

2017



DIESEL LOCOMOTIVES – GLOBAL MARKET TRENDS

Forecast, Fleet, Suppliers, Procurement Projects

DIESEL LOCOMOTIVES – GLOBAL MARKET TRENDS

Forecast, Installed Bases, Suppliers, Procurement Projects

Available in English from 20th December 2017.

*Now you can also purchase the **data annex in Excel format** (see overview data sheets on page no. 5 for more information).*

This study entitled “Diesel Locomotives – Global Market Trends” provides a comprehensive overview into the structure, installed bases, procurements, manufacturers and development trends in the rail vehicle segment analysed.

Based on current developments in rail transport, this study, entitled “Diesel Locomotives – Global Market Trends”, delivers an analysis and sound estimate of the market for diesel locomotives. Based on the successful preceding study from 2015 and experience from more than 2,000 projects in the field of railway technology, in the past few years SCI Verkehr has verified the central input data and optimized its forecasting methodology. We have reviewed and updated all chapters of the preceding study.

In concrete terms, this market study of diesel locomotives includes:

- A regionally differentiated look at the worldwide market for diesel locomotives including an in-depth analysis of all relevant markets of the individual countries
- A comprehensive analysis of the current fleet stocks concerning operational purposes, quantities and age structures as well as future procurement potential
- An overview of the most important drivers behind the procurement and refurbishment of diesel locomotives in the individual regions
- Analysis of market shares of manufacturers as well as a forecast of new procurement and after-sales volumes of diesel locomotives (in EUR) for each region up to 2022
- An overview of diesel locomotive manufacturers including a brief description of their current range of products and services
- A condensed presentation of the most important fleet-specific features of diesel locomotives in diagram form

All in all, the study provides a well-founded analysis of the worldwide market for diesel locomotives. 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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CONTENTS

1	Executive Summary: The World Market for Diesel Locomotives	18
1.1	Market Overview.....	18
1.2	Installed base/age structure.....	22
1.3	Manufacturers/Products/Market Shares	25
1.4	Market volume and market development	26
2	Market Delimitation and Methodology of the Study.....	29
2.1	Objective of the Market Analysis.....	29
2.2	Delimitations of the Railway Technology Market	30
2.3	Market Analysis Methodology.....	37
2.4	After-Sales Market Forecast.....	40
3	The Market for Diesel Locomotives in Europe	42
3.1	Germany.....	58
3.2	France	63
3.3	Poland	66
3.4	Italy	69
3.5	Czech Republic	72
3.6	United Kingdom	75
4	The Market for Diesel Locomotives in Asia.....	78
4.1	China	90
4.2	India.....	93
5	The Market for Diesel Locomotives in North America	97
6	The Market for Diesel Locomotives in South/Central America	111
7	The Market for Diesel Locomotives in the CIS.....	124
7.1	Russia.....	135
7.2	Ukraine	141
7.3	Kazakhstan.....	145
8	The Market for Diesel Locomotives in Africa/Middle East.....	148
8.1	Iran	161
8.2	South Africa.....	164
9	The Market for Diesel Locomotives in Australia/Pacific	167



DATA ANNEX IN EXCEL FORMAT

OVERVIEW DATA SHEETS

1 Market Overview

- 1.1 World Market Overview (Pivot)
- 1.2 Network length (Pivot)
- 1.3 Transport Performance (Pivot)
- 1.4 Market Volume (Pivot)
- 1.5 World Market Overview (Data)
- 1.6 Network length (Data)
- 1.7 Transport Performance (Data)
- 1.8 Market Volume (Data)

Transport Performance	Year	2007	2008	2009
<ul style="list-style-type: none"> Rail Freight Transport <ul style="list-style-type: none"> Africa/Middle East Asia Australia/Pacific CIS Eastern Europe North America South America Western Europe Rail Passenger Transport <ul style="list-style-type: none"> Africa/Middle East Asia Australia/Pacific CIS Eastern Europe North America 		XXX	XXX	XXX

2 Installed Base

- 2.1 Installed Base Overview (Pivot)
- 2.2 Installed Base Operator (Pivot)
- 2.3 Installed Base Age (Pivot)
- 2.4 Installed Base Power (Pivot)
- 2.5 Installed Base Overview (Data)
- 2.6 Installed Base Operator (Data)
- 2.7 Installed Base Age (Data)
- 2.8 Installed Base Power (Data)

