# Rail solutions to the mobility challenge

## Interview with Michael Clausecker, Director General of UNIFE, and Jean-Luc Favre, CEO of ABB Sécheron and Head of ABB Rail Sector

The mobility of people and goods is essential to today's economy: Global trade is calling for the affordable and timely transportation of freight over long distances. Business and tourism depend on people travelling between cities. Growing urbanization means people are also commuting over longer distances within cities. At the same time, concerns over the environment, energy prices and congestion are calling for ways to minimize the economical, ecological and spatial footprint of transportation. It is thus no surprise that governments across the world are rediscovering railways. From urban metros through national and international high speed trains to trans-continental freight corridors, railway investment is growing. Michael Clausecker, Director General of UNIFE, and Jean-Luc Favre, CEO of ABB Sécheron and Head of ABB Rail Sector, discussed the challenges and outlook of tomorrow's railways with *ABB Review*.

Mr. Clausecker, could you briefly introduce UNIFE?

Michael Clausecker: UNIFE [1] was set up to support railway equipment manufacturers in Europe. It does this:

1 By seeking technical harmonization and regulation of railway systems.
2 By lobbying for policies that are favorable to the development of the rail segment.
3 By launching and supporting programs to help member companies conduct research jointly with railway operators and by facilitating the associated application for European funds.
4 By ensuring the superior quality of the products of its member companies throughout the entire value chain, using its quality-management program, IRIS [2].

UNIFE is funded by its members, who are all private European companies supplying to railways across the world. The organization also has associate members (mostly national rail supply associations). There are about 70 companies in UNIFE and almost 1000 in its national associations. UNIFE thus speaks for the largest part of the European rail industry.

What are the major challenges and developments that the railway industry will face in the next decade?

Michael Clausecker: Let us start with high speed. Today, major projects are underway in France, Spain and Great Britain. In the United States too, the debate about high-speed lines has finally begun. Russia is making progress on the Moscow to St. Petersburg project. The Chinese are investing more than anybody else and building thousands of kilometers of high-speed lines. The sector is experiencing massive growth.

Where do you see future priorities?

Michael Clausecker: The vast majority of high-speed connections today are national: in France, Germany, Spain etc. There are of course also international services, such as Eurostar or Thalys, but the further development of high speed in Europe will need to have a more international focus.

For governments, the key issue for the next 10 years will be investment in infrastructure. I believe we will see growing willingness to invest in rail, and also more innovation in financing such schemes. This can include public-private partnerships and build, operate and transfer models.

> The future will see more cross-border freight transport in Europe. This will call for more multi-system locomotives compatible to different voltages and signaling systems.

And in other parts of the world, such as Eastern Europe or India?

Michael Clausecker: I hope we will see the construction of the first high-speed line in Eastern Europe in the next decade. There is already a plan to start building a high-speed line in Poland by 2014.

In the case of India, it is difficult to foresee when high-speed will become a reality. The main developments there today are in metros and urban rail.

Jean-Luc Favre

We have to consider the effect of demography. Most probably there will be nine billion people on the Earth by 2050. There is also a strong trend towards urbanization. In 2008, for the first time, half of the Earth's population was living in cities. There is a clear case for sustainable transportation and rail can deliver that ➔ 1.

In China, huge investments are going on in freight and passenger rail and also electrification projects. The high-speed network is growing at an astonishing rate. For ABB, China has been the fastest growing market over the last two to three years. Europe is also a strong market, but when it comes to network growth and investments in new locomotives and trains, it is in China that we are seeing the most significant developments.

In India too, we are starting to see projects move forwards. Freight corridors are being created – freight can be moved more efficiently in dedicated corridors. However, the fastest growing market in India is metros. The government wants all cities above three million to have a metro. There are huge projects in Bangalore, Kolkata, Mumbai and Delhi. We are also expecting a high-speed market to emerge there in the next five to ten years.

You have both mentioned urban transportation. What are the main trends there?

Michael Clausecker: Large cities are becoming even larger, and with them the importance of transportation. It is becoming more and more difficult for citizens to get to and from work in the morning and evening. Clearly public transport is an efficient way to address that challenge. It is no surprise that we are seeing many major cities implementing transit systems, in particular in China. But even cities such as Paris and London are struggling with traffic congestion and realize that they need to add transit capac-

Footnotes

1 UNIFE: Union des Industries Ferroviaires Européennes, (Union of European Rail Industries)
2 IRIS: International Railway Industry Standard. See also inset 7 on page 23.

