

A multi-track future

**An analysis of the social and environmental aspects of
railways and public transport**

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Railways and public transport from the investor's perspective

Capital-intensive sector

The main focus of this business is the transportation of people and goods by rail and by other forms of public transport, such as bus or taxi. All the railway companies studied in this report, with the exception of rail operators in the UK and France, own their railway network. The maintenance and expansion of this infrastructure, along with the constant need for modernisation of the rolling stock, tends to be extremely capital-intensive.

Diversified business: railway stations, real estate and intermodal transportation

Companies in this sector earn their revenues not just from transportation, but also from rail-related services such as the operation and leasing of advertising space and shops inside railway stations, or managing real estate. In Japan, this latter activity accounts for as much as 40% of revenues. With freight transportation, the movement of goods from one mode of transport to another (intermodal) is becoming more important, and to do this a company must have its own services and a suitable infrastructure.

Rail and public transport companies analysed in the report, by region (selection corresponds to 85% of the MSCI World Railroads)

Company	Country	Stock market capitalisation EUR m	Total revenues EUR m	As % of revenues			Workforce	Transport performance	
				Passengers %	Goods %	Bus, Taxi, Others %		Passenger km Billion	Tonnes km
East Japan Railway	JP	21'439	16'346	70		30	63'897	126	
Central Japan Railway	JP	18'482	7'564	95		5	15'422	49	
West Japan Railway	JP	6'983	7'820	60		40	43'093	53	
Deutsche Bahn*	DE	no data	25'055	45	50	5	216'389	72	77
SNCF*	FR	no data	20'994	50	30	20	238'000	76	41
Danske Statsbaner*	DK	no data	9'407	90		10	9'078	57	
FirstGroup	GB	3'247	4'528	39		61	67'367	42 (UK overall)	
National Express	GB	2'355	3'461	68		32	40'117		
Stagecoach	GB	2'305	2'343	29		71	29'657		
Arriva	GB	2'064	2'430	15		85	32'420		
Go-Ahead**	GB	854	1'951	47		53	20'069		
MTR	HK	10'411	895	69		31	6'513	no data	
Comfordelgro	SG	1'610	1'123	3		97	19'212	no data	
SMRT	SG	853	334	55		45	5'715	no data	
Burlington Northern Santa Fe	US	20'923	9'914		100		40'000		370
Canadian National Railway	CA	19'085	4'736		100		22'246		208
Union Pacific	US	18'585	10'365		100		49'747		341
Norfolk Southern	US	15'591	6'509		100		30'294		126
CSX	US	12'132	6'579		100		35'000		154
Canadian Pacific Railway	CA	6'742	2'873		100		16'448		147
Kansas City Southern**	US	1'944	1'032		100		3'060		16

* unlisted ** listed but not in MSCI

Source: MSCI, companies, data mainly refer to 2005

Only a small number privatised ...

Only a small percentage of the world's public transport companies operate as private firms. An analysis of listed transport companies therefore conveys only a

**... and all are still heavily
regulated by the government**

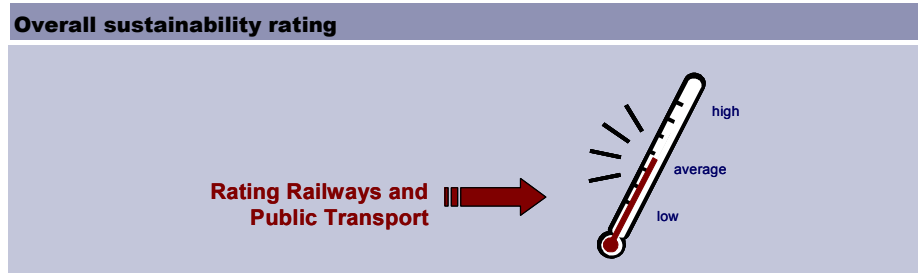
very fragmented picture of the industry as a whole. The wave of deregulation that began back in 1980 was led by the US, Canada, the UK, Japan and Australia. Some European countries, including Germany and Denmark, plan to privatise their state-owned monopolies by 2010.