Product Subsegment	Subcriteria	Unit	Year	Value
ainline	DB AG	Units	2017	XXX
unting	DB AG	Units	2017	XXX
ght Shunting	DB AG	Units	2017	XXX
ainline	Thyssen Krupp	Units	2017	XXX
unting	Thyssen Krupp	Units	2017	XXX
ght Shunting	Thyssen Krupp	Units	2017	XXX
ainline	VPS	Units	2017	XXX
unting	VPS	Units	2017	XXX
ght Shunting	VPS	Units	2017	XXX
ainline	RheinCargo	Units	2017	XXX
unting	RheinCargo	Units	2017	XXX
ght Shunting	RheinCargo	Units	2017	XXX
ainline	EVV	Units	2017	XXX
unting	EVV	Units	2017	XXX
ght Shunting	EVV	Units	2017	XXX
ainline	HVLE	Units	2017	XXX
unting	HVLE	Units	2017	XXX
ght Shunting	HVLE	Units	2017	XXX

3 Deliveries

- 3.1 Deliveries Segment (Pivot)
- 3.2 Deliveries Manufacturer (Pivot)
- 3.3 Deliveries Power (Pivot)
- 3.4 Deliveries Segment (Data)
- 3.5 Deliveries Manufacturer (Data)
- 3.6 Deliveries Power (Data)

Manufacturer	Sum of Units
GE	XXX
DLW	XXX
TMH	XXX
EMD	XXX
CRRC	XXX
Other manufacturers	XXX
GE/KTZ	XXX
Sinara	XXX
Vossloh	XXX
Siemens (Mapna)	XXX
Stadler	XXX

4 Additional Tables

- 4.1 Project Overview (Data)
- 4.2 Additional Figures

Extract from the Study

Market overview


South/Central America		D-Locomotives		Trend
	Installed base	Units 2017	5,400	↘
		Average development 2017-2022 (p.a.)	-0.8 %	
		Average age 2017 (in years)	31	
	Market for new vehicles	Average volume 2016-2018 (EUR million p.a.)	205	→
		Average development 2017-2022 (p.a.)	2.0 %	
		Volatility market volume 2017-2022 (S.D.)	11.9 %	
	Market for after sales	Average volume 2016-2018 (EUR million p.a.)	850	↓
		Average development 2017-2022 (p.a.)	-2.8 %	
		Volatility market volume 2017-2022 (S.D.)	3.6 %	
<p> ↑ Boom/Strong Growth ↗ Small Growth → Stagnation ↘ Small Decrease ↓ Clear Decline </p> <p> Volume: > +5%p.a. +2 to +5% p.a. 0 to +2% p.a. -2 to 0% p.a. <-2% p.a. </p> <p> Installed base: > +1.5%p.a. +0.5 to +1.5% p.a. -0.5 to +0.5% p.a. -1.5 to -0.5% p.a. <-1.5% p.a. </p>				

Figure 1: Market overview diesel locomotives in South/Central America

In the last five years, the market volume for new diesel locomotives fluctuated at a value of about EUR xxx million. The difficult economic situation in the region as well as frequent delay in the extension of rail infrastructure has led to smaller procurements of diesel locomotives in the recent past. Due to current large infrastructure measures in Argentina and Brazil, SCI Verkehr expects an increasing market volume in the long term.

[...]