1 In 2008, for the first time, half the Earth's population was living in cities. The importance of urban transit is growing.

2 Trams are not just environmentally friendly; they are also people friendly. They contribute to making city centers more attractive.

ity to retain their positions as attractive and competitive places to do business.

The development of urban transit will continue to accelerate in the coming years. In particular, there is a push to encourage the private sector and individuals to contribute. For example, land owners around stations who make a contribution to transit development can benefit through the increased value of their land or business. I also think that we will see more road pricing schemes of the type implemented in London. In both cases, users are making an increased contribution to the external costs of their transport use, and in doing so supporting the further development of public transit.

The developing world presents a special challenge. There is little infrastructure in place and everything has to be developed from scratch. If we can support regional governments in proving that a metro will attract investment capital, bring additional jobs and increase tax revenues, this can help those governments secure loans and create a clear business case.

Smaller cities often require transit systems that are lighter and cheaper than metros.

Michael Clausecker: There are two tendencies. In Germany, some towns are introducing larger buses. Double articulated buses are relatively cheap and do not require special infrastructure. On the other hand, many new tramway projects are being realized across Europe and in the United States. Trams provide a higher capacity than buses, and don't share their downsides: They produce zero emissions at the point of use and are quieter. But they are not just environmentally friendly: They are also people friendly. Trams contribute to making city centers more attractive ➔ 2. So we see a strong trend towards tramways even though competition from bus makers is very inventive in seeking to emulate these advantages at lower cost.

We are also seeing a sort of grey area between the two in the form of trams running on tires …

Michael Clausecker: Anything is possible, and if it serves its purpose it should be explored. When you compare trams with buses weight-wise, you can rightly ask whether they are facing the same safety requirements. It is difficult to predict how the market will develop, but the industry will not stop seeking ways of making its product lighter and more competitive.

> Every kilogram we save and every bit of additional space we can provide to carry additional passengers leverages the train's overall economic and ecological advantage.

How about freight railways?

Michael Clausecker: Due to the economic downturn, freight operators have had to mothball many locomotives and wagons. The first challenge in the coming decade will be to return freight volumes to the levels of 2007. Only then can the equipment that has already been built be used to its intended capacity.

Another trend will be towards a greater international use of locomotives. The future will see more large rail operators, but also small companies providing transport across borders in Europe. This will call for more multi-system locomotives compatible with different voltages and signaling systems.

In other parts of the world, tendencies are more difficult to recognize. But wherever you look, locomotives are about efficiency and reliability and price. I'm sure that more and more customers will be concerned about energy consumption and overall lifecycle cost and as an industry we must be able to provide them with data that enables them to compare products and options.

Will increased competition raise the total volume of rail freight?

Michael Clausecker: Absolutely. Those countries in Europe that have really opened their networks to competition have seen traffic grown by between 60 and 130 percent over the last 15 years. Furthermore, usually over the last five to six years, rail freight has grown faster than road freight. Assuming that further countries will open their markets, we can count on a continuation of this strong growth over the next decade ➔ 3.

3 Privatization and competition are leading to massive growth in rail freight: between 60 and 110 percent in the last 10 years.

4 The largest lever in to reduce transport emissions lies in shifting traffic from roads and air to railways.

If you compare the number of locomotives sold in the last decade, the number has practically tripled compared to the 1990s. Half of these locomotives are in the hands of customers that didn't even exist a decade ago. The opening of markets to competition is definitely growing the market for rail freight.

Despite this growth, rail freight in Europe remains low compared to the United States.

Michael Clausecker: We have different national markets, and the share of rail differs from country to country. Look at Sweden for example: a country which geographically speaking can be compared with the United States. Not in size of course, but in terms of population density. Rail freight has a market share above 30 percent – a figure comparable to the United States. However, the US is not Europe, and rather than being a continent with population concentrated along the East and West coasts, Europe has a much more distributed population. Transport distances are shorter making it more difficult for railways to compete with roads.

However, I'm sure that with markets opening and the development of more international, trans-European rail paths, we will see the market grow.

Rail is already one of the most environmental and sustainable means of transportation. What can the rail industry do to further reduce its carbon footprint?