In many areas, the industry is governed by strict state regulations, for example regarding the quality of transport services (punctuality, frequency), the preservation and expansion of less populous regional routes, and safety. The authorities in question compile data which are publicly accessible in most cases.

Sustainability risks of the industry

Transportation: environmental risks are a major concern

Railways and public transport are the linchpin of a modern, prospering economy and make an important contribution to regional development. At the same time, carrying passengers and goods consumes energy and generates greenhouse gases and other emissions. Transport sectors thus essentially present higher environmental risks than more service-oriented industries.



Source: Bank Sarasin

Differences between rail, air and road

When it comes to environmental risks, however, there are significant differences between individual modes of transport. An analysis of sustainability risks gives rail transport a much better rating than road freight (lowest rating, i.e. highest risks) and air travel (below-average rating). Rail transport has an average rating when it comes to environmental and social risks, mainly thanks to its higher energy efficiency and superior emissions profile, coupled with very low accident rates and working conditions that are still relatively good.

Sustainability rating of transport sectors in detail: diverse risk profile – especially when it comes to environmental risks

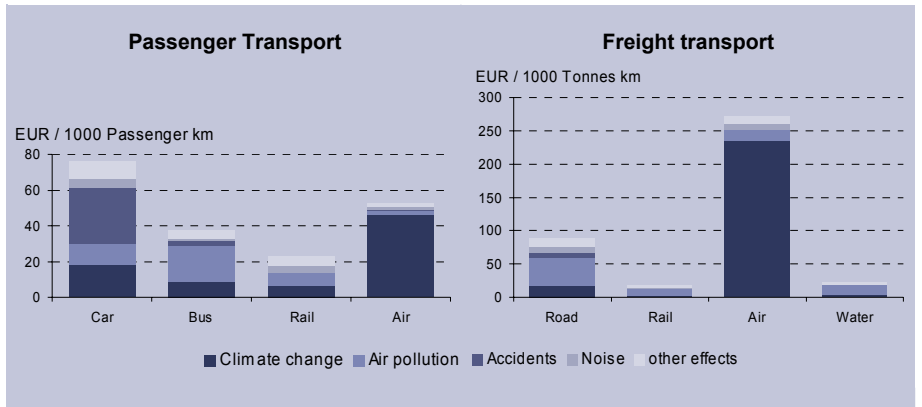
Risks:	Rail and Public Transport	Air Travel (Persons & Goods)	Road Freight
Consumption of resources	●●	●●●●●	●●●●
Emissions	●●●	●●●	●●●●●
Internal conflict potential	●	●	●●
External conflict potential	●	●	●●

Source: Bank Sarasin

External costs of transport as a measure of risk

One of the things we considered when assessing the risks was the external costs of transport. The bill for transportation costs, which society picks up, was first calculated almost 10 years ago. According to recent estimates, these costs now total roughly 7% of GDP in Western Europe. The most important risk areas where the originator – i.e. the companies in the industry in question – does not yet cover the costs include: climate impacts (30%), harmful air pollutants such as particulates (approx. 25%), accidents (roughly 25%) and noise (7%).

External costs in passenger and goods transport: rail, bus and shipping have a much greener profile



Source: INFRAS (data for 17 EU member states for the year 2000)

Rail transport: much lower external costs

Road transport generates around 80% of the total external costs, followed by air transport at roughly 15%. Air transport incurs particularly high external costs when shipping goods. In absolute terms, however, only a relatively small percentage of the world's total goods tonnage is currently transported by air. Transport by rail and water incurs much lower external costs than transport by road and air – both in the movement of passengers and goods.