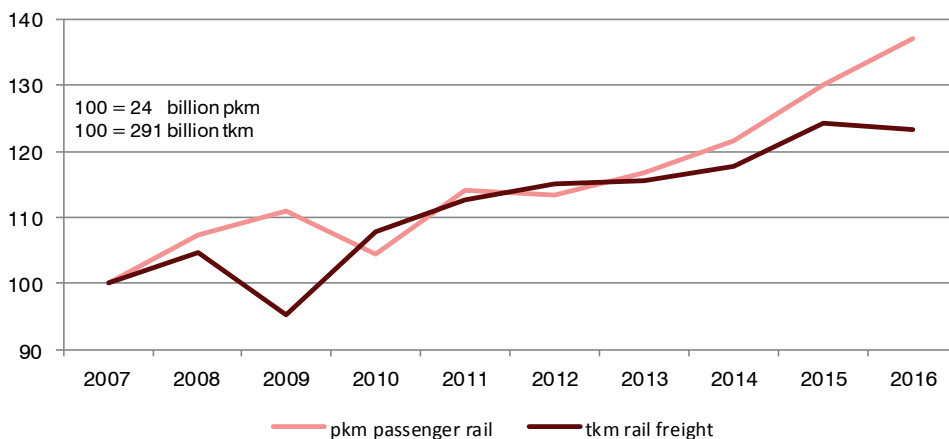
Market environment/transport market

Infrastructure:

Compared to other market regions, the network density in South and Central America is quite low. The highest density can be found in the eastern part of Argentina. Brazil also has a fairly dense network extending from the coastal region towards the inland. Overall, the railway network in South and Central America has a total length of xxx km. The proportion of electrified lines is quite low at only xxx The lead market for diesel locomotives – Brazil – has the second largest railway network at around xxx km, following Argentina’s network of about xxx km. In total, more than ten different track gauges exist in South and Central America. The most important are metre gauge, broad gauge and standard gauge.

[...]

**Development of rail transport services South/Central America
2007 to 2016 [Index 2007 = 100]**



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Figure 2: Rail transport performance and development in South/Central America in the period 2007 to 2016

Rail passenger transport:

[...]

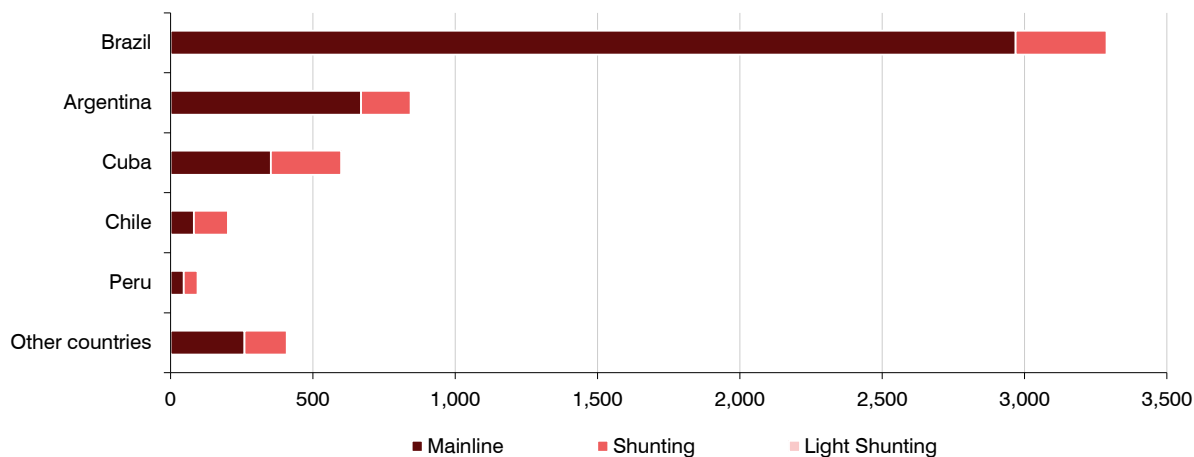
Rail freight transport:

[...]

Installed base/age structure

Diesel traction dominates rail transport services in South and Central America, with more than xxx diesel locomotives, and clearly outweighs the fewer than xxx electric locomotives in this region. Due to the low degree of electrification, electric locomotives are mainly operated for heavy-haul transport for industrial and mining rail lines. Brazil has the largest fleet at about xxx diesel locomotives, followed by Argentina and Cuba. In Argentina, locomotives have increasingly been ordered from Chinese manufacturers in recent years. The installed base in the smaller countries, especially in Central America, is for the most part not transparent, and the number of units in operation have therefore been estimated by SCI Verkehr.

