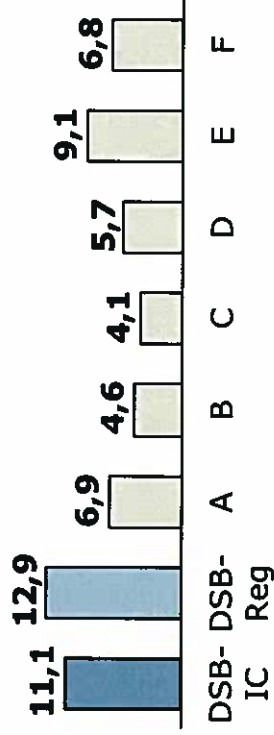


In order to assess the productivities of train drivers, the not or indirect productive shift elements has to be analysed (see following page)

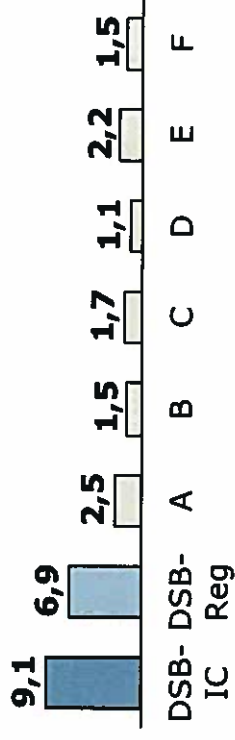
Particularly the technical and travel time shares of DSB are comparably higher than the benchmark values

Shift elements – selected times

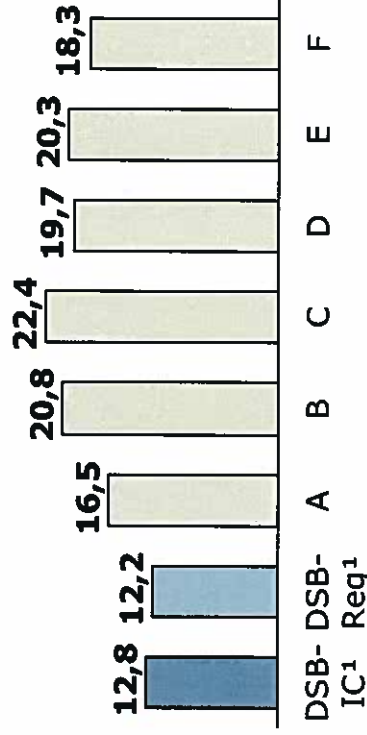
Technical start/end time [%]



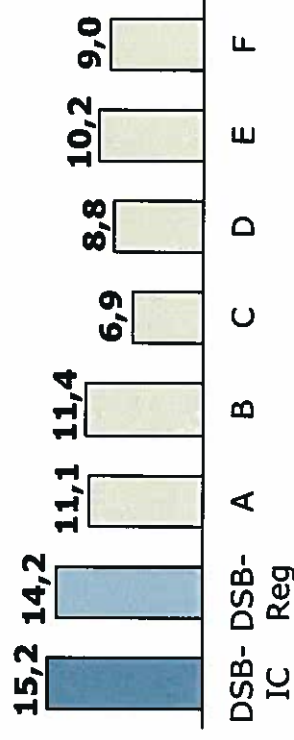
Travel as passenger [%]



Check in/out, walking to trains, breaks [%]



Waiting time and turnaround time according [%]

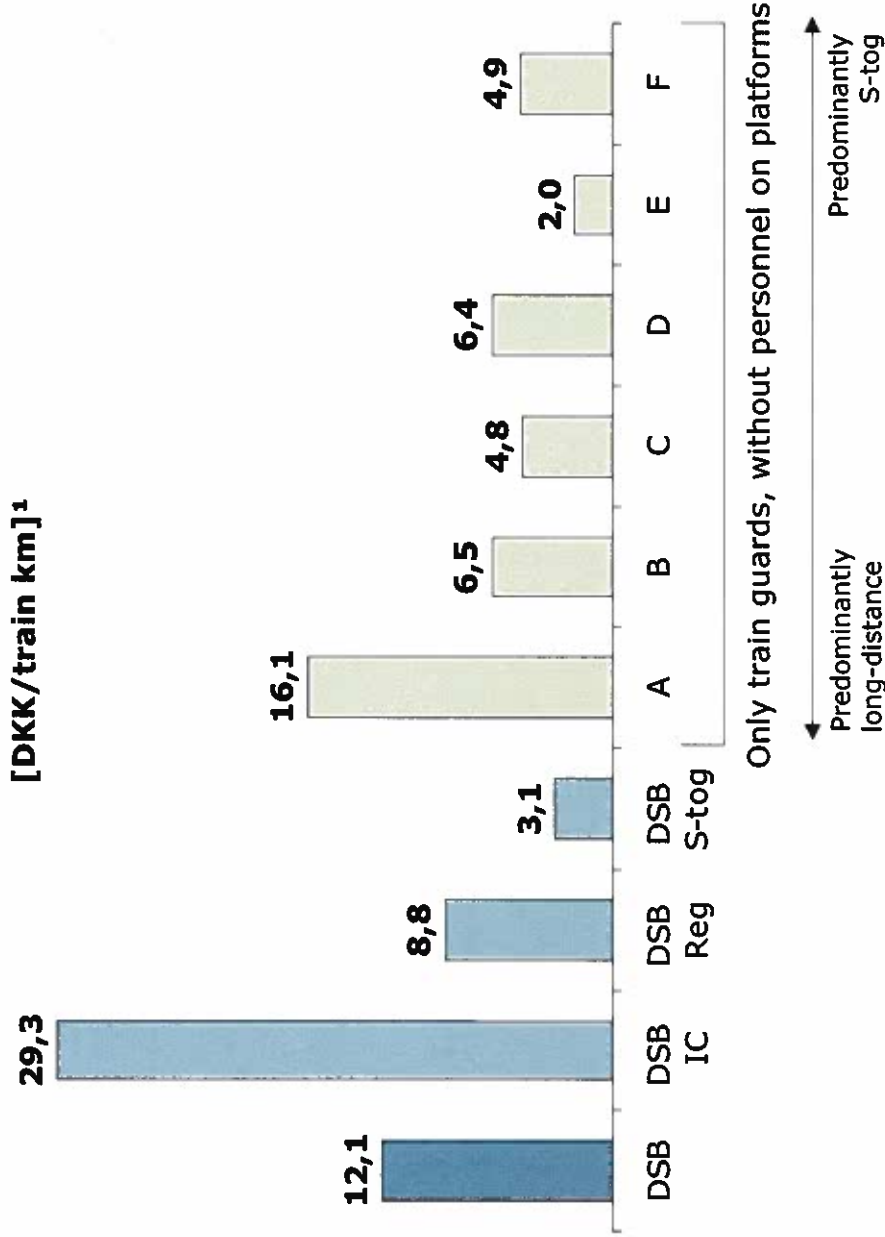


The figures only indicate areas of possible improvement potentials. The detailed allocation of shift elements might have to be revised. Therefore, a more comprehensive shift analysis is necessary for further conclusions

1) Incl. cleaning

Especially DSB's train guard costs of IC are far above the benchmarks

Normalised cost of train guards



Cost share: 9,8%

Cost Drivers:

- Train guard per train ratio
- Covered functions of the train guards (partly distribution activities included)
- Share of personnel on platforms, which is also covered in DSB's cost

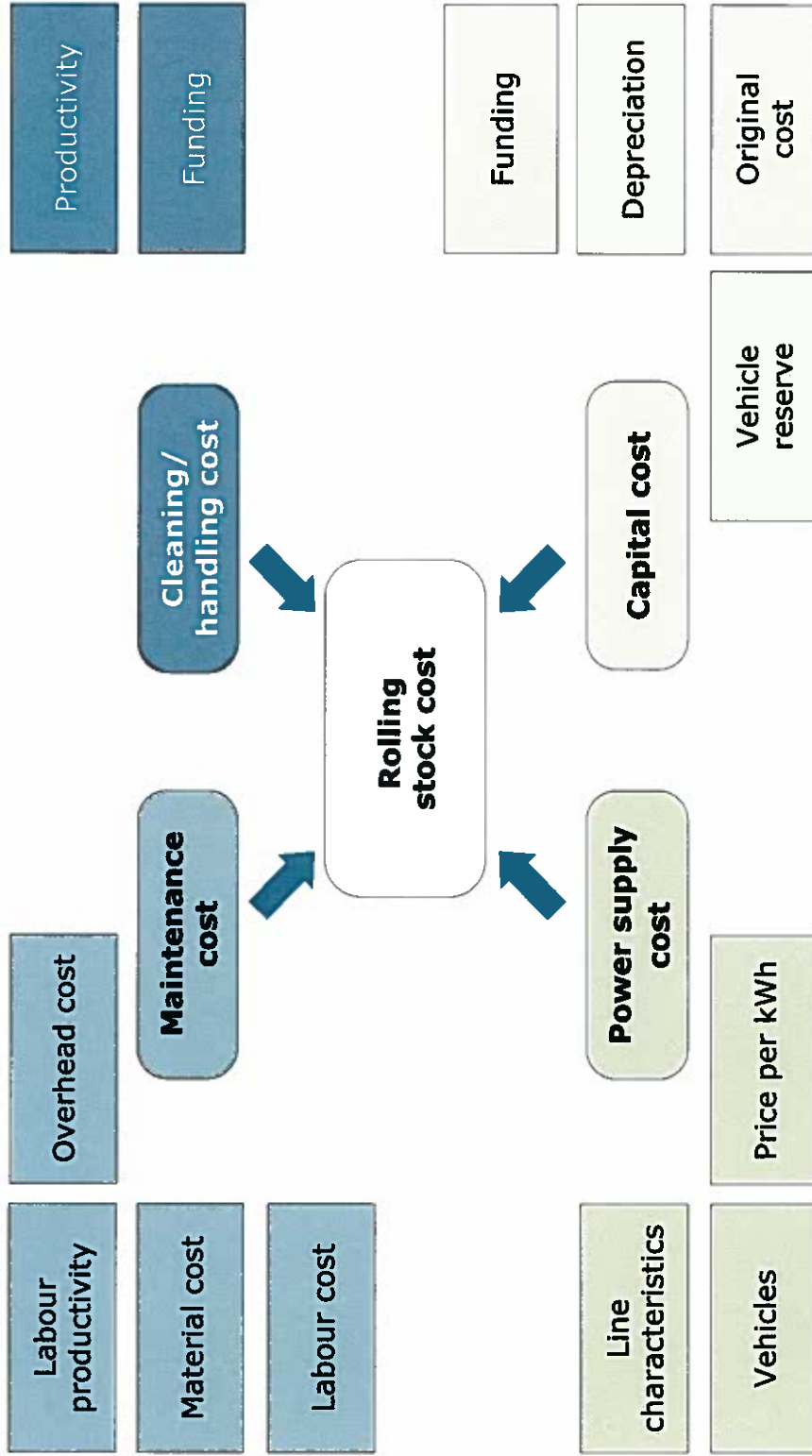
1) Benchmarks are normalised by PPP and DSB's travel speed, DSB IC, DSB Reg and DSB S-tog by DSB's travel speed