Redundancies and restructuring: change of trend imminent

In many countries, the railways are major work providers. Since the mid-80s, however, the level of employment in the industry has steadily dropped worldwide. In Europe, it was not unusual for workforces to be slashed by as much as thirty to forty percent during the period 1990-2000, mainly due to ongoing deregulation and privatisation, shrinking market shares and productivity improvements made possible by technology. In Europe, we have seen signs of a slight reversal of this trend since 2001. This extends across the entire sector. In the case of former state monopolies in which the government still holds a major stake, however, ongoing deregulation is likely to lead to further job cuts.

Strong trade unions, good conditions of employment

Railway companies still offer relatively good working conditions. This has to do with their high level of trade union organisation, well-defined terms of employment (even in the US) and their traditional close ties with the state over the past decades. When job cuts are necessary in the industry, they are generally made in a socially acceptable way.

Good safety record and some noise problems

Accidents and noise are other social risks which the transport industry has to contend with. Once again, rail transport has a better track record than other modes of transport in some areas. In the EU, for example, the rate of fatal road accidents is 100,000 people per billion person kilometres, compared with 0.5 deaths on the railways. Noise is especially a problem in freight transportation using older vehicles or rolling stock, and with travel at night. This applies to both road and rail.

Financially relevant opportunities and risks for companies

Political climate favours sustainable transport carriers

Although transportation was initially hardly considered by policy makers, it has increasingly attracted criticism as the debate on climate change has become more animated. Pressure is increasing because of its significant environmental impact. The most prominent examples of initiatives in this area include extending the European system for emissions trading to include airlines, and imposing tougher CO₂ emission limits on vehicles. In built-up areas such as Asia's rapidly expanding mega cities, serious air pollution is encouraging the introduction of road pricing and tougher emission limits on vehicles. Directly or indirectly, these measures are gradually internalising the external costs of transport. These trends in transport policy, coupled with higher oil prices, give railways and other modes of public transport a competitive advantage.

Financial risks and opportunities associated with sustainability: railways and public transport		
Sustainability issues	Risks	Opportunities
Sustainable transport: Supported by trends in transport policies around the world	<ul style="list-style-type: none"> Very exposed to transport policy (size of infrastructure investments, financial framework for non-sustainable modes of transport) 	<ul style="list-style-type: none"> Competitive advantages through tougher rules on road transport or rail subsidy measures Higher oil prices: Competitive advantages vs. road transport, thanks to higher energy efficiency (esp. US freight trains)
Punctual, clean, value for money: Quality of offering as key competitive factor	<ul style="list-style-type: none"> Loss of clients through poor offering can usually only be rectified by large investments (rolling stock, more client-focused workforce) Collateral damage: Due to systemic nature of public transport, shortcomings of one provider (esp. a dominant ex-monopoly) have a negative impact on the whole sector 	<ul style="list-style-type: none"> Market share won through innovative offerings, continuous modernisation of means of transport, and good customer service Value added created by ensuring the offering meshes smoothly with other transport providers
Safety: Statistically safe, but terrorist acts and accidents have a high signal effect	<ul style="list-style-type: none"> Mid-term loss of customers through major accidents or terrorist acts affecting own or rivals' networks High costs and conditions imposed through systemic safety failures in services, workforce or infrastructure 	<ul style="list-style-type: none"> Statistics show a much lower accident rate than road transport (passengers and freight) Cost control through suitable and steady investments in safety management
Work relations: Restructuring as a potential source of conflict	<ul style="list-style-type: none"> Restructuring of former state companies usually means an erosion of good conditions of employment and increased risk of industrial unrest Strong degree of trade union organisation allows for combat tactics that can seriously damage transport services 	<ul style="list-style-type: none"> Established and well-maintained arbitration processes and socially responsible redundancy programmes reduce the risk of labour conflicts escalating
Air pollution and noise: Tougher legal requirements on the way	<ul style="list-style-type: none"> Investments needed to respond to stricter legal standards for air emissions and noise, or for putting these standards into practice 	<ul style="list-style-type: none"> In-house development activity for improving energy efficiency (Japan), continuous modernisation of rolling stock and a high degree of network electrification all help to reduce costs

Source: Bank Sarasin

Quality and efficiency are crucial ...