Installed base South/Central America by countries [Number of Units]



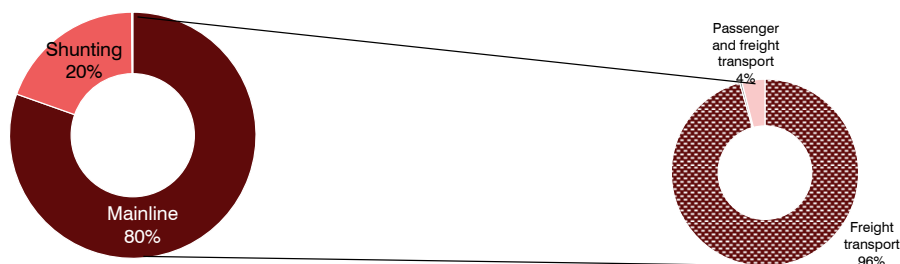
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Figure 3: Installed base overview diesel locomotives in South/Central America in 2017 by country (number of locomotives)

Diesel locomotives in South and Central America are mostly operated in freight transport. The high importance of the freight transport market is also reflected in the fleet structure: more than 95% of diesel locomotives are operated in this segment. More than 47% of all diesel locomotives have more than 2,000 kW power. Only a small share of locomotives is operated in passenger transport.

Fleet segments in South/Central America
[~5,400 diesel locomotives]

Application of mainline fleet in South/Central America
[~4,400 diesel locomotives]



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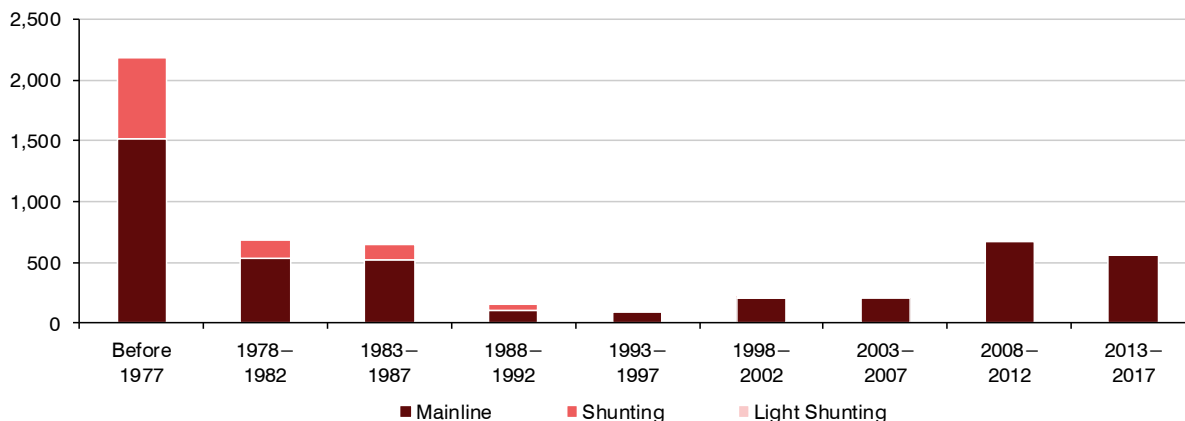
Figure 4: Segments of the diesel locomotive fleet/detail operational fields for mainline locomotives (number of locomotives)

[...]

The diesel locomotive fleet in South and Central America has an average age of around 30 years.

[...]

Installed Base/Age distribution [Number of Units]
South/Central America



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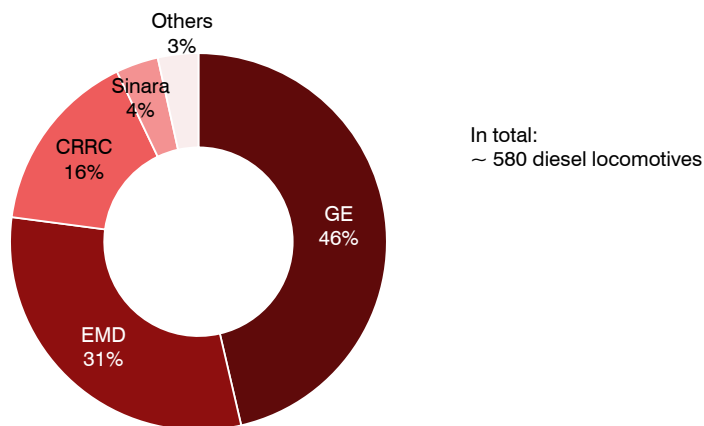
Figure 5: Age structure of installed base in South and Central America (Number of Units)

Manufacturers/Products/Market Shares

While Chinese manufacturer CRRC gained market shares, GE Transportation and EMD remained the most important manufacturers in the South American market in the last five years.

