Sustainability is an increasingly important issue in global society, and there are growing demands for companies to contribute to sustainable development.

A sustainability report serves as a channel for communication to stakeholders. In this brochure, we have compiled the material concerning our sustainability work for 2016. This information was previously presented in several different places, but we now have the pleasure of presenting an integrated report in which we have brought together all this material in one place. This report is based mainly on social and environmental issues; financial issues are addressed in the Company’s annual report. In this work, we have applied the materiality principle and highlighted areas that we think our stakeholders consider important.

Our future reports will be supplemented with additional information that may be considered material to our operations, that is, as one of the biggest shipping companies on the Baltic Sea.
We are making our debut. This is Viking Line’s first sustainability report, in which we have gathered facts from our operations in order to describe our work for a more sustainable future. We see this as a natural part of our day-to-day operations.

Viking Line’s vision is to be the customer’s preferred choice by offering the best travel experience. To earn our customers’ trust, we must live up to their expectations. We operate in a very sensitive archipelago environment and want to shoulder our responsibilities. At Viking Line, we continuously work to become better at what we do.

We strive to be a company that:
» customers prefer and trust
» has the least possible negative environmental impact
» ensures that as much material as possible is recycled
» has proud employees who enjoy their work

The Baltic Sea and the nature in its archipelagos are close to Viking Line’s heart

The state of the Baltic Sea and its archipelagos have been important to Viking Line for decades. The Group’s actual environmental work began as early as the 1980s in conjunction with the renewal and expansion of its fleet. Thanks to a long-term, active involvement, Viking Line’s environmental work goes beyond regulatory requirements.

We have long set requirements for more environmentally sound technology, implemented fuel-saving programmes and introduced new environmentally sound concepts on board our vessels. We continuously develop our environmental work as part of our day-to-day operations. Our vessels work actively with fuel-saving measures. The current aim is to reduce the overall fuel consumption of our fleet by 2.5% over the next two-year period. An example of our environmental engagement is Viking Cinderella, whose timetable and mechanical performance have undergone long-term optimisation procedures and development of technological solutions. In 2016, the vessel’s fuel consumption was 34% lower compared to 2007.

Another important aspect is the environmentally sound handling of residual products from operations. We can prevent the occurrence of pollution in the Baltic Sea by reducing discharges to water and emissions into the air. We therefore strive to optimize our use of resources. We are increasing recycling and re-use to reduce the amount of waste produced.

Support for Baltic Sea research and partnerships with environmental organizations

Viking Line supports and partners with different environmental organizations, such as the Keep the Archipelago Tidy Association in Finland and the Keep Sweden Tidy Foundation. We also support Baltic Sea research; Finland’s biggest centre for Baltic Sea research and education, the Tvärminne Zoological Station, part of the University of Helsinki, received a
donation of 100,000 euros in May. The station conducts research on biodiversity, ecosystems and the effects of human activities in the Baltic Sea.

**Letter of intent for a new energy-efficient vessel**

Although maritime traffic accounts for 2.7% of the world’s total CO₂ emissions, it is by far the most environmentally friendly mode of transportation. Nearly 90% of world trade is transported by ship.

Viking Grace, which began its operations in 2013, is the world’s first large passenger vessel that runs on liquefied natural gas (LNG). The vessel has met all our expectations and has been a role model globally for the entire shipping industry in terms of its environmental impact.

On November 23, Viking Line signed a letter of intent with the Chinese company Xiamen Shipbuilding Industry Co. Ltd. concerning the order of a new LNG-powered passenger vessel. This should be seen as a collaborative project, in which we will hire a number of Finnish and other European suppliers. We plan to place the new vessel in service on the Turku–Åland Islands–Stockholm route. Along with a large number of environmentally sound solutions, we have placed great emphasis on new innovative energy-efficiency measures. Although the vessel will be larger than Viking Grace, it will be even more energy-efficient.

