

2018



RAILWAY ELECTRIFICATION – GLOBAL MARKET TRENDS

Volumes, Projects, Players, Trends

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.

Contact:

SCI Verkehr GmbH

Alexander Apking

Tel.: +49 221 93178 0

E-Mail: a.apking@sci.de

CONTENTS

1	Executive Summary: The Worldwide Market for Railway Electrification.....	13
2	Market Delimitation and Methodology of the Study.....	21
2.1	Market Delimitation	21
2.2	Market Analysis Methodology.....	23
3	Product Segments: Overview and Summary.....	25
3.1	Overhead contact lines	25
3.2	Traction power supply.....	27
4	The Market for Railway Electrification in Western Europe	29
4.1	Overall Market	29
4.2	Germany.....	34
4.3	France	38
4.4	United Kingdom	43
4.5	Spain	47
4.6	Italy	50
5	The Market for Railway Electrification in Eastern Europe	54
5.1	Overall Market	55
5.2	Poland	58
5.3	The Czech Republic.....	62
5.4	Turkey	65
6	The Market for Railway Electrification in North America	68
6.1	Overall Market	69
6.2	USA	71
7	The Market for Railway Electrification in South and Central America	74
7.1	Overall Market	75
7.2	Argentina.....	78
7.3	Brazil.....	81
8	The Market for Railway Electrification in Asia	84

8.1	Overall Market	85
8.2	China	87
8.3	India.....	95
8.4	Japan.....	99
8.5	South Korea	101
9	The Market for Railway Electrification in the CIS.....	104
9.1	Overall Market	105
9.2	Russia.....	110
9.3	Ukraine	112
10	The Market for Railway Electrification in Africa/the Middle East	115
10.1	Overall Market	116
10.2	Iran	119
10.3	South Africa.....	122
11	The Market for Railway Electrification in Australia/Pacific	125
11.1	Overall Market	126
11.2	Australia.....	129



DATA ANNEX IN EXCEL FORMAT

DATA SHEETS OVERVIEW

1 World Market

- 1.1 World Market Overview (Pivot)
- 1.2 World Market Overview (Data)

Sum of Value		Y1	2017	2016-2018	2017-2022
Region	Evaluation criteria				
Africa/Middle East	Electrified network development		XXX		X
	Average volume		XXX	XXX	X
	Average development				X
Asia	Electrified network development		XXX		X
	Average volume		XXX	XXX	X
	Average development				X
Australia/Pacific	Electrified network development		XXX		X
	Average volume		XXX	XXX	X
	Average development				X
CIS	Electrified network development		XXX		X
	Average volume		XXX	XXX	X
	Average development				X

2 Market Volumes

- 1.2 Market volume regions (Pivot)
- 1.3 Market volume segments (Pivot)
- 1.4 Market volume countries (Pivot)
- 1.4 Market volume regions (Data)
- 1.5 Market volume segments (Data)
- 1.6 Market volume countries (Data)

Country	Segment	Unit	Year	Value
Total	HSR	EURm	2016-2018	XXX
Total	CR	EURm	2016-2018	XXX
Total	Metro	EURm	2016-2018	XXX
Total	LRT	EURm	2016-2018	XXX
Total	Catenary	EURm	2017	XXX
Total	Catenary	CAGR / % p.a.	2017-2022	XXX
Total	Catenary	%	2017-2022	XXX
Total	Traction power supply	EURm	2017	XXX
Total	Traction power supply	CAGR / % p.a.	2017-2022	XXX

3 Market shares

- 3.1 Market shares (Pivot)
- 3.2 Market shares (Data)

Country	Segment	Company	Year	Unit	Value
Total	New development and upgrade		2013-2017	%	XXX
Total	New development and upgrade		2013-2017	%	XXX
Total	New development and upgrade		2013-2017	%	XXX
Total	New development and upgrade		2013-2017	%	XXX
Total	New development and upgrade		2013-2017	%	XXX
Total	New development and upgrade		2013-2017	%	XXX
Total	New development and upgrade		2013-2017	%	XXX
Total	New development and upgrade		2013-2017	%	XXX
Total	New development and upgrade		2013-2017	%	XXX