[...]

**Market shares of manufacturers 2013 - 2017
South/Central America**



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Figure 6: Market shares for diesel locomotives in South/Central America in the period 2013–2017 (number of locomotives)

[...]

Market volume and market development

The current market volume for new diesel locomotives is around EUR xxx million p.a.; for after-sales services it is around EUR xxx million p.a.

This market is influenced by the following drivers:

Drivers of procurements	Brief description	Relevance	Trend
Infrastructure	[...]	■■■	[...]
Transport demand	[...]	■■■	[...]
Investment funds	[...]	■■■	[...]
Fleet structure	After a constant increase in the locomotive fleet of Brazilian operators in the last nine years, a fleet reduction was registered. The main driver is the implementation of new locomotives with larger capacity [...]	■■■	↘

Relevance for procurements: ■■■ = very high, ■■■ = high, ■■■ = medium, ■■■ = low, ■■■ = none
 5-year trend: ↑ = strongly increasing, ↗ = increasing, → = constant, ↘ = decreasing, ↓ = strongly decreasing

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[...]

Important current and planned procurement projects

Country	Vehicle type	Units	Power [kW]	Delivery	Remarks
Chile	Freight locoS	12	-	2016	Chilean rail freight operator Ferronor has received 12 diesel locomotives from Australia for its 1,000 mm gauge network. The locomotives will operate on the non-electrified Salta - Antofagasta line that links Argentina and Chile via the Andes. The order is supposed to strengthen international services between ports and mines in Northern Chile and Argentina as well as Central Western South America.
Cuba	TGM8KM	75	882	2017-2021	The Sinara Group has delivered the first shunting locomotive of type TGM8KM from its plant in Ludinovo to Cuban state railway UFC. From 2017 to 2021, a total of 75 shunting locomotives will reportedly be delivered. Moreover, Sinara will undertake maintenance services for the locomotives in Cuba. In addition, Sinara will deliver spare parts as well as maintenance equipment to the depot in Havana. The shunting locomotive of type TGM8KM has been especially designed for the 1,435 mm gauge system as well as the climatic conditions in Cuba. The locomotive has an automatic system for controlling and regulating fuel reserves, detachable body parts which simplify the replacement of spare parts as well as a small home facility with a fridge, a sink, a cooking area and an air-conditioning system.
...

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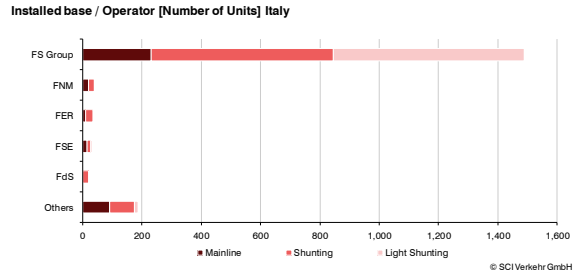
Annex A: Example