**Viking Line – above all, a service organization**

Behind our shipping company stands a highly skilled and forward-thinking organization, which I have had the pleasure to lead for almost three years. Since I began my career at this company in 1988, I have met many different people, both on board our vessels and in our offices on land. Our organization consists of a large number of personalities – knowledgeable, humorous and friendly people who have all left their imprint on Viking Line over the years.

Looking ahead, our strength will depend on how well we succeed in maintaining, and further developing, our high level of service. In our 2016 customer survey, we received a mark of 8.98 (on a scale of 4 to 10) for our service on all our vessels. Our aim is to exceed a mark of 9.0 and to be the preferred choice on the Baltic Sea for anyone looking for experiences or efficient transport. This is what drives us to work hard and offer only the highest level of service.

It is with confidence that I look forward to 2017. It will be an exciting year with many new opportunities. We will be celebrating the centenary of Finland’s independence, and in conjunction, we will highlight our environmental commitment. We respect the world around us and the views of our customers, and we prepare for environmental requirements yet to come. We are convinced that a continued interest in sea voyages will persist in the future – this is what drives us to develop more sustainable solutions.

Jan Hanses
President and CEO, Viking Line Abp
A link in the European logistics chain

Since the 1980s, the European Union has made major investments to develop a sustainable transport infrastructure that links together its Member States. Since 2014, the EU has revised its policies for transport infrastructure, with the aim of closing the gaps between the Member States’ transport networks. Finland, Sweden and Estonia are all included in the EU’s so-called transport corridors, which are considered essential in the trans-European transport network. Shipping is crucial in linking together the transport infrastructure of the Nordic countries, the Baltic countries and Central Europe.

The EU advocates an environmentally sustainable future for shipping as part of European transport infrastructure. The realization of this future requires sound political judgment at the national level.

National political decisions affect the operations not only of Viking Line but of the entire Finnish shipping industry. It is important that Finland does not deviate from its current application of European Commission guidelines. After all, maintaining its own fleet helps ensure Finland’s national security of supply.

Did you know that ..

90% of Finland’s exports and 70% of its imports are transported by ship
Our fundamental task is to link together the countries around the northern Baltic Sea by providing sustainable and regular ferry service. Our three basic services are cruises, passenger transport and cargo transport.

Our unique expertise in combining these three basic services generates customer and business benefits. We are the leading brand in our area of traffic, the northern Baltic Sea, and we offer the market’s best value for money by providing good quality at affordable prices.

Three of our fundamental values

» Customers are our top priority. We aim to exceed their expectations, especially with regard to good service. Our selective quality factors are friendly service, fully functional and clean facilities, good food, enjoyable entertainment and attractive shopping.

» We respect our co-workers and value initiative, innovation, teamwork, openness, honesty, loyalty and acceptance of responsibility. We motivate and train our employees to achieve improved quality, service and productivity.

» Our vessels are safe and well-maintained. We strive to continuously improve our environmental and sustainability work and conduct our operations in compliance with applicable environmental standards and legislation.

Viking Line is for everyone

Our selective quality factors are friendly service, fully functional and clean facilities, good food, enjoyable entertainment and attractive shopping.
This is Viking Line

1959

start of traffic

1959-2016
213 million passengers
21 million cars
4 million cargo units

33.5%
market share in 2016

2,982 employees in 4 different countries

6,502,191
passengers in 2016
The fleet consists of 7 vessels: M/S Rosella, M/S Viking XPRS, M/S Mariella, M/S Gabriella, M/S Amorella, M/S Viking Grace and M/S Viking Cinderella.

Sales EUR 519.6 M (2016)

The shares of the parent company, Viking Line Abp, have been listed on the NASDAQ Helsinki since July 5, 1995. The wholly-owned subsidiaries Viking Line Skandinavien AB and its subsidiary, Viking Rederi AB, OÜ Viking Line Eesti, Viking Line Finnlandverkehr GmbH and Viking Line Buss Ab belong to the Viking Line Group.