Michael Clausecker: Let us put things into perspective. The largest lever in the hands of politicians today to reduce transport emissions undoubtedly lies in shifting traffic from roads and air to railways. These gains can be enhanced by technological improvements on the trains themselves, but the largest contributor remains the shift itself → 4.

What can rail itself do to improve its carbon footprint? The most important strategy here is electrification. It's not a surprise that if we look at the Unted Kingdom, for example, where the majority of railway lines are operated with diesel trains, we see that the government is thinking a bit more than other European governments about using electrification as part of its strategy to address climate change and provide real and sustainable solutions in the transport sector.

So in terms of energy efficiency, the ball is with the governments?

Michael Clausecker: Yes, but we have to support such strategies by developing more attractive products that help railways attract passengers and goods.

Concerning energy consumption, one great opportunity lies in capturing braking energy and using it for acceleration or storing it on the vehicle or along the lines.

Jean-Luc Favre: The most effective way to shift people from air and road to rail is to supply competitive and cost-effective solutions. When we are moving passengers at 350 km/h for example, every kilogram we save and every bit of additional space we can provide to carry additional passengers leverages the train's overall economic and ecological advantage. We will therefore continue to optimize our equipment in terms of space and weight, but also reliability and efficiency.

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Normally we consider (besides Japan), Europe as one of the pioneering regions for high-speed know how. Can these lessons be applied in other parts of the world?

Jean-Luc Favre: When it comes to technology for high speed and very high speed, Europe is dominating the market together with Japan. However, we are now seeing that in China, Chinese companies are developing their own high-speed trains. There was even a recent announcement that GE and a Chinese company were partnering to jointly develop high-speed corridors in North America. The market is developing quite well for newcomers.

So far we've looked at products and technologies. Another area that is growing in importance is service.

Jean-Luc Favre: There are markets where contracts do not only include the delivery of the vehicle, but also encompass the service for a period. But this tendency is not universal. There are many markets in which operating companies prefer to continue to do all maintenance in-house.

Looking at liberalization, newcomers are primarily interested in operating trains and moving people. They are therefore more open to outsourcing maintenance. On the other hand, incumbent operators typically have their own maintenance shops and staff. Understandably, outsourcing this kind of activity isn't a priority for them.

As far as our ability to offer service is concerned, ABB is in the unique position of being able to offer a global service network: We are Chinese in China, Indian in India and European in Europe.

Michael Clausecker: There is a differentiated picture between rolling stock maintenance and infrastructure maintenance. For rolling stock, the only examples of which I can think where industry did not just supply the vehicles but also provided the associated maintenance serve operators that are private companies. For us as manufacturers, involvement in service has helped better understand the performance of our vehicles in day-to-day service and close the feedback loop. This allows us to use the knowledge gained to make better product and ultimately benefit our customers.

The infrastructure industry is slightly different. A typical structure involves the customer having its own people for maintenance, but also tendering parts of the work out to third parties. So we are looking at a situation where we as suppliers are to some extent competing with our customers, creating a rather different business situation. As with rolling stock, we can provide value to our customers because we often know the product better than they do. By applying a mix of preventive and corrective maintenance we can reduce both costs and downtime.

What is ABB's role in, and contribution to UNIFE?

Michael Clausecker: ABB is a truly international and global company. This makes ABB's participation in UNIFE very valuable. ABB is still a relatively new member, and we at UNIFE and the other members are keen to benefit from ABB's experience in foreign markets and also to do business together. We are heavily involved in developing railway standards here in Europe and are pleased to have ABB's input and contribution, which I value.

Jean-Luc Favre: In 2005, ABB decided to develop its railway business. We've been incredibly successful in growing sales from 200 million in 2004 to 1.3 billion in 2009. We work closely with the industry's key players – Bombardier, Alstom, Siemens – who are European companies. For ABB, it's really important to be back in the railway market, working with these partners and participating in UNIFE. We joined in June 2009 and are now also one of the Brussels representatives of UNIFE members and also serve on the infrastructure committe of UNIFE. The strong message we want to send to this industry is that we are part of it and will be contributing to it in the long term. We have vital technologies including breakers, transformers, converters, semiconductors, motors, generators, turbochargers and fixed installations. We can supply electrification, AC and DC substations and their components. We can offer a global production and know-how footprint. For example, we are already producing transformers in North America, South America, China and India and are local in all those markets. These are the strengths of ABB as a global company and are just as applicable in the rail sector as they are in other sectors.