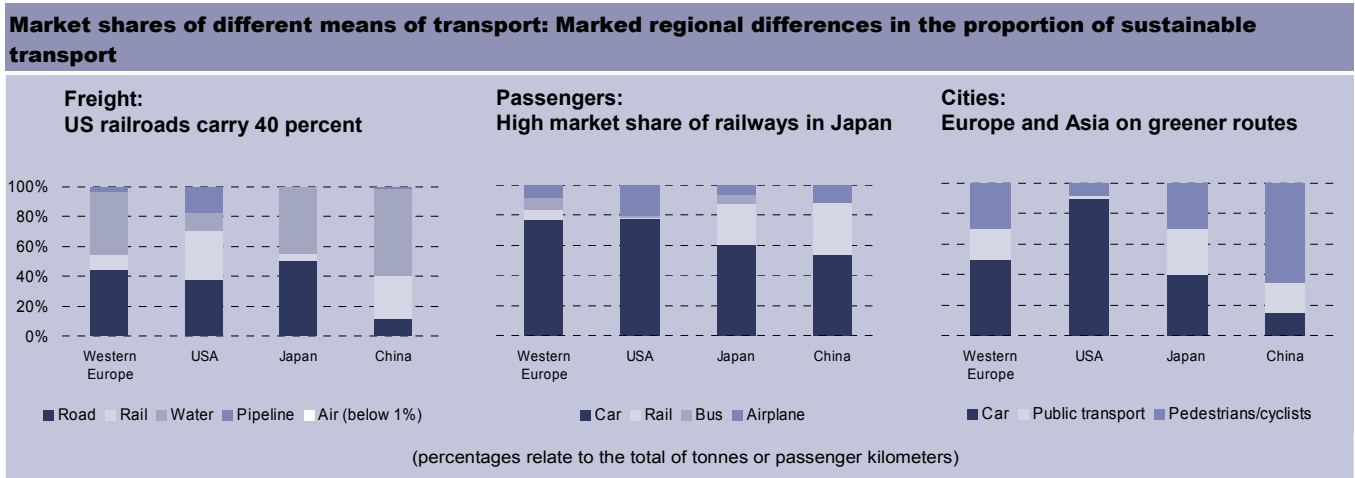
Companies' success in winning market share primarily depends on the quality of the transport they offer: only reliable, safe and clean trains travelling at frequent intervals and linking into other transport providers will consistently attract customers in the long term. On the other hand, problems with service quality, safety and pricing undermine the industry's competitiveness. The systemic nature of public transport means that the shortcomings of one provider (especially a dominant ex-monopoly) have a negative impact on the entire sector.

... for winning market share and for switchover effects

In North America, topography and privatisation have encouraged the development of an efficient rail freight system which handles almost 40% of domestic goods transport – far higher than the 10% level in Europe. In Japan, the level of passenger transport by rail (27%) is a huge success story. In the UK, where transport has been dogged by crisis, railway operators have recently recorded their best punctuality figures for decades, and the number of train users has climbed to a record high.

Urbanisation: powering the transport industry forward

Even though transport is a rather lethargic and capital-intensive system that depends heavily on regional conditions, current trends highlight attractive market potential. The relentless pace of urbanisation – in 2006 more people lived in towns than in the country for the first time – lends extra force to political calls for efficient transportation systems.



Source: Eurostat; Bureau of Transportation Statistics (US); Ministry of Land, Infrastructure & Transport (JP); Asian Development Bank; Millennium Cities Database

Safety: big responsibility, complex task

Rail transport has a much lower rate of fatal accidents than recorded on the roads. Nevertheless, safety is a top priority and failings in the prevention of accidents, vandalism, terrorist acts and epidemics present a significant risk for public transport. In Japan, the derailing of bullet trains (Shinkansen) has triggered a public debate about their safety. Railway companies are constantly looking for ways to boost efficiency – whether it be through running trains more frequently, achieving faster speeds or using longer trains. At the same time, the number of supervisory personnel is being reduced in many areas, and being replaced by IT solutions. This can quite easily disrupt the complicated structure required to ensure safety.