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The function "rolling stock" splits up into four sub-functions with several cost drivers

Cost-drivers of rolling stock cost

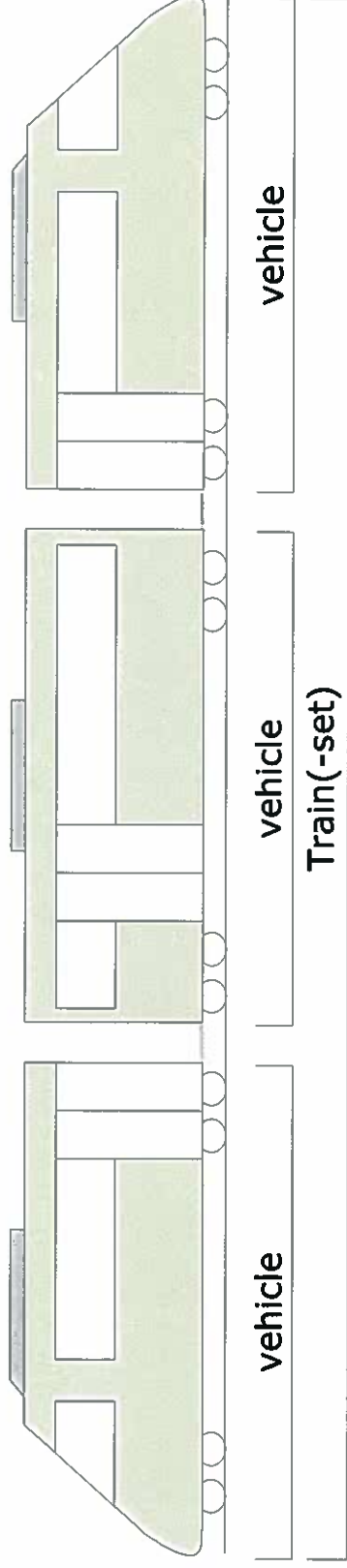


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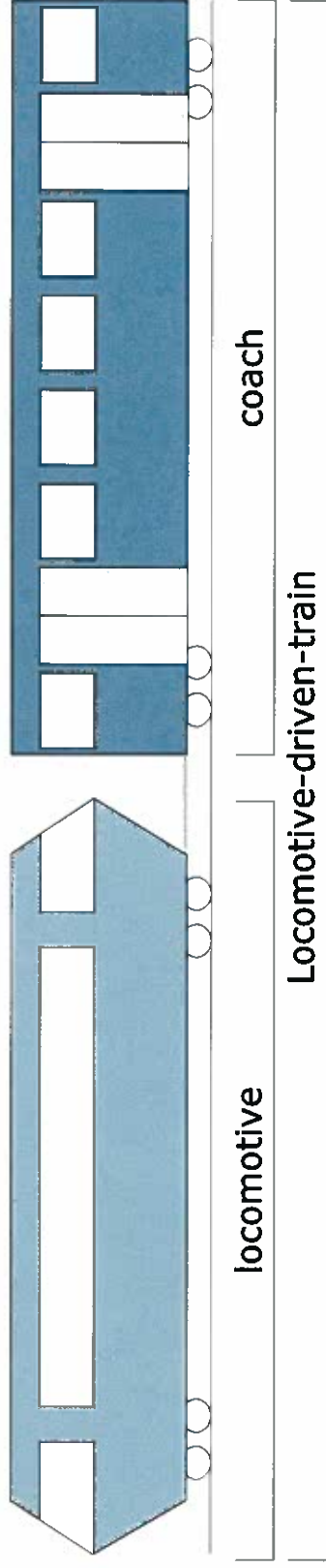
The analysis of the rolling stock rests upon clearly defined terms regarding the vehicle type

Definitions of rolling stock

EMU/DMU (DSB's Intercity partly regional trains and S-tog)



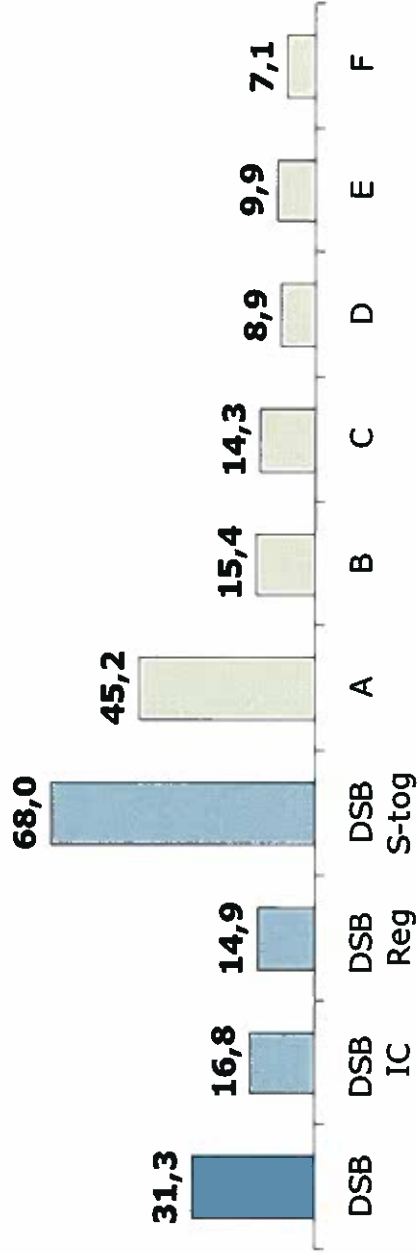
Locomotive-driven-train (Partly DSB's regional trains)



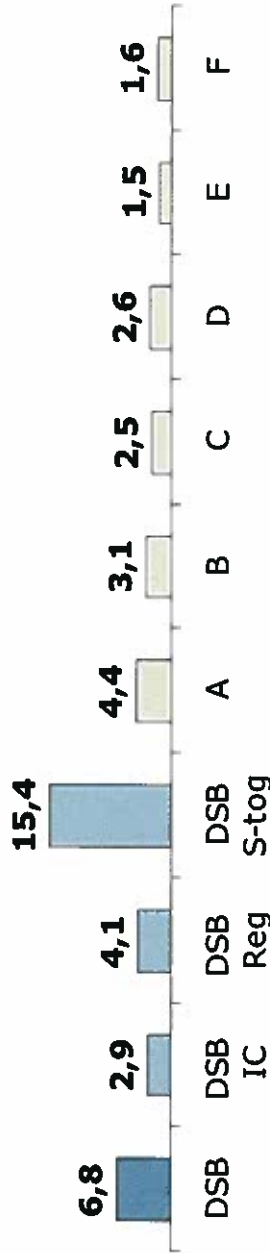
Due to the different accounting standards and partly written off vehicles the comparison of capital cost is to handle with care

Not normalised rolling stock capital cost

[DKK/train km]



[DKK/vehicle km]