4 Additional Tables

- 4.1 Project Overview
- 4.2 Additional Figures

Extract from the Study

6 The Market for Railway Electrification in North America

Summary: North America 2017				
	Market volumes by product group			
	Segment	Current market volume [EUR million]	CAGR 2017-2022	Volatility 2017-2022
	Overhead contact line equipment	xx	x%	x%
	Traction power supply equipment	xx	x%	x%
	Total	xx	x%	x%
	Market volumes by investment purpose			
	Segment	Current market volume [EUR million]	CAGR 2017-2022	Volatility 2017-2022
	Renewal and maintenance	xx	x%	x%
	New development and upgrade	xx	x%	x%
	Total	xx	x%	x%
	Market volumes by transport mode			
	Segment	Current market volume [EUR million]	CAGR 2017-2022	Volatility 2017-2022
	HSR transport	xx	x%	x%
Conventional railway	xx	x%	x%	
Metro	xx	x%	x%	
LRT	xx	x%	x%	
Total	xx	x%	x%	

© SCI Verkehr GmbH

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			
High-speed railway network length [route-km]	Conventional railway network length [route-km] / Electrification grade	Light-rail network length [route-km]	Metro rail network length [route-km]
29	323 500 / 1%	1 600	1 700
© SCI Verkehr GmbH			

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

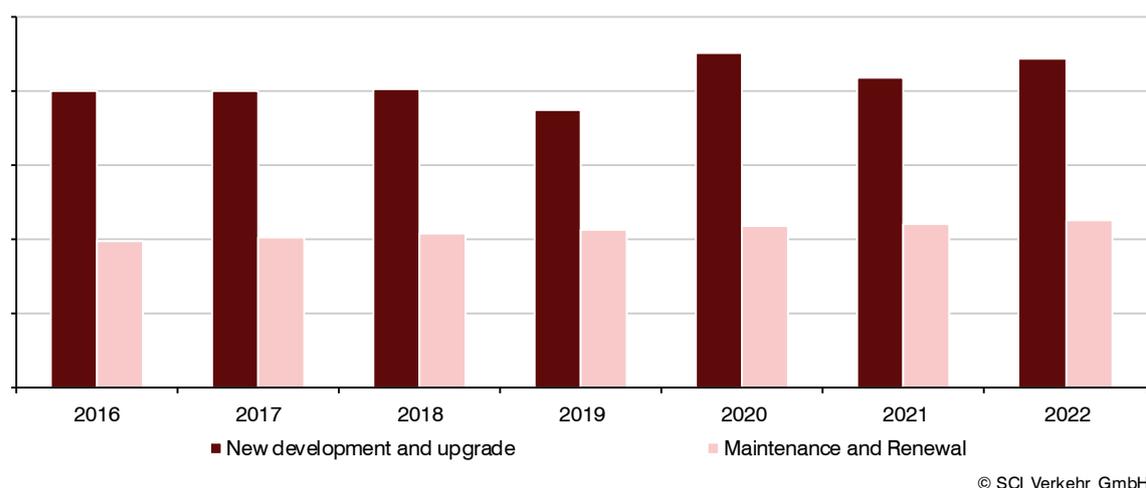


Figure 26: Market volume in North America

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.

**Market shares suppliers electrification 2013-2017
New development and upgrade North America**

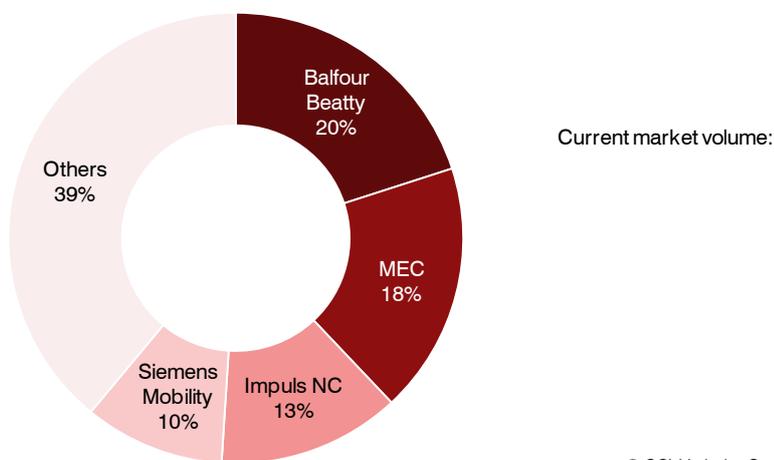


Figure 27: Market shares of electrification suppliers 2013-2017 new development and upgrade in North America

6.2 USA

Profile: USA 2016				
	Socio-economic data			
	GDP	USD 19 362 billion		
	Population	325 million		
	Urbanisation	82 %		
	Rail infrastructure			
	Mainline railway network	246 230 km		
	Degree of railway electrification	1 %		
	Urban transport network	2 680 km		
	Railway electrification market volume in EUR million	Current market volume	CAGR 2017-2022	Volatility 2017-2022
	Maintenance and renewal	xx	x%	x%
New development and upgrade	xx	x%	x%	
Total	xx	x%	x%	

© SCI Verkehr GmbH

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.

