RAILWAY ELECTRIFICATION – GLOBAL MARKET TRENDS
Volumes, Projects, Players, Trends

Available in English from 17th April 2018.
Now you can also purchase the data annex in Excel format (see data sheets overview on page no. 5 for more information).

This study entitled “Railway Electrification – Global Market Trends” provides a comprehensive overview into the structure, procurements, manufacturers and development trends in the market for railway electrification.

With this study, SCI Verkehr delivers market and business information of competitive relevance on the current and future volumes in the worldwide market for new development and upgrade as well as maintenance and renewal. In addition, the study identifies and evaluates key information concerning the companies active in the market.

In concrete terms, this multi-client market study of railway electrification includes:

– Overview and analysis of the worldwide market for railway electrification, divided into eight world market regions and 20 countries presented in detail
– The size and development of the markets for catenary equipment and traction power equipment in the period 2017 to 2022, differentiated by four types of transport and the purpose of the investment (new development, upgrade, renewal and maintenance)
– Information about the leading suppliers of catenary equipment and traction power equipment and their market shares in the market regions
– Length of the electrified line networks, major new development and upgrade projects

All in all, the study provides a well-founded analysis of the worldwide market for railway electrification. The study therefore provides both companies established in the railway industry as well as active and potential operators with important information for operational and strategic planning.

SCI Verkehr analyses markets from the bottom up: based upon systematic observation of the railway markets, a detailed worldwide database of the installed base and projects forms the basis for in-depth studies on the various segments of the railway industry and the most important regional focus markets. Through the continuous production of its MultiClient Series, SCI Verkehr systematically analyses 35 core countries and more than 100 individual markets for railway industries. These studies also go into further detail regarding technological and railway operational aspects, which are not illustrated in this study.

SCI Verkehr GmbH is an independent consultancy company specialising in the markets and economics of transport. We have close connections to the rail industry, with consultants in a wide range of specialist fields. We have an extensive network of experts in Germany and abroad and we specialise in market and strategy issues for the mobility sector. Our activities focus on companies in the transport and rail industry, logistics, public and private transport companies and transport and economics departments in public administrations at national, regional and municipal levels.

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DATA ANNEX IN EXCEL FORMAT

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1.3 Market volume segments (Pivot)
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3 Market shares
3.1 Market shares (Pivot)
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4 Additional Tables
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### 6 The Market for Railway Electrification in North America

#### Summary: North America 2017

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<tr>
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<tbody>
<tr>
<td>Overhead contact line equipment</td>
<td>xx</td>
<td>x%</td>
<td>x%</td>
</tr>
<tr>
<td>Traction power supply equipment</td>
<td>xx</td>
<td>x%</td>
<td>x%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>xx</td>
<td>x%</td>
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<td>Renewal and maintenance</td>
<td>xx</td>
<td>x%</td>
<td>x%</td>
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<tr>
<td>New development and upgrade</td>
<td>xx</td>
<td>x%</td>
<td>x%</td>
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<tr>
<td><strong>Total</strong></td>
<td>xx</td>
<td>x%</td>
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<tr>
<td>HSR transport</td>
<td>xx</td>
<td>x%</td>
<td>x%</td>
</tr>
<tr>
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<td>xx</td>
<td>x%</td>
<td>x%</td>
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<tr>
<td>Metro</td>
<td>xx</td>
<td>x%</td>
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<td>LRT</td>
<td>xx</td>
<td>x%</td>
<td>x%</td>
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<tr>
<td><strong>Total</strong></td>
<td>xx</td>
<td>x%</td>
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6.1 Overall Market

North America is made up of the USA, Canada and Mexico. The region is largely influenced by developments in the USA.

The railway has an important role in commercially operated freight transport. With large transport distances, integrated and larger structure clearances plus very high reliable axle loads, much higher quantity effects can be achieved than in Europe. These lines are not electrified.

On the other hand, trans-regional passenger rail transport remains substantially below its economic possibilities, also taking into account the attractiveness of air transport for the sometimes very long journey distances between commercial centres. Moreover, the attractiveness of automobile transport is important both for long-distance and for local transport. Low oil prices, developed infrastructure and cultural orientation towards individuality contribute to this trend. Passenger rail transport performance is generated in metropolitan areas for the most part.

**Rail infrastructure 2017**

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</thead>
<tbody>
<tr>
<td>29</td>
<td>323 500 / 1%</td>
<td>1 600</td>
<td>1 700</td>
</tr>
</tbody>
</table>

The line network in North America is the longest in the world, but it only has a very low degree of electrification and is single-track for the most part. The technological level is lower than in Western Europe.