R.J. Corman Railpower Locomotives			
Overview			
Head Office:	Erie, USA		
Website:	www.rjcorman.com		
Shareholders:	Richard J. Corman (Founder and Owner) – RJ Corman Railroad Group		
Management:	Edward Quinn III (President and CEO)		
Employees (2017):	1,600 (total group), Railpower Locomotives estimated at around 100		
Turnover (2011):	EUR 230 million (USD 300 million)		
Profit (2015/16):	n/a		
<p>The company was founded in 2001 in Vancouver, British Columbia, and incorporated an automotive propulsion system into a new hybrid yard locomotive, dubbed the "Green Goat." In 2009, Railpower Technologies Corp was sold to RJ Corman Railroad Group. The company was then renamed to RJ Corman Railpower. Based in Nicholasville, Kentucky, the R.J. Corman Railroad Group, LLC is the owner of several business entities serving the rail industry. Started as a railroad construction company in 1973, the R.J. Corman Railroad Group, LLC has grown to include not only railroad construction, but the operation of various shortline railroads, derailment and emergency services locations and locations providing track materials.</p> <p>The portfolio of Railpower includes four-axle locomotives up to 1,000 kW and six-axle locomotives up to 2,000 kW. Particularly the newly developed drive concept for diesel locomotives, with a fuel saving of up to 35%, should create successes in the future. The reduction of emission is estimated at 90%. The company distributes the original total performance of the locomotive to several gensets with the help of several small diesel engines by DEUTZ. As soon as the electric drive engines no longer have to deliver full performance, a special control system switches off the gensets that are not needed at that moment. The gensets can be replaced completely. The company has the EPA certification for the generator set.</p>			
Production sites			
<p>Railpower has no own production halls and awards its production orders to third parties, like the workshops of Norfolk Southern. However, the company controls technologies, tools, and manufacturing processes, quality assurance and test procedures for its locomotives.</p> <p>In 2007 Railpower awarded a production order from the Union Pacific to Super Steel Products Corp. with headquarters in New York.</p>			
Product segments			
Segment	Important products	Market shares (2013–2017)	Market positioning / main contracts
D-loco	RP series	n/a	RP series: The RP series is the successor of the Green-Goat locomotives which are also suitable for light main-line services. The locomotives are equipped with Tier 3 or Tier 4 engines, as multi engine concepts. Locomotives are available with 4- or 6-axle and are equipped with one up to four engines. The power is depending on the number of engines and the engine types between ~450 kW and ~2,000 kW.
© SCI Verkehr GmbH			

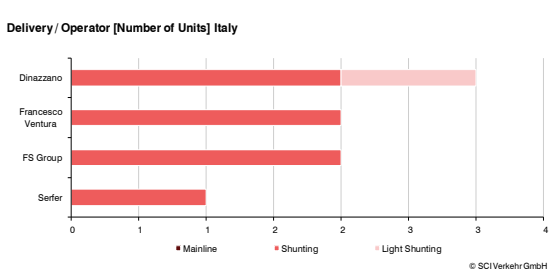
Annex B: Example

Italy

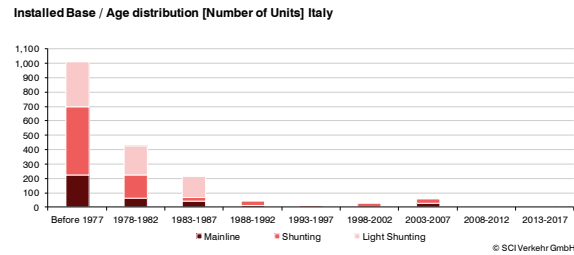
Installed Base / Operator



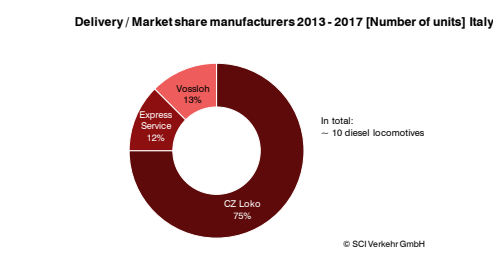
Delivery 2013 – 2017 / Operator



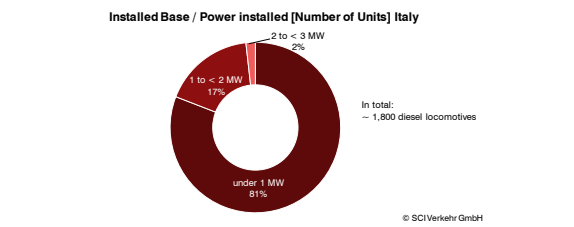
Installed Base / Age distribution



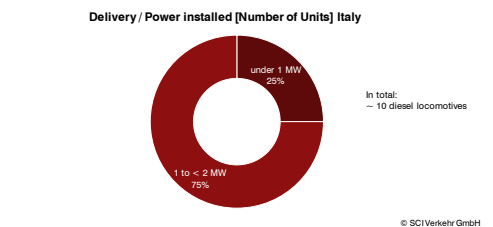
Delivery 2013 – 2017 / Market Shares



Installed Base / Power installed



Delivery 2013 – 2017 / Power installed



Bestellung Multi Client Study

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