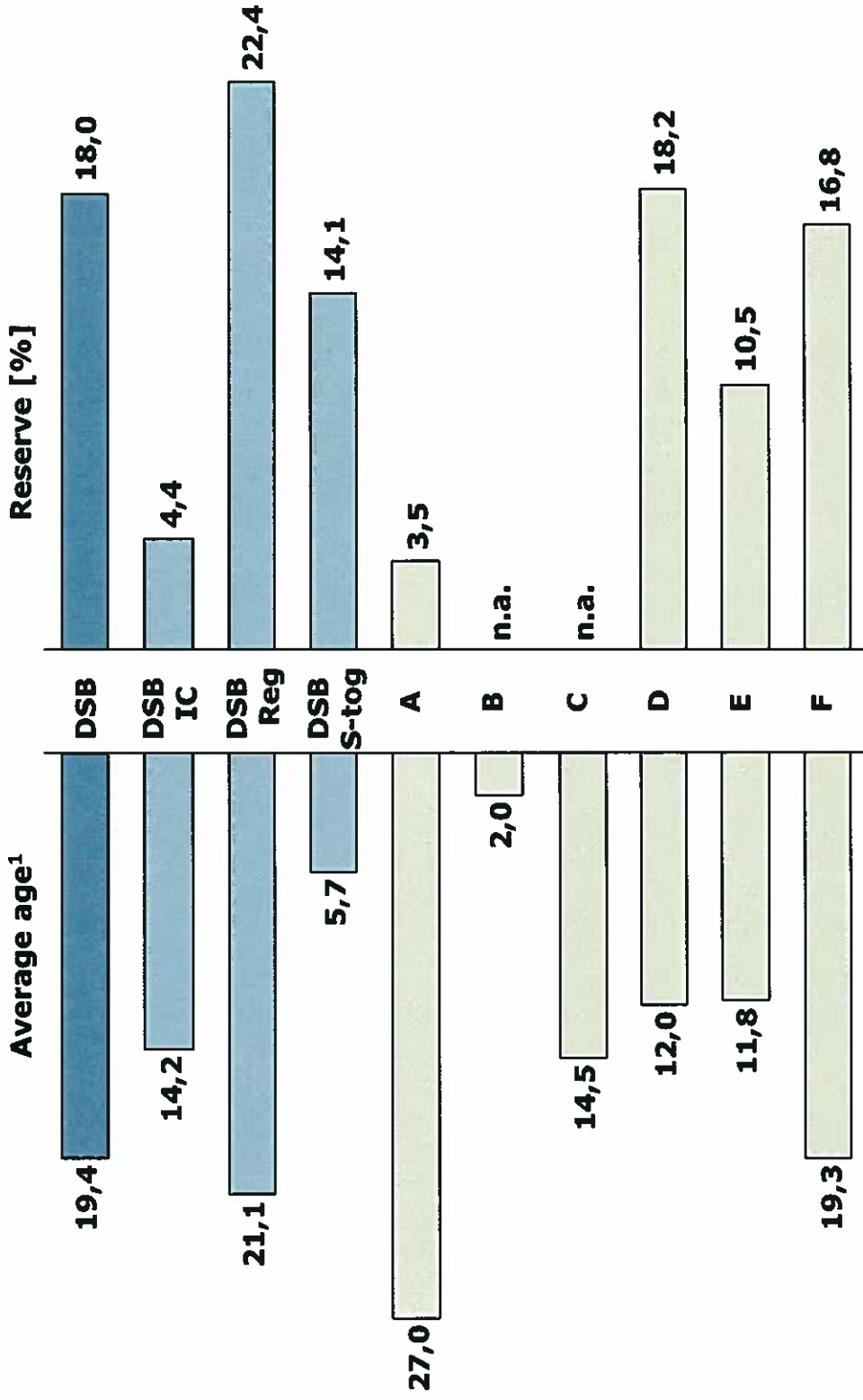


Cost share: 25,2%

Cost drivers:

- Accounting standards
- Average amortisation period
- Different consideration of interest
- Partly written off rolling stock

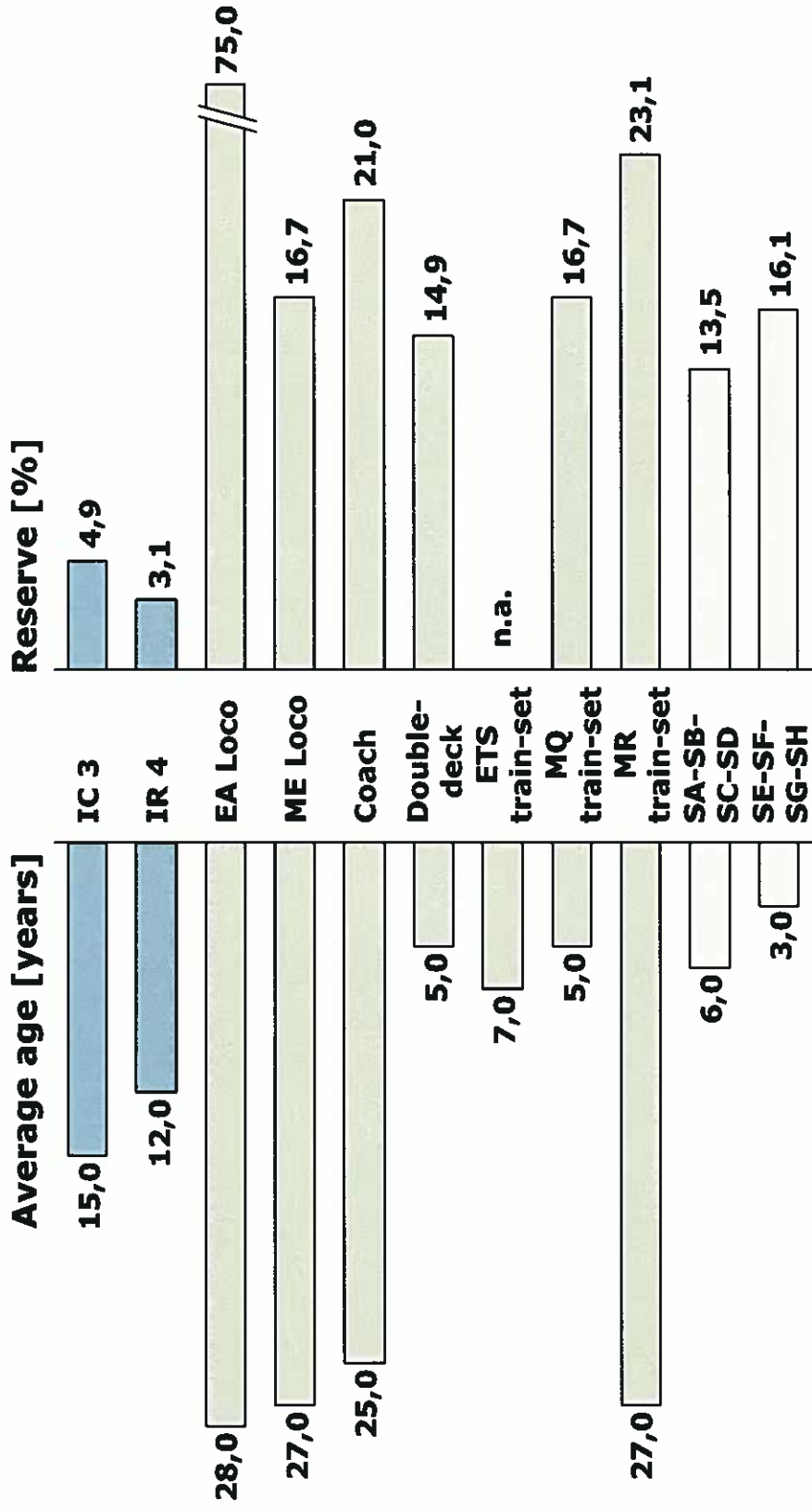
The vehicle capital cost is - among others - influenced by the vehicle age and reserve



1) Party redesigned in its lifetime

The regional rolling stock has a high share in older vehicle types; the S-tog uses nearly new vehicles