Industrial relations: strikes are the sector's Achilles heel

Industrial unrest is a significant industry risk that has financial repercussions. In the area of transportation, customers are affected very directly by work disputes and strikes. The systemic nature of the transport sector presents numerous op-

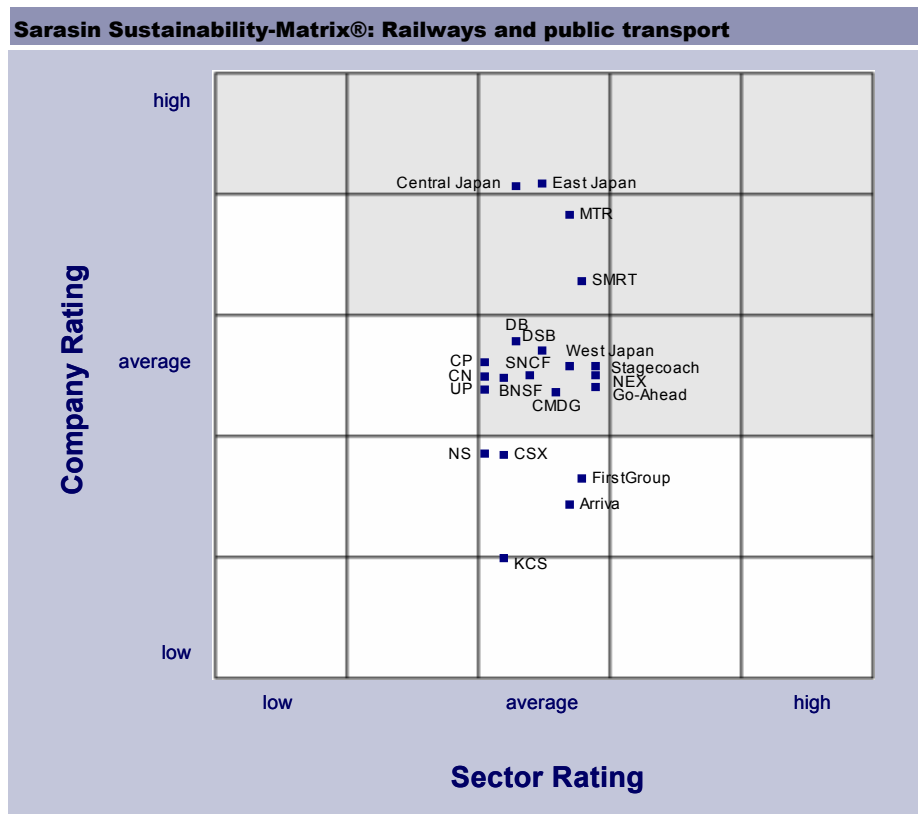
portunities to multiply the effects of individual industrial action – strikes at the start of holiday periods, on main routes, and in central transfer hubs. It is therefore very important for transport companies to foster good relations with employees and trade unions. In Europe, clearly defined arbitration procedures have helped to reduce the number of industrial disputes in various countries.

Tougher noise and emissions regulations

In recent years tougher legislation has been introduced for the industry in both Europe and the US, or stricter standards are currently under discussion. As a result, companies with very old rolling stock may soon be forced to invest heavily. A high degree of electrification can offer an advantage over systems powered mainly by diesel.

Results of the company evaluation

The results of the sustainability assessment of 21 rail and public transport companies are summarised in the Sarasin Sustainability-Matrix® below.