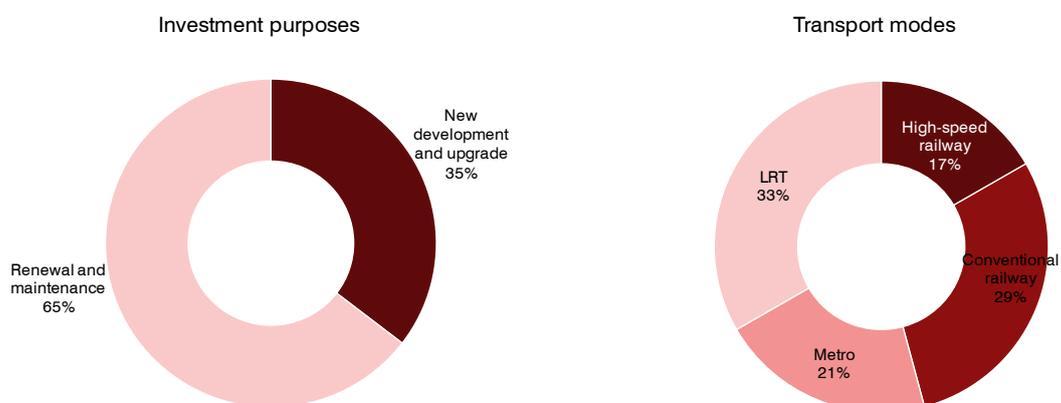
[...]

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



Average total market volume p.a. 2016-2018

© SCI Verkehr GmbH

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

Important new development and upgrade infrastructure projects 2016 to 2022:

Project title	Transport mode	Estimated/announced volume for electrification [in EUR million]	Construction period
HSR Dallas-Houston	HSR	[...]	[...]
[...]	[...]	[...]	[...]
[...]	[...]	[...]	[...]

© SCI Verkehr GmbH

Order Multi Client Study

Railway Electrification –Global Market Trends

Publication date: December 2017

Office Cologne

Alexander Apking
Vor den Siebenburgen 2
50670 Köln
Phone +49 221 93178 20
Fax +49 221 93178 78
E-Mail a.apking@sci.de
www.sci.de

I would like to order the following option:

- PDF file in English for **3,400 €**
- PDF and print file in English for **3,800 €**
- PDF file + data in Excel format in English for **4,900 €**
- PDF and print file + data in Excel format in English for **4,300 €**
- Additional consulting service* for a surcharge of **2,000 €**

Company: _____
Contact person: _____
Position: _____
Street, Number.: _____
Postcode, Town: _____
Country: _____
Phone: _____
Email: _____
VAT Number (EU countries) _____
Other invoice address _____

Date

Signature / Stamp

* In addition to the purchased study, the project manager will be available for one day to present the study or to give in-depth explanations by phone or on-site (plus travel expenses)

All prices exclude VAT

Confirmation of order, delivery of the study document and/or invoice takes place on workdays within 24 hours. We reserve the right to deliver only against advance payment.

The order is subject to the General Terms and Conditions of SCI Verkehr GmbH (dated 08.06.2007, place of jurisdiction is Hamburg) and the terms of use for purchasing MC Studies.



SCI/Verkehr

Büro Hamburg

SCI Verkehr GmbH
Schanzenstraße 117
20357 Hamburg
Tel.: 49 (0) 40 5071970
Fax: 49 (0) 40 50719720

E-Mail: info@sci.de

www.sci.de

Impressum:

© SCI Verkehr GmbH

Büro Köln

SCI Verkehr GmbH
Vor den Siebenburgen 2
50676 Köln
Tel.: 49 (0) 221 931780
Fax: 49 (0) 221 9317878

Büro Berlin

SCI Verkehr GmbH
Wilhelmine-Gemberg-Weg 6
Eingang I
10179 Berlin
Tel.: 49 (0) 30 2844540
Fax: 49 (0) 30 28445420