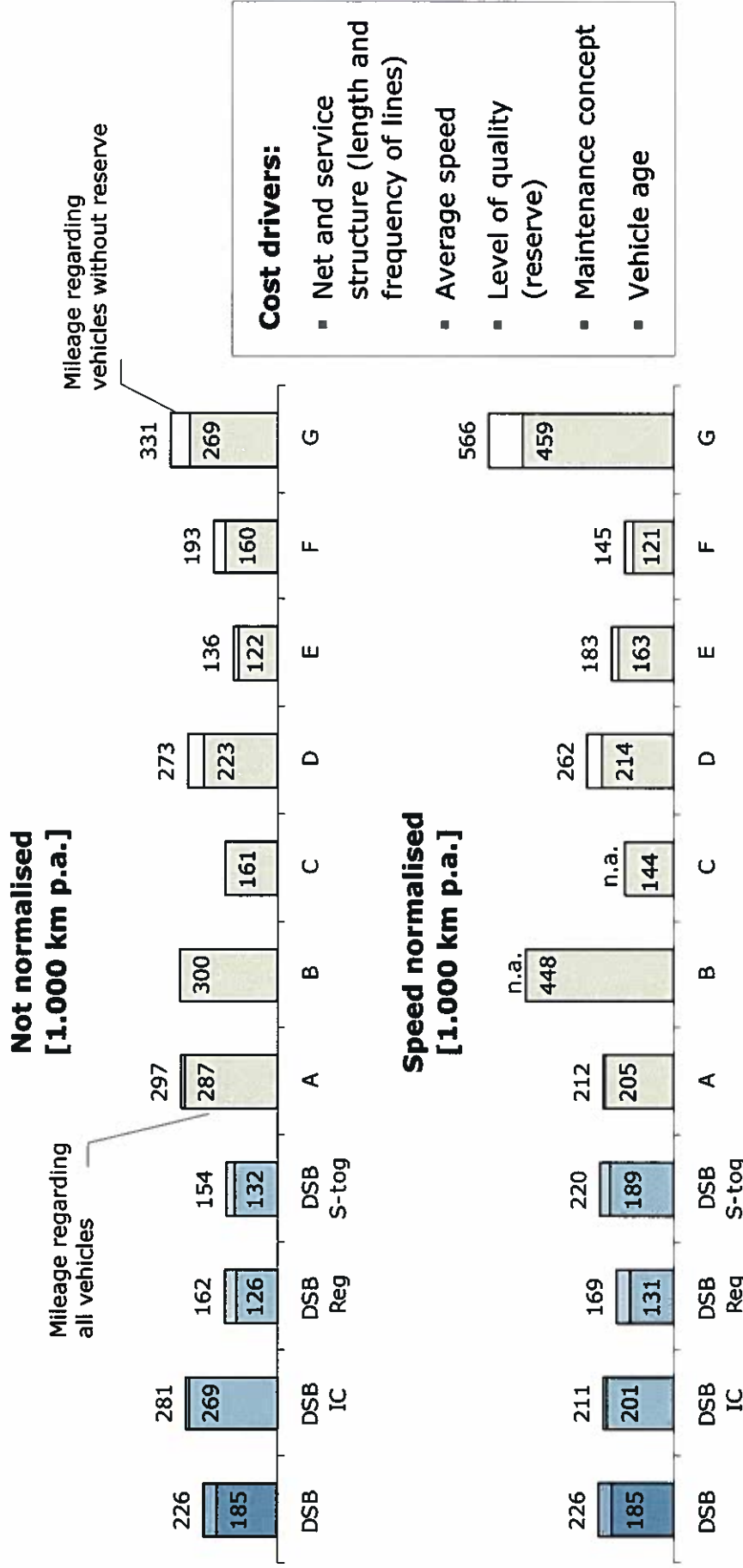
DSB's vehicle age and reserve



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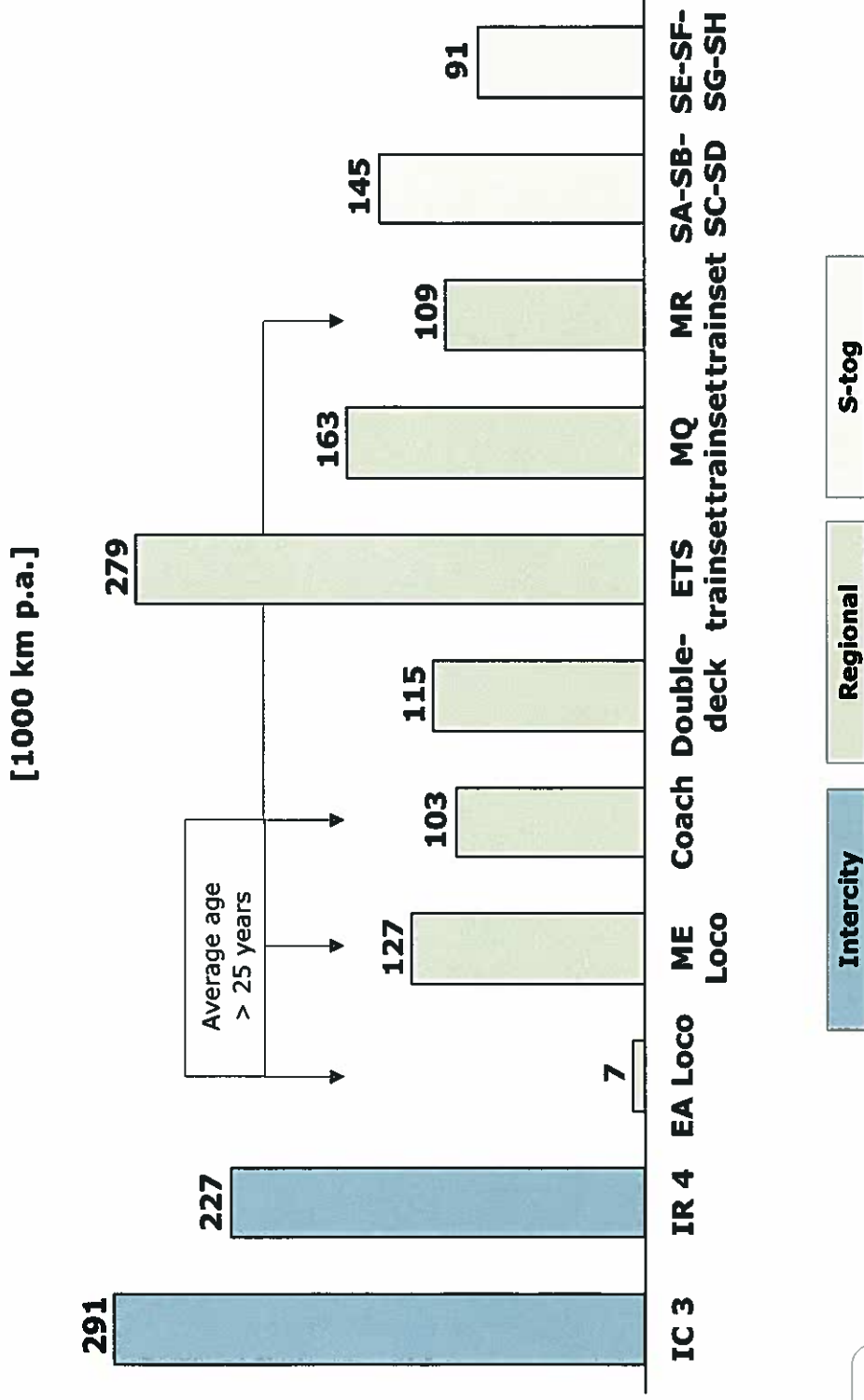
Average vehicle km of the DSB's Intercity is on a high level, while the mileage of the regional and S-tog is rather low

Average vehicle mileage



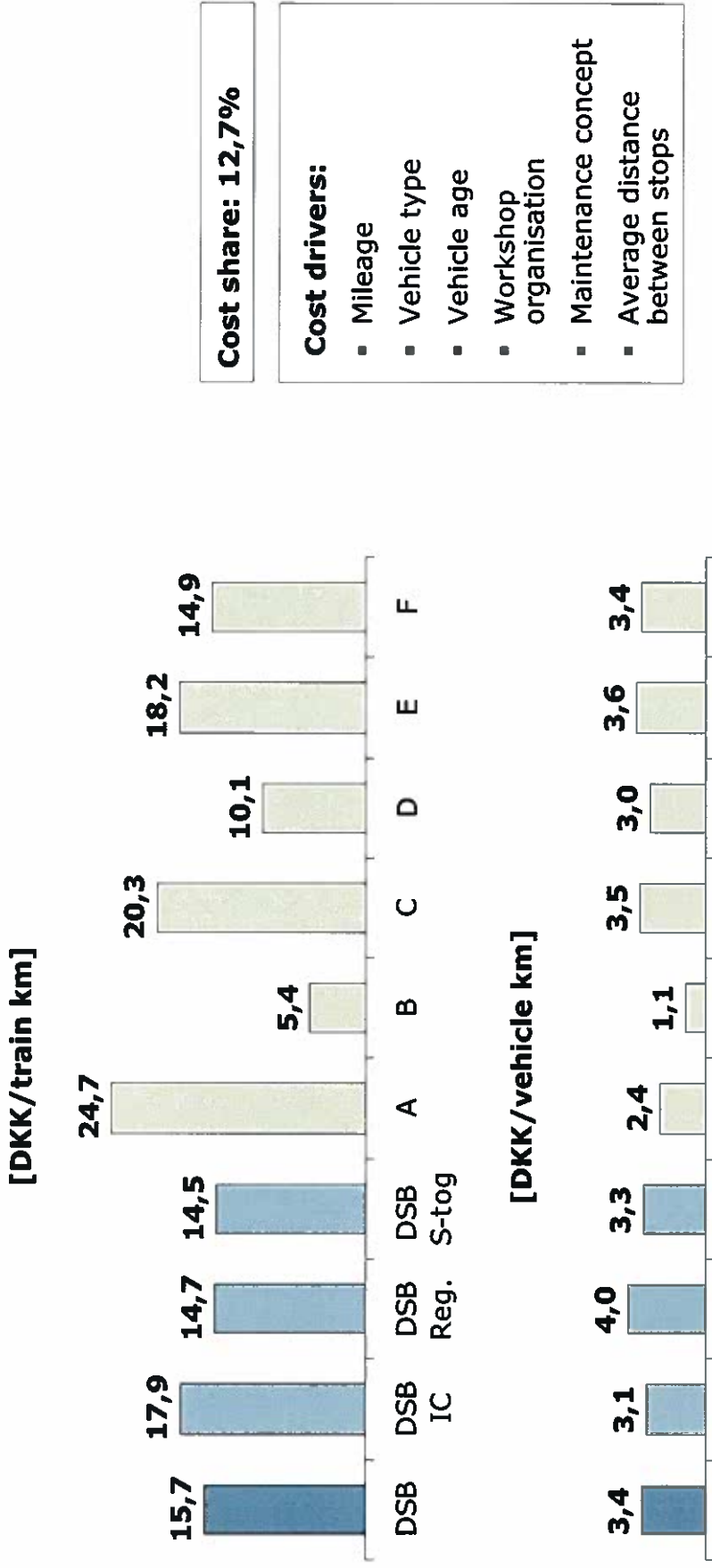
DSB's rolling stock utilisation – especially in regional service – strongly depends on the age of the vehicle fleet

DSB's average vehicle mileage



Maintenance cost of DSB are on average of the sample but per vehicle km slightly higher than best-practice

Normalised rolling stock maintenance cost

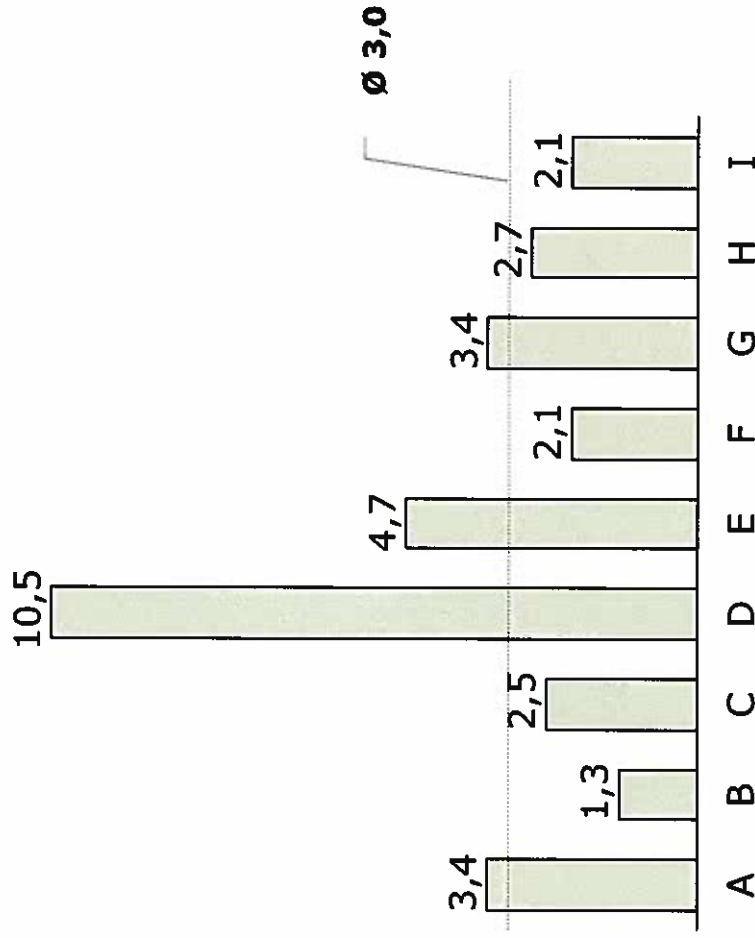


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An overall comparison between electrical and Diesel train-sets shows maintenance cost advantages of the electrical trains

Comparison¹ of normalised maintenance cost

Normalised EMU²-maintenance cost [DKK/vehicle km]



Normalised DMU³-maintenance cost [DKK/vehicle km]