It may sound surprising, but as recently as 2002, even inside ABB hardly anybody knew what our involvement with railways was. We had excellent technologies but these were hardly known.

Where do you see the most significant current contribution to railway technology? What constitutes ABB's leadership?

Jean-Luc Favre: Our portfolio and footprint makes us unique on the market. We can work with all the different suppliers and benefit from a strong technology base. We have all the key technologies that are needed to bring traction power to the line and inside the vehicle. That is the main reason that we grew so fast over the last five years. We grew by more than 40 percent a year, more than 10 times faster than the market. Today, according to my calculations, we rank among the five major suppliers to the railway industry, supplying technologies to OEMs for end-users

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Michael Clausecker: ABB helps keep this industry diverse. We have seen quite some consolidation in the rail supply industry. When we look at system integrators, there are rapidly growing manufacturers such as Stadler, CAF, and Talgo. These companies rely on independent suppliers of traction and propulsion technologies, and ABB is clearly a leader here, if I may say so. ABB is also important in terms of bringing technologies to the market, especially in view of its global approach which is helping experienced European companies in offering their technologies to a world-wide market.

Jean-Luc Favre: Exactly. We are not only able to support our partners in Europe but also to work with them in China for example. We started to do business there with Alstom in 2004, because they needed to localize traction transformers. Our supply to Alstom was limited before that, but now we have become important partners.

ABB is a large and diverse company. It has a global power and automation business and a lot of experience and know how in a broad range of fields. Do you see any areas in which the rail business can benefit from this broader knowledge base?

Jean-Luc Favre: Most certainly. Let us look at traction motors, for example: When we decided to design a new traction motor, we could draw on the motor technology and business of ABB, a business of $2 billion. Similarly, we benefit from having a global supplier base. We use the same suppliers and also the same ABB factories for industrial motors as we do for traction motors. If we look at transformers or converts we see a similar picture.

Do you think the rail industry can learn from the automotive industry?

Michael Clausecker: We can always learn, but we must not copy blindly. We looked at the auto industry when we were reconsidering quality management in our own industry, but then actually benchmarked our system to that of the aviation sector. We are in a position to look at different industries and cherry pick the methods that are most applicable to us.

It is interesting to observe that many people in our industry are coming out of the automotive industry: management and purchasing organizations for example.

One difference between our industry and automobiles is that the lot sizes we work on tend to be much smaller. We try to counter that by platforms and standardization (strategies also found in car manufacturing). This helps us create product platforms which we no longer sell only in one country but sometimes across the globe. The key here lies in the clever design of the product platform permitting it to meet different standards (obviously the international standardization of those requirements is also a goal worth pursuing). As common railway standards are agrred on here in Europe, more and more countries in the world are copying them or using them as a reference, hence the importance of our work in this area. We have seen China, for example, adopting many of our railway standards. For example, the Chinese have adopted the ERTMS [3] specification for signaling on new high-speed lines. They selected ERTMS because it is the best developed standard in the world and because a large number of companies across the world can offer products

Michael Clausecker is Director General of UNIFE.
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Footnote
3 ERTMS (European Rail Traffic Management System) is a European initiative working towards a single standard for signaling and train control systems.

Michael Clausecker, UNIFE Director-General

Born in Stuttgart, Germany in 1966, Michael Clausecker studied business economics and began his professional career at Daimler-Benz, subsequently moving to the German Privatisation Office. In 1993 he was appointed Managing Director at DWA Deutsche Waggonbau AG, later Bombardier Transportation, and led it to become the leading rail freight car manufacturer in Europe. 1999 saw Clausecker become Head of Division at Siemens AG in Erlangen and Munich with worldwide responsibility for locomotives. In 2001, he was appointed Managing Director of the German rail supply industry association – VDB and in early 2007, Clausecker was appointed Director-General of UNIFE. Michael Clausecker holds an MBA from the Open University in the United Kingdom.

Jean-Luc Favre, Head of ABB's railway business and CEO of ABB Sécheron

Born in Thonon, France, in 1962, Jean-Luc Favre began his professional career as electrical engineer at BBC. Following a three-year experience at IBM, he was appointed manager of the transformer business at ABB Sécheron SA in Geneva. In 2001 he became General Manager of the company and was appointed Head of ABB's railway business in 2005. Jean-Luc Favre holds a degree of electrical engineering from the Federal Polytechnic School of Lausanne.