**Market Volume/Market Development**

**Market volume [EUR million]**

**North America**

![Market volume chart](image1)

Figure 26: Market volume in North America

The market size is expected to grow annually with around x% both for the new development and upgrade market as well as the maintenance and renewal market up to 2022. Starting from a high level for this region, investment in electrification will continue in the medium term. Upgrade of passenger rail is the main driver for development of the electrification market. If a major part of the commuter rail electrification plans in Canada are realised, the growth rate will be even higher.
For urban rail networks, development has been dynamic for years. Large projects are underway in e.g. Washington, Houston, Denver, Dallas, Los Angeles and Seattle.

Manufacturers/Market Shares

In 2016, the Caltrain Board of Directors approved $1.25 billion in contracts to begin work on the Peninsula Corridor Electrification Project (PCEP). Balfour Beatty has been awarded a EUR 624 million (USD 697 million) contract to electrify the 84 km Caltrain rail corridor between San Francisco and San Jose, laying the foundations for the future operation of high speed trains (HST). Balfour Beatty will design and build a 25 kV AC overhead catenary system to serve as the power source for the new HSTs and will construct two traction power substations, one switching substation and seven paralleling substations.

The local provider Mass. Electric Construction Company (MEC) and IMPuls NC LCC are leading local players. MEC is a Kiewit Corporation Subsidiary; which is one of North America’s largest construction, engineering and mining organizations. IMPulse NC LLC operates as a subsidiary of the Marmon Group LLC. Marmon Group is an industrial United States holding company headquartered in Chicago, held by the Berkshire Hathaway group since 2013.

Siemens is active in the field of mass transit, e.g. in September 2017; the Mid-Coast Transit Constructors joint venture of Stacy & Witbeck, Herzog and Skanska has awarded Siemens a contract to supply power and automation systems for San Diego Metropolitan Transportation System’s 17 km Mid-Coast Corridor light rail extension. The contract announced includes the provision of overhead electrification equipment, lineside substations and signalling.

Figure 27: Market shares of electrification suppliers 2013-2017
New development and upgrade North America

Current market volume: ~ EUR 200 million
6.2 USA

Profile: USA 2016

<table>
<thead>
<tr>
<th>Socio-economic data</th>
<th>USD 19 362 billion</th>
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<tr>
<td>GDP</td>
<td>19 362 billion</td>
</tr>
<tr>
<td>Population</td>
<td>325 million</td>
</tr>
<tr>
<td>Urbanisation</td>
<td>82 %</td>
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<thead>
<tr>
<th>Rail infrastructure</th>
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</thead>
<tbody>
<tr>
<td>Mainline railway network</td>
<td>246 230 km</td>
</tr>
<tr>
<td>Degree of railway electrification</td>
<td>1 %</td>
</tr>
<tr>
<td>Urban transport network</td>
<td>2 680 km</td>
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<tr>
<td>Maintenance and renewal</td>
<td>xx</td>
<td>x%</td>
<td>x%</td>
</tr>
<tr>
<td>New development and upgrade</td>
<td>xx</td>
<td>x%</td>
<td>x%</td>
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<tr>
<td>Total</td>
<td>xx</td>
<td>x%</td>
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Market Environment/Investment Trend

For the electrification market, solely the passenger rail market is relevant, as the long-distance freight lines operated by Class I Railroads are not electrified and there are no plans to electrify them. Passenger rail in the USA is mostly composed of commuter rail services, which constitute over 60% of overall performance.

The US Federal Transit Administration (FTA) has decided to delay a EUR 612 million (USD 647 million) full funding agreement for Caltrain's electrification project until President Donald Trump has developed his budget for the fiscal year of 2018. [...] Already in July 2016, Caltrain's Board of Directors awarded contracts to Balfour Beatty and Stadler Rail to construct infrastructure for the electric trains and the electric trains themselves, respectively. Balfour Beatty was awarded a $697 million contract, its largest contract in the United States, to electrify the line at 25kV AC, replace signalling systems, construct two traction power substations, one switching substation, and seven paralleling substations.

Market Volume/Market Development

Maintenance and renewal make up 35% of the overall market, as the degree of electrification is very low. While most major US cities have a well-developed metro system, large investments have been made in LRT since the past 10 years and this is continuing. The market volume for LRT has a share of more than one third in the current overall market volume, which is more than anywhere else.
Current market volume railway electrification in USA

![Investment purposes and Transport modes](image)

Average total market volume p.a. 2016-2018

Figure 28: Current market volume for railway electrification in the USA

Important new development and upgrade infrastructure projects 2016 to 2022:

<table>
<thead>
<tr>
<th>Project title</th>
<th>Transport mode</th>
<th>Estimated/announced volume for electrification [in EUR million]</th>
<th>Construction period</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSR Dallas-Houston</td>
<td>HSR</td>
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