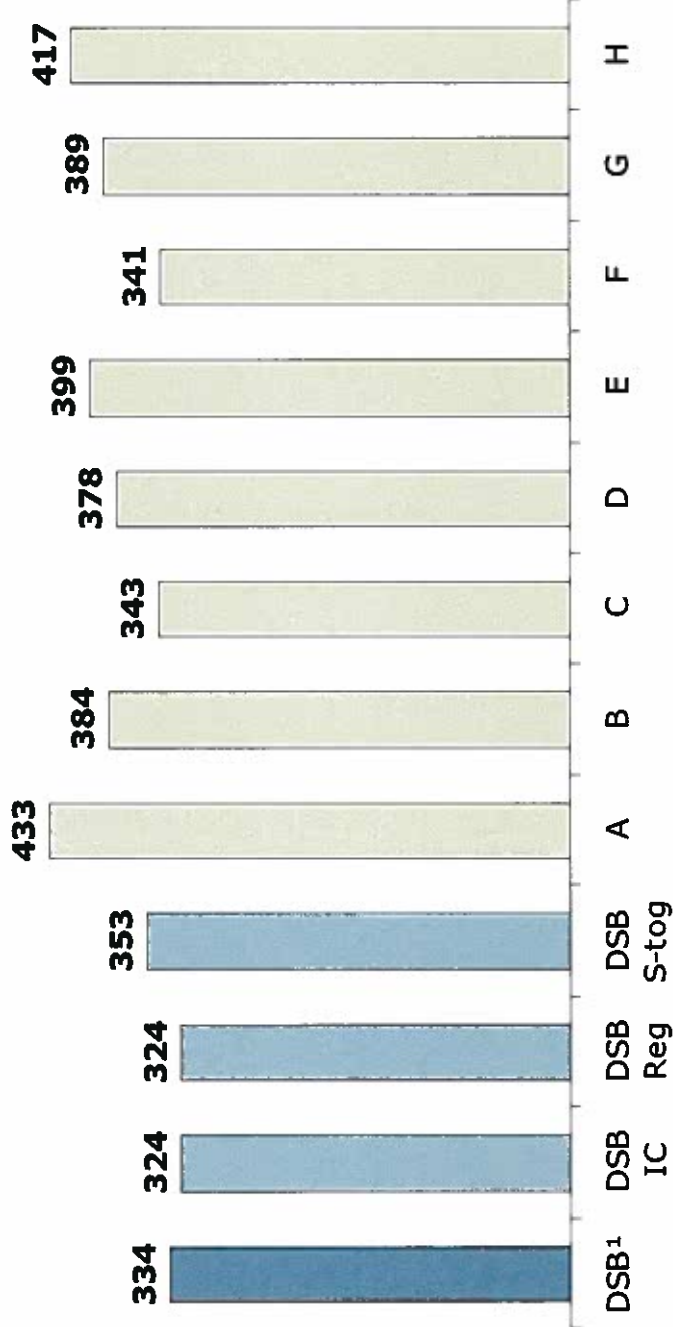


- 1) Without consideration of DSB, used characters are not comparable to page before
- 2) Electrical multiple unit
- 3) Diesel Multiple Unit

The spread of the normalised personnel cost of the mechanics is rather small and DSB's costs are lower than the benchmarks

Normalised personnel cost of mechanics

[1.000 DKK/mechanic]



Remarks:

- DSB's cost are 10%-15% lower than the average of the benchmarks
- The productivity of the mechanics should be analysed as well

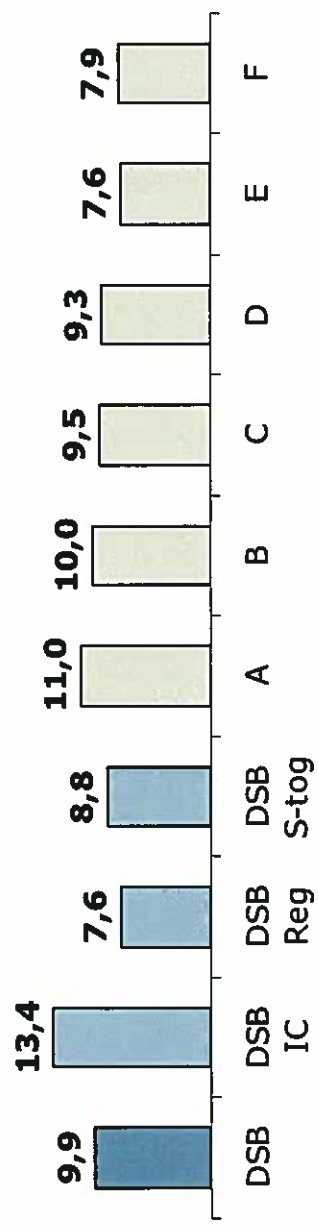
DSB's average personnel cost of mechanics are about 25% lower than the average personnel cost of train drivers

1) Average staff cost of all DSB's services InterCity and regional figures were calculated by BCG Detailed data have not been provided yet

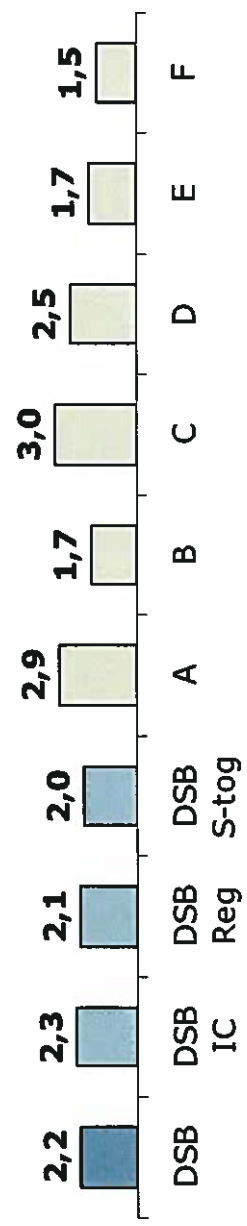
A first basic analysis of DSB's workshop productivity indicates an average productivity level

Workshop productivity

[Number mechanics/Mio train km]



[Number mechanics/Mio vehicle km]



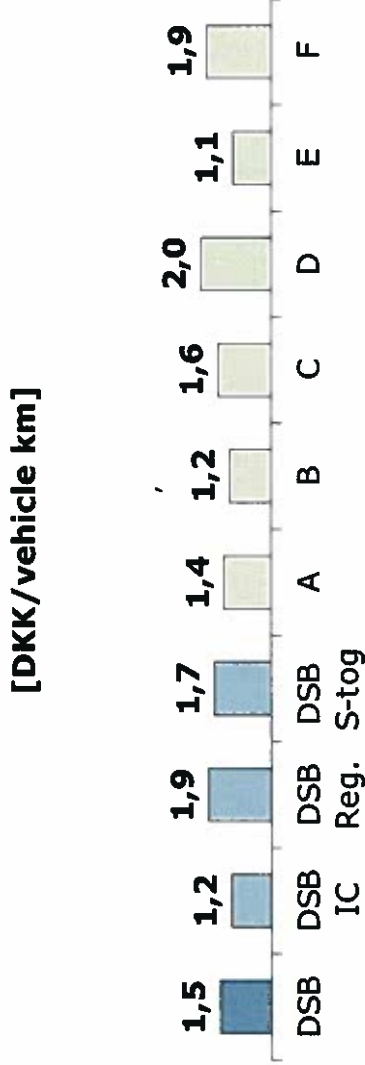
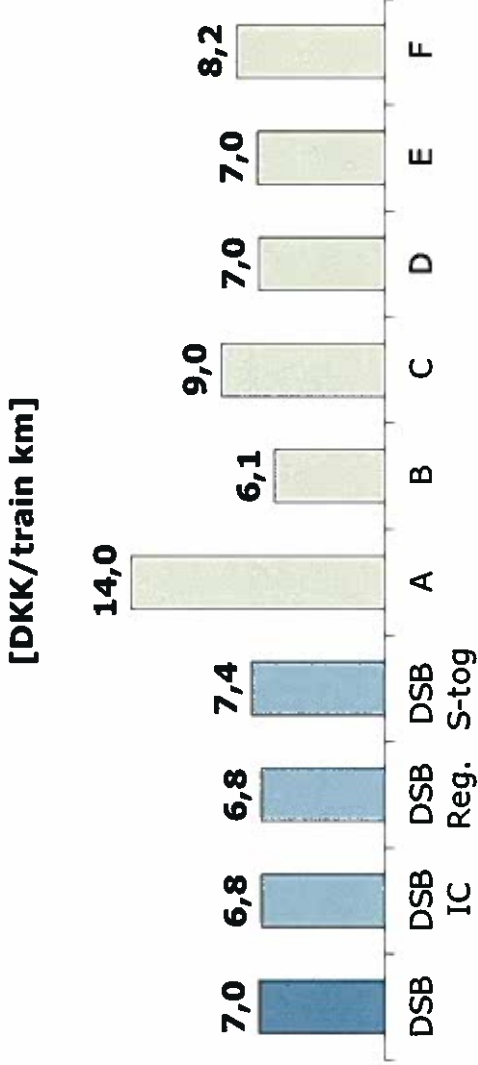
Remarks:

- The split up of DSB's direct maintenance cost reveals the following comparably low shares of personnel cost
 - IC: 36%
 - Regional: 22%
- In general, personnel cost share is between 40% - 60%
- Therefore, DSB's material cost seems to be very high
- Split up of DSB's fixed (indirect) maintenance cost is not available

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Not normalised, the energy costs of the DSB are on the average of the benchmarks