Source: Bank Sarasin

Leaders: two Japanese rail companies – big market shares, excellent quality

Japan's two railway companies **East Japan Railway** and **Central Japan Railway** have the best ratings. Active solely in the transportation of passengers, over the years they have established a very high standard in the areas of punctuality, customer satisfaction and safety, and are also able to compete with airlines even over large distances. East Japan Railway is also exceptionally innovative in its environmental initiatives and has set itself very ambitious targets in the area of energy efficiency. Since a major accident with 100 deaths on West Japan Railway in 2005, however, experts are concerned that Japanese railway companies are relying more and more on IT systems to provide the necessary level of safety, and by cutting their workforce could be faced with a lack of experienced personnel.

Followed by efficient Asian municipal train operators

MTR and **SMRT** also score very well. These two operate large sections of the heavily used public transport system in Hong Kong and Singapore. MTR is also heavily involved in the construction of new residential and commercial properties. With the planned merger with Kowloon-Canton Railway (KCRC) on the Chinese mainland, the existing property portfolio could increase from 60,000 to almost 100,000 homes. In the field of transport, MTR has a more progressive environmental management policy than SMRT and has already taken initial

steps to ensure its properties are managed in a sustainable way. The quality and safety of transport on offer is good with both companies, although there are still a few reservations in the case of KCRC. Both companies also have impressive track records in the area of personnel management. MTR has won numerous accolades and has reached an agreement with trade unions on minimum wages for outsourced cleaning and safety work.

Europe in the midfield: large, partly privatised railways ...

The three European railway companies analysed are positioned in the midfield of the sustainability matrix. **Deutsche Bahn (DB)** has an impressive environmental management system and is successfully growing its goods transport business. However, it still has a number of shortcomings in passenger transport, particularly when it comes to customer service and punctuality on long-haul routes. Denmark's **Danske Statsbaner (DSB)** still has 75 percent of its trains powered by diesel and has been unable to meet its initial targets for reducing greenhouse gases. The fundamentally good quality of the transport service was slightly spoiled by the increasing number of delays. France's **SNCF** performs better in passenger transport than its German counterpart, and managed to win market share on a number of important routes. By contrast, its goods transport business is in a very poor state and SNCF already lost some of its share when the market was deregulated. Industrial relations were improved following the agreement of common arbitration rules.

... and three out of five UK privatised firms: improved quality ...

Average ratings were given to **West Japan Railway** (shortcomings in the management of traffic safety, and in environmental protection measures), Asia's **ComfortDelgro (CMDG)** (failure to enforce environmental management, but successful expansion of the bus system in Chinese cities) as well as three of Britain's five biggest companies active in public transport. In the UK, the quality of passenger rail travel is still much lower than in continental Europe. However, **Stagecoach** and **National Express (NEX)** are now achieving satisfactory quality standards, and the same applies to **Go-Ahead's** bus operations in London.

... but rail network is a sword of Damocles

One legacy of Britain's rail privatisation has been the separation of the rail network from the business of running the trains. A series of accidents has highlighted the risks of this heavily fragmented organisation, along with the inherited burden of years of underinvestment in the rail network. Surprisingly, a look at the long-term accident statistics shows that safety has actually improved since privatisation. The three companies have set goals and measures in the field of environmental protection, such as the increasing use of biofuels and particulate filters on 20% of Stagecoach's bus fleet. **FirstGroup** – Britain's biggest public transport operator – and **Arriva** show serious shortcomings in the key criteria for assessing environmental performance and quality, and therefore receive a below-average rating.

North America's rail freight: high market shares, high quality ...

Four out of seven North American rail freight companies are positioned in the midfield. They all use diesel-powered locomotives. However, the sector has managed to reduce the emission of greenhouse gases and nitrous oxides, responsible for summer smog, by 20% (per tonnes-km) since 1990. With the exception of **Canadian Pacific Railway (CP)**, however, there is very little systematic reporting on progress in environmental management. An agreement exists in Canada for the voluntary reduction of CO₂ emissions. And unlike its

... and differences in environmental protection and safety

rival, **Canadian National Railway (CN)**, CPs number of derailments and other accidents have not increased as sharply. In many cases derailments were caused by running trains that are too long. CN has had fines and a series of safety conditions imposed on it.