Not normalised power supply cost



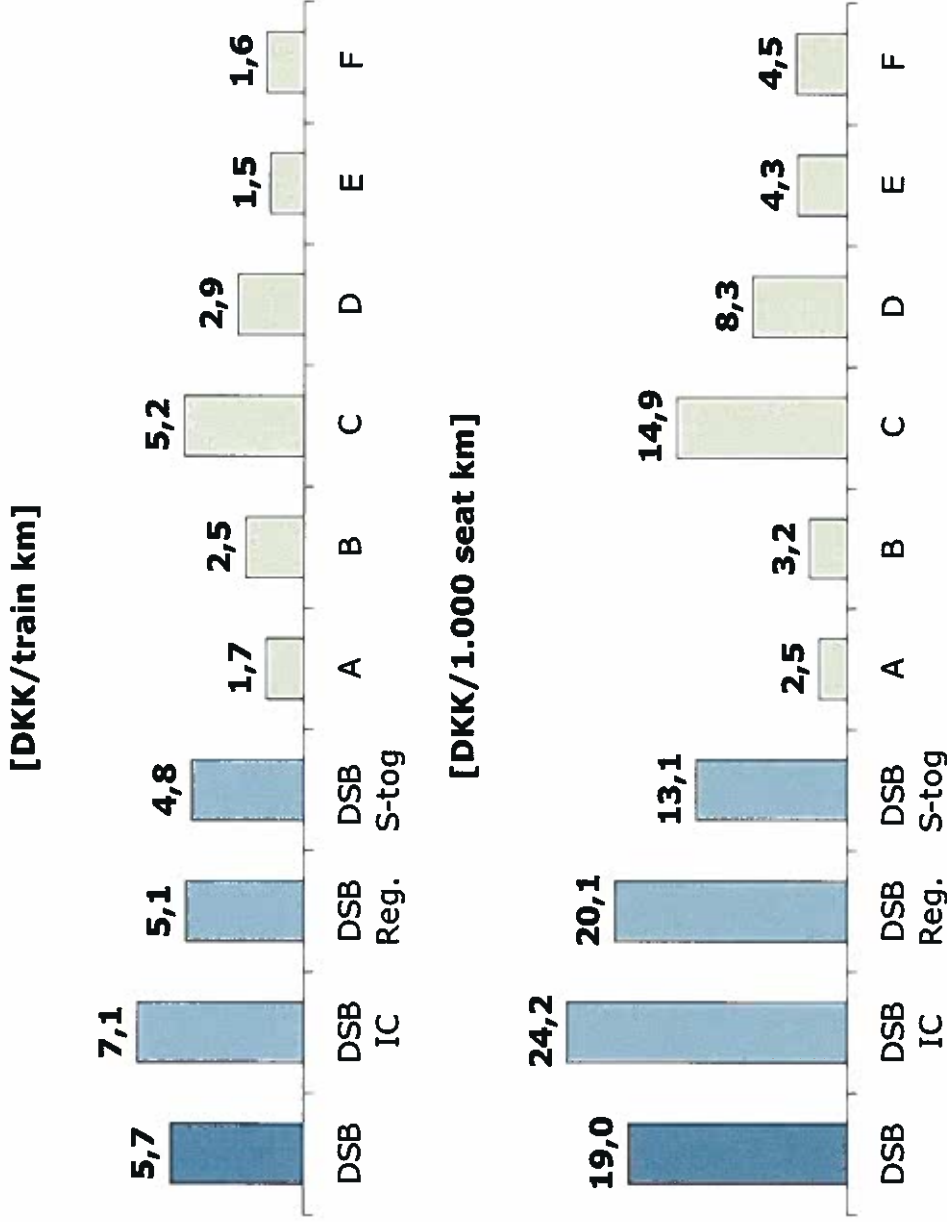
Cost share: 5,6%

Remarks:

- National tax regime
- Local price level
- Consumption (technical related)
- Driving behaviour
- Type of vehicles

The cleaning cost of DSB are considerably higher than the average of the benchmarks

Normalised rolling stock cleaning cost



Cost share: 4,6%

- Remarks:**
- Cleaning concept (e.g. subcontractor)
 - Vehicle type
 - Cleaning frequency
 - Requirements of authorities/service agreement

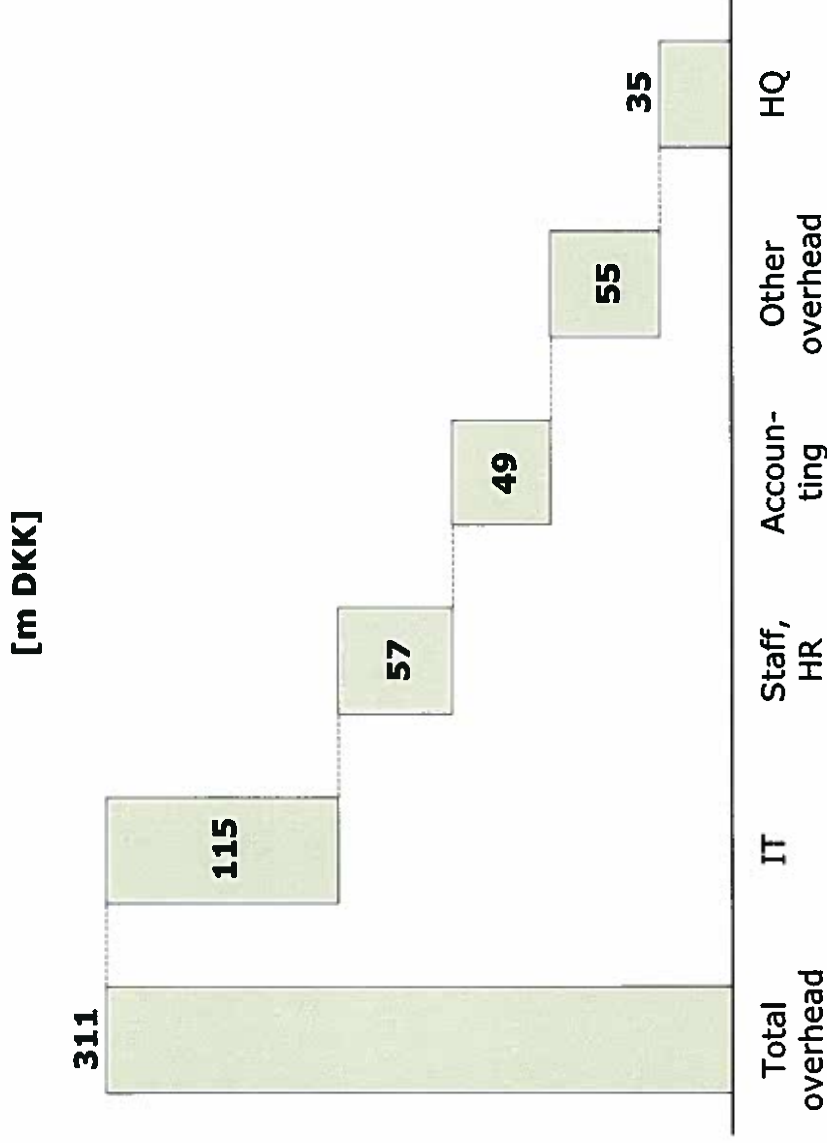
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Agenda

- Introduction
- Methodology
- **Results**
 - General
 - Train drivers/train guards
 - Rolling stock
 - **Administration**
 - Other

IT-costs account for more than a third of DSB's total overhead costs

DSB's overhead cost structure for InterCity and regional



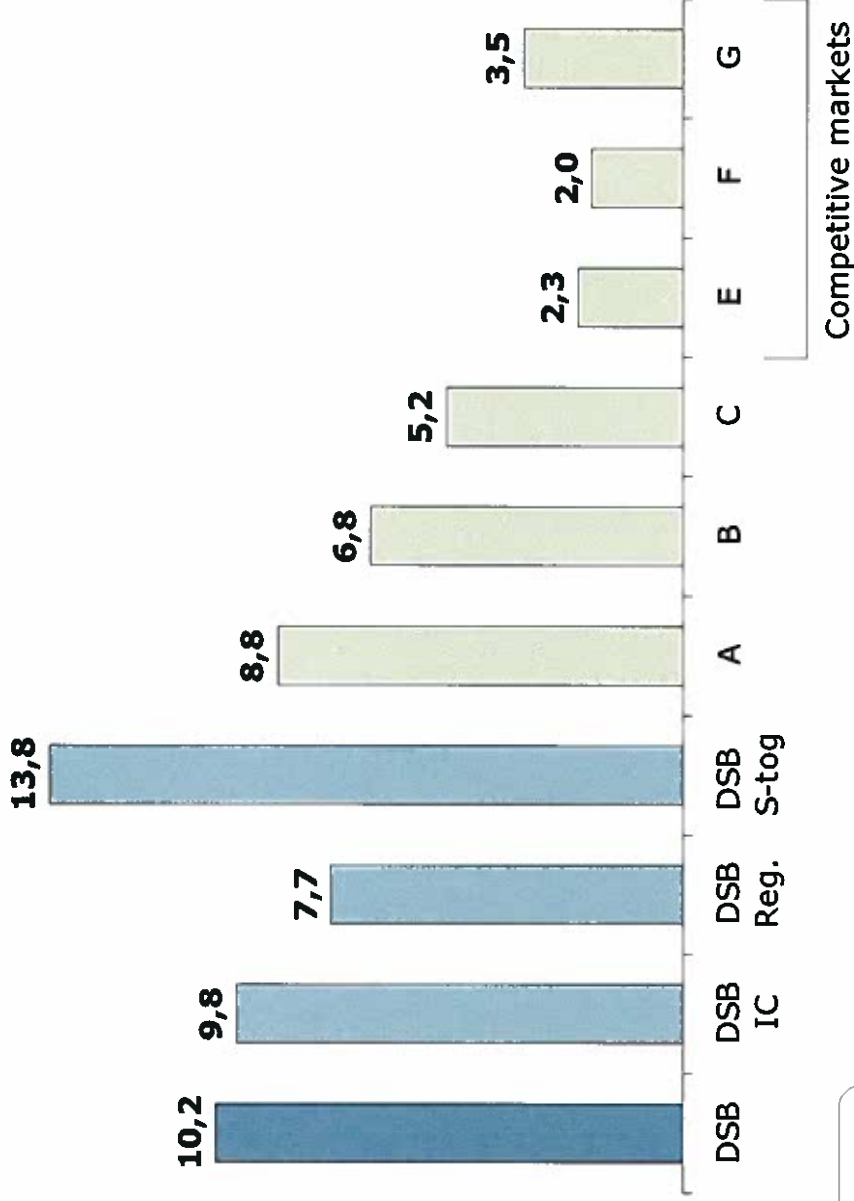
Remarks:

- Overhead covers typical functions of administration
- Not covered are specific train service overhead, e.g. operational management

Companies in competition often have about 50-80% lower overhead costs

Normalised overhead costs

[DKK/train km]



Cost share: 8,2%

Cost drivers:

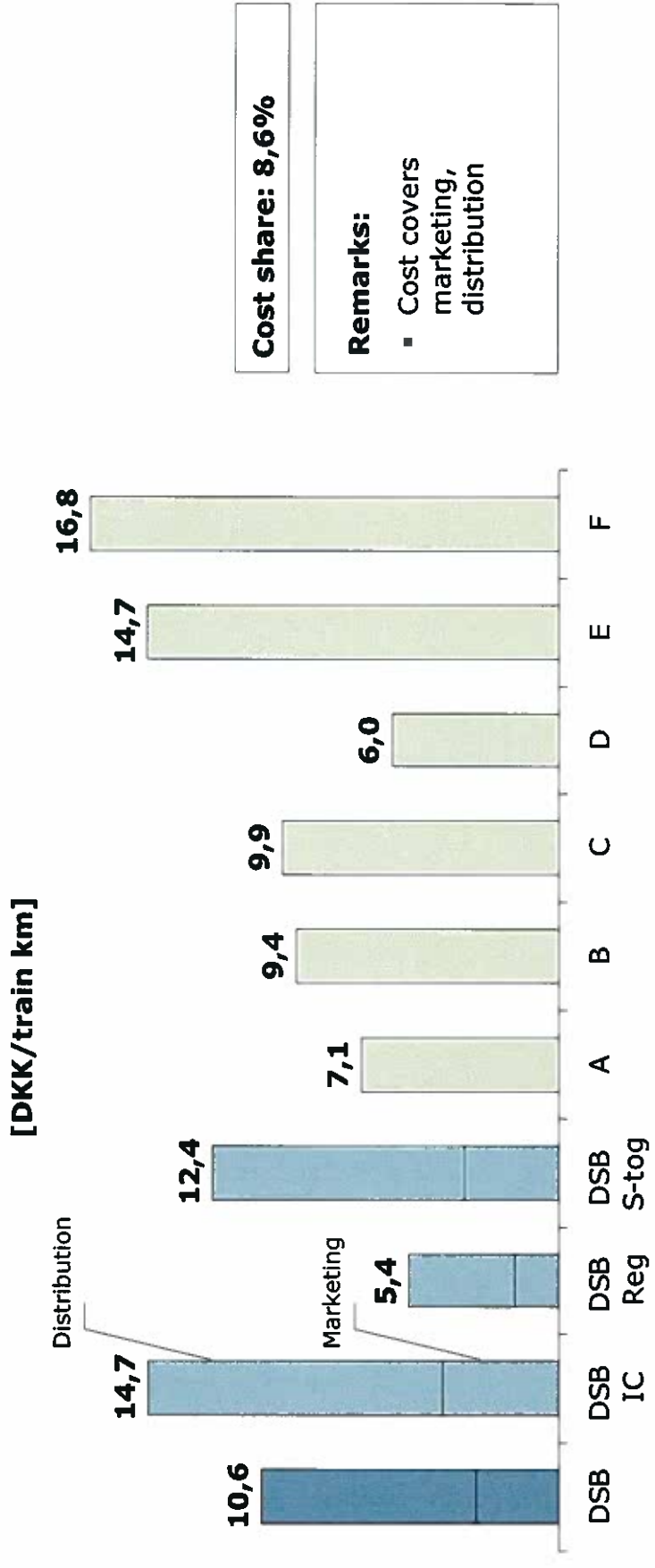
- Scope of functions (e.g. canteen)
- Personnel cost of administration staff
- Productivity (fte per employee)
- Span of control

Agenda

- Introduction
- Methodology
- **Results**
 - General
 - Train drivers/train guards
 - Rolling stock
 - Administration
 - **Other**

Due to a fix distribution cost share of the fares the marketing and distribution costs of DSB's services differ strongly

Normalised marketing and distribution cost



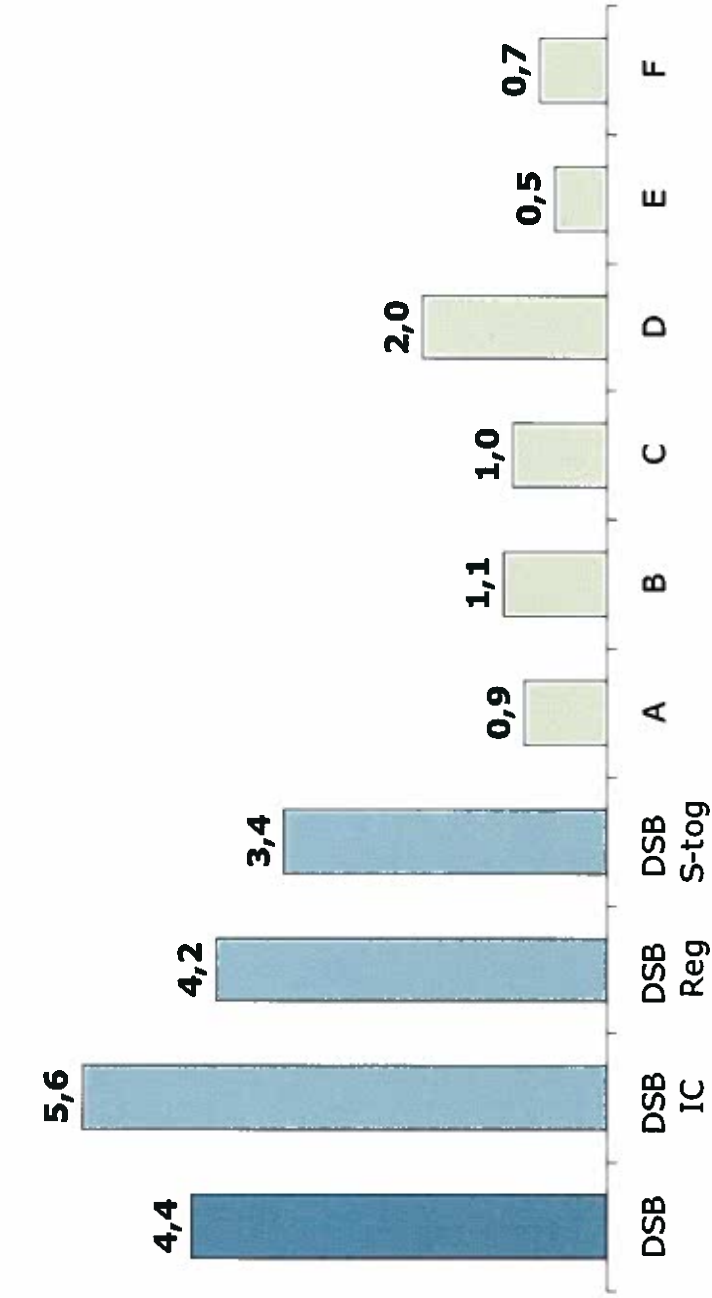
Due to very different service levels and requirements the benchmarking in this function is only a guideline

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DSB's cost of traffic management are much higher than the benchmarks – but cost share of total costs is only about 4%

Normalised cost of traffic management

[DKK/train km]



Cost share: 3,6%

Remarks:

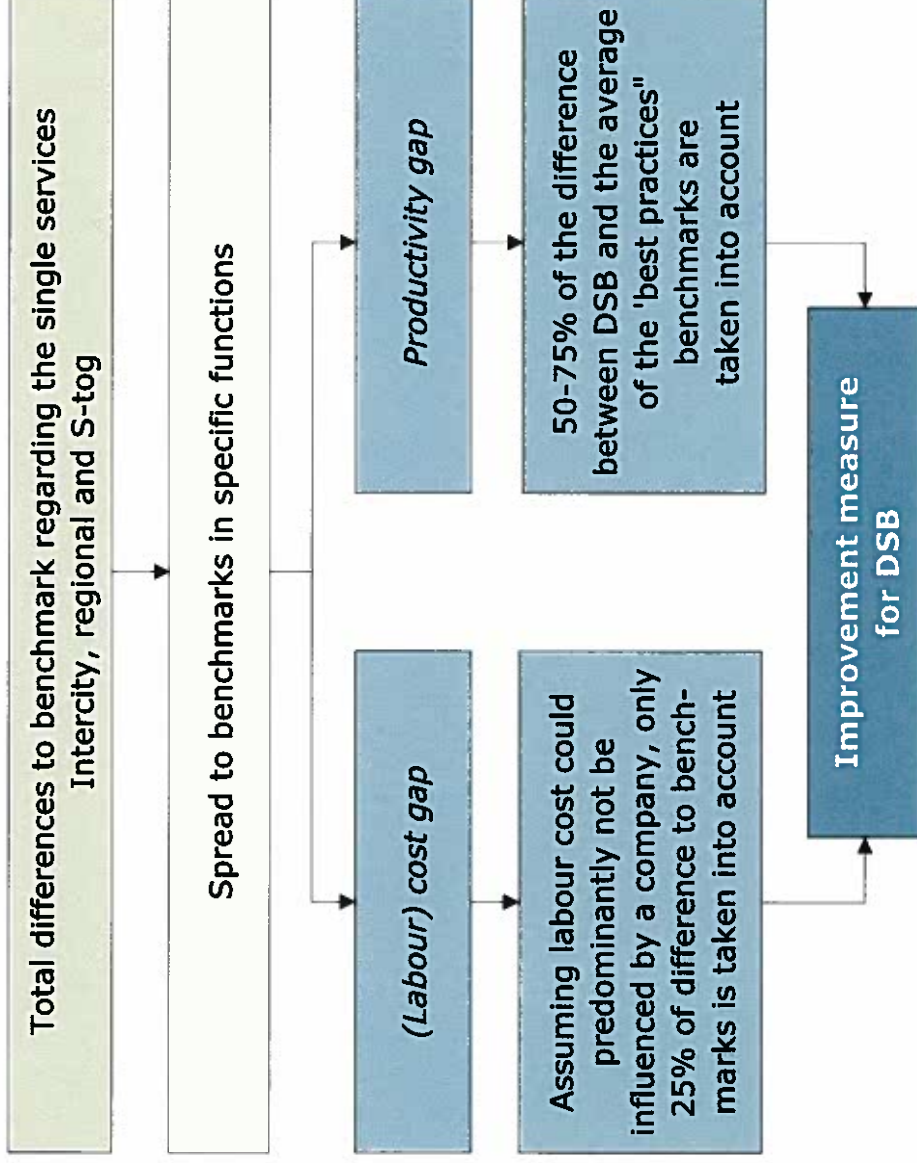
- Traffic management covers duty roster planning, vehicle and personnel disposition and operational administration