In the US, **Burlington Northern Santa Fe (BNSF)** and **Union Pacific (UP)** have a slightly better rating, thanks to a rather more progressive environmental management and to some extent excellent results in traffic safety (BNSF) and the prevention of work accidents (BNSF and UP) compared with the smaller companies **CSX**, **Norfolk Southern (NS)** and **Kansas City Southern (KCS)**. Their stronger position in environmental protection is partly down to the fact that they are doing business in California, which has far stricter environmental regulations. US railway workers enjoy good employment rights that offer extensive protection from redundancy, and also benefit from collective wage bargaining. Some rail operators are exposed to slightly higher risks due to class actions for asbestos claims and shortfalls in their company pension plans.

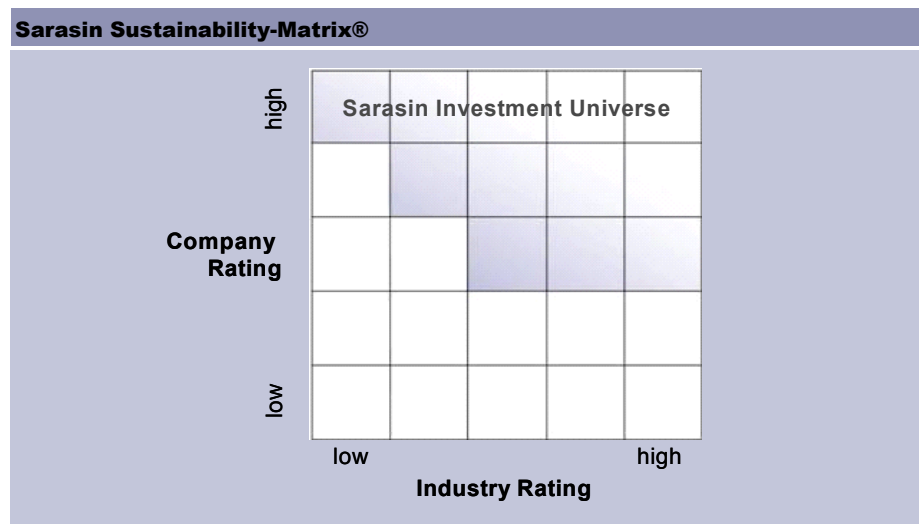
Sustainability analysis methodology

Matrix combines industry and company rating

Our environmental and social analysis of companies is based on a proprietary valuation method developed by Bank Sarasin. It incorporates two dimensions which are combined in the Sarasin Sustainability Matrix®:

- ◆ **Industry rating:** Comparative assessment of industries using selected environmental and social criteria.
- ◆ **Company rating:** Comparative environmental and social analysis of companies within their industry.

Only the companies positioned in the Sarasin investment universe (shaded) qualify for Bank Sarasin's retail sustainability funds.



Source: Bank Sarasin

Evaluation criteria

When assessing individual companies, we consider how they handle the environmental and social risks specific to their industry and exploit the relevant opportunities. The main criteria are the same for all industries. They are compared with the industry average in the company's environmental and social profile and then aggregated into an overall rating. The weighting of the main criteria and the selection of the subcriteria are industry-specific.

Controversial activities

Certain business activities which are not deemed to be compatible with sustainable development (e.g. armaments, nuclear energy, tobacco, pornography) can lead to the exclusion of companies from the Sarasin sustainable investment universe. The Fund's Advisory Council makes this selection for our retail funds Sarasin Sustainable Equity (formerly ValueSar Equity) and Sarasin OekoSar Portfolio.

Information sources

The company rating is based on the company's own details, press reports and information from independent institutions. The companies are contacted to clarify any open questions or contradictions. We do not use standardised questionnaires.

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Publications

Solar Energy 2006	Solar Energy 2006 - Light and shade in a booming industry. Matthias Fawer, December 2006
Banks	Banking on sustainability – An analysis of the social and environmental aspects of international banks. Klaus Kämpf, November 2006
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