Agenda

- Introduction
- Methodology
- Results
- **Summary**

Based on the analysis of single functions, a total improvement for DSB can be recommended

Scheme of improvement measures



There is a cost-difference between DSB IC and benchmarks (which are not yet in competition) of more than 10% of total cost

Calculation of optimisation potential of DSB's IC service¹⁾

Function	Personnel cost potential	Productivity potential	Total potential	Remark
Administration/overhead	n.a.	Benchmarks have up to 15% lower costs	Up to 10%	Cost reduction based on not fully competitive markets
Marketing/distribution	n.a.	-	-	Probably potential, but cost-based optimisation not useful
Train drivers	-	DSB's productivity extremely low	Up to 25%	Detailed analysis of productivity gap required
Train guards	10% difference to benchmarks	Based on benchmark	Up to 15%	Due to different ratios of train guards per train to be verified
Fleet maintenance	-	Lump-sum based on benchmark	10%	Figures of personnel cost and number of employees required for further statement
Energy	-	-	-	Only consumption influenced by company
Fleet capital cost	-	Incalculable at present		Probably potential by reduction of vehicle reserve
Traffic management	n.a.	Benchmarks have up to 70% lower costs	Up to 50%	Sub-function to be analysed
Cleaning	n.a.	DSB's cost per seat km extremely high	Up to 55%	Detailed analysis of cost gap required
Infrastructure	n.a.	-	-	Infrastructure price not influenceable by DSB
Total			About 12%	Based on at present comparable functions

1) Based on available data, whereas personnel and detailed productivity figures often not available

The comparable functions of the regional service partly indicates a high cost reduction potential

Calculation of optimisation potential of DSB's regional service¹⁾

Function	Personnel cost potential	Productivity potential	Total potential	Remark
Administration/overhead	n.a.	Benchmarks have up to 50% lower costs	Up to 40%	Cost reduction in competitive market necessary
Marketing/distribution	n.a.	-	-	Small differences to benchmarks; cost-based optimisation not useful
Train drivers	20% difference to benchmarks	DSB's productivity extremely low	Up to 40%	Detailed analysis of productivity gap required
Train guards	10% difference to benchmarks	Lump-sum based on benchmark	Up to 10%	Due to different ratios of train guards per train to be verified
Fleet maintenance	-	Lump-sum based on benchmark	10%	Figures of personnel cost and number of employees required for further statement
Energy	-	-	-	Only consumption influenced by company
Fleet capital cost	-	Incalculable at present		Probably potential by reduction of vehicle reserve
Traffic management	n.a.	Benchmarks have up to 70% lower costs	Up to 50%	Sub-function to be analysed
Cleaning	n.a.	DSB's cost per seat km extremely high	Up to 65%	Detailed analysis of cost gap required
Infrastructure	n.a.	-	-	Infrastructure price not influenceable by DSB
Total			Up to 20%	Based on at present comparable functions

1) Based on available data, whereas personnel and productivity figures often not available

Source: BSL Management Consultants 75

The analysis reveals also several functions with a potential of optimisation for the S-tog services

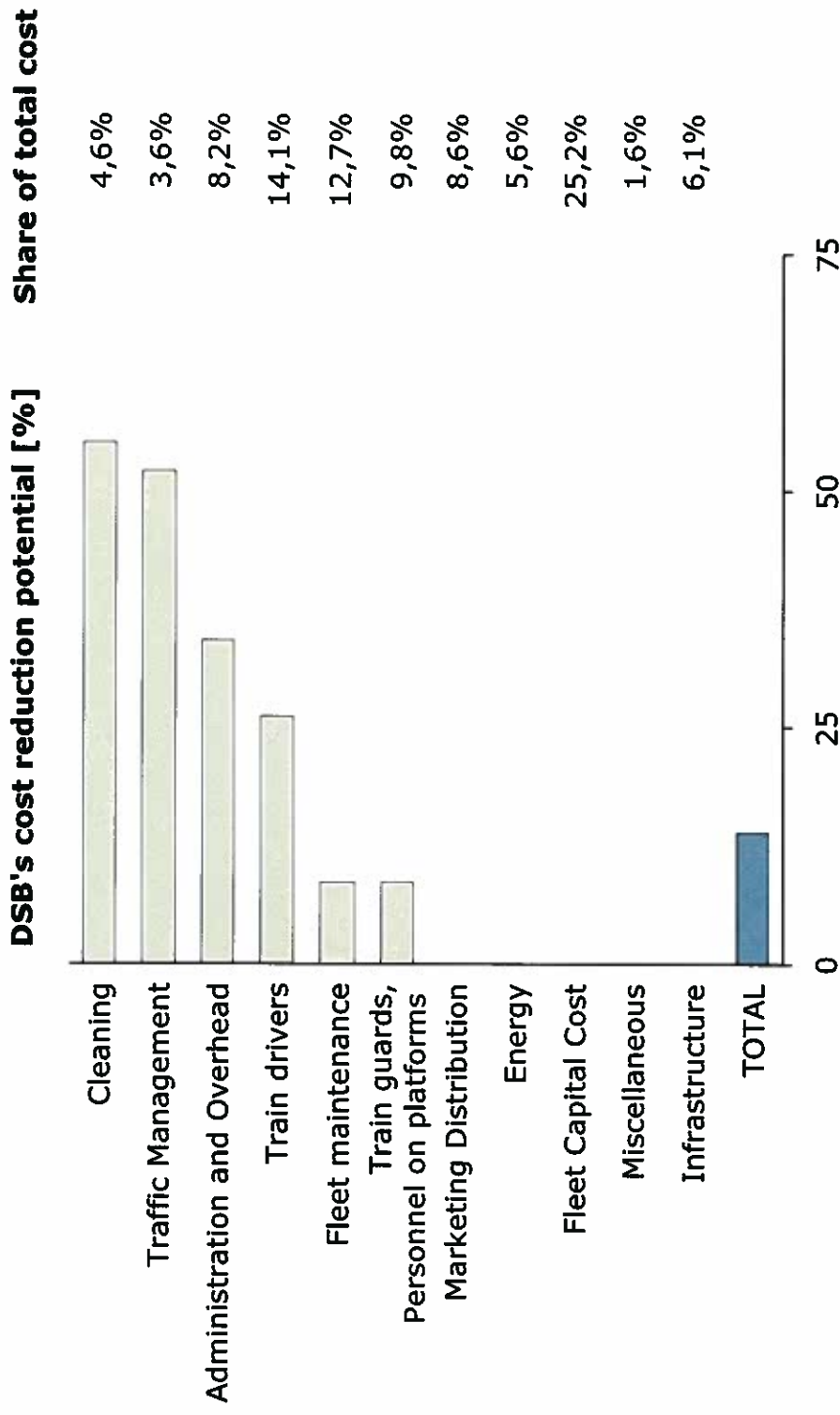
Calculation of optimisation potential of DSB's S-tog¹⁾

Function	Personnel cost potential	Productivity potential	Total potential	Remark
Administration /overhead	n.a.	Benchmarks have up to 70% lower costs	About 50%	Cost reduction in competitive market necessary
Marketing /distribution	n.a.	-	-	-
Train drivers	5% difference to benchmarks	DSB's productivity low	Up to 20%	Detailed analysis of productivity gap required
Train guards	-	-	-	-
Fleet maintenance	-	E.g. overhead-share seems to be quite high	5%	-
Energy	-	-	-	Only consumption influenced by company
Fleet capital cost	-	Incalculable at present		Probably potential by reduction of vehicle reserve
Traffic management	n.a.	Benchmarks have up to 60% lower costs	Up to 45%	Sub-function to be analysed
Cleaning	n.a.	High cost per seat km and high overhead-rate	Up to 50%	Detailed analysis of cost gap required
Infrastructure	n.a.	-	-	Infrastructure price not influenceable by DSB
Total			About 10%	Based on available data

1) Based on available data, whereas personnel and productivity figures often not available

Compared to other European operators DSB has high cost reduction potentials for a couple of functions

DSB's cost position



This cost potential analysis is a first assessment that has to be verified and supplemented

Source: BSL Management Consultants 77

Best practice cost for DSB's functions are long term very ambitious targets

DSB's target cost II

[DKK/train km]	Best practice cost		
	IC	Reg	S-tog
Cleaning	3,0	1,6	1,6
Traffic Management	2,0	1,0	1,5
Administration and Overhead	8,0	3,5	5,0
Train drivers	9,5	5,5	7,5
Fleet maintenance	15,5	10,5	12,0
Train guards, Perso. on plat.	13,0	5,0	4,4
Marketing Distribution	14,7	5,4	12,4
Energy	6,8	6,8	7,4
Fleet Capital Cost	16,8	14,9	68,0
Miscellaneous	2,5	0,3	3,3
Infrastructure	16,0	4,0	2,2
Total	107,9	58,5	125,3

Best practice cost are the average of a sample of best practice benchmark companies regarding the traffic types. Best practice based on cost per kilometre (train, vehicle, seat) and/or productivities

To develop extensive strategic actions further steps are necessary for the different functions

Proposal of further proceeding

Function	Next steps
Train driver	<ul style="list-style-type: none">▪ Further analysis of productivity and clarification of personnel utilisation
Fleet maintenance	<ul style="list-style-type: none">▪ Further analysis of productivity and material cost▪ Differentiation in vehicle specification
Platform pers. & Train guards	<ul style="list-style-type: none">▪ Separation of train guards and platform personnel
Administration & Overhead	<ul style="list-style-type: none">▪ Consideration of function scope and specific costs
Traffic management	<ul style="list-style-type: none">▪ Cost differentiation and benchmarking for single sub-functions
Cleaning	<ul style="list-style-type: none">▪ Verification of cleaning concept and analysis of cost drivers

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