The Company’s management consists of the Board of Directors, the President and Chief Executive Officer, and the Group management team. In his absence, the President and CEO is replaced by the Deputy CEO. The President and CEO works with the Group management team appointed by the Board of Directors. Viking Line applies the Finnish Corporate Governance Code, which was approved by the Securities Market Association. Viking Line’s Corporate Governance Statement and other information about Viking Line’s corporate governance are available on Vikingline.com.
Viking Line had an interesting year in 2016. Passenger volumes were stable despite intense competition. We continued to modernize our fleet. The culmination of the year was a letter of intent to purchase a brand-new, energy-efficient vessel.

Several major dry-dockings were carried out during the spring – Viking Grace, Amorella and Gabriella all underwent dry-docking. Along with investments in safety and maintenance, the dry-docking work included a large number of improvements and modernizations.

We operate in three segments

Passenger traffic
Viking Line offers pleasure cruises and ferry service in comfortable vessels with pleasant cabins, a wide range of restaurants, entertainment and affordable shopping. Each year, more than 6 million people choose to travel with us across the Baltic Sea.

Cargo transport
Viking Line Cargo is an important player in the Nordic import and export market, offering sea freight transports, stevedoring and other shipping services to cargo customers on routes between Finland, the Åland Islands and Sweden as well as between Finland and Estonia.

Bus traffic
Viking Line Buss Ab is a wholly-owned subsidiary of Viking Line that provides bus service in the Åland Islands as well as for tourist traffic. The Company owns twelve buses.

Viking Line operates on the following routes:
» Turku–Åland Islands–Stockholm with Viking Grace and Amorella
» Helsinki–Tallinn with Viking XPRS
» HHelsinki–Mariehamn–Stockholm with Mariella and Gabriella
» Stockholm–Mariehamn with Viking Cinderella
» Mariehamn–Kapellskär with Rosella

6.5 million passengers annually
**Viking Line’s passengers in 2016 came from:**

<table>
<thead>
<tr>
<th>Route</th>
<th>2016</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turku–Åland–Stockholm</td>
<td>1,884,441</td>
<td>1,939,807</td>
<td>1,935,958</td>
</tr>
<tr>
<td>Stockholm–Mariehamn</td>
<td>892,253</td>
<td>919,087</td>
<td>860,243</td>
</tr>
<tr>
<td>Helsinki–Mariehamn–Stockholm</td>
<td>994,046</td>
<td>1,021,145</td>
<td>1,063,027</td>
</tr>
<tr>
<td>Finland/Sweden–Baltic countries</td>
<td>2,031,224</td>
<td>2,001,276</td>
<td>2,044,340</td>
</tr>
<tr>
<td>Mariehamn–Kapellskär</td>
<td>700,227</td>
<td>687,369</td>
<td>706,578</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>6,502,191</strong></td>
<td><strong>6,568,684</strong></td>
<td><strong>6,610,146</strong></td>
</tr>
</tbody>
</table>

Did you know that...

In 2016 6,330,977 cups of organic coffee were served on our vessels.

**Picture:**

- **Finland**
  - 52.8%
- **Sweden**
  - 31.5%
- **Other countries**
  - 15.7%
Economic value generated and distributed

Viking Line’s operations generate economic value for the Group’s stakeholders in the countries and market areas in which Viking Line operates. The most important cash flows consist of revenue from our customers, purchases from suppliers of goods and services, salaries to employees, payments to and from the public sector, dividends to shareholders, and funding costs to financiers.

In 2016, consolidated sales and other revenue totalled 527.0 million euros. The Group’s purchases from suppliers totalled 322.5 million euros, and investments totalled 15.8 million euros. Viking Line employed an average of 2,742 people. Net salaries and pension expenses totalling 117.7 million euros were paid to employees. Viking Line paid a total of 82.8 million euros to the public sector in the form of public harbour costs and vessel fees, taxes on salaries, social security contributions and income taxes. The Group received restitution from the Finnish and Swedish states totalling 38.0 million euros for shipboard employees’ taxes and social security contributions. Shareholders were paid a total of 4.3 million euros in dividends. The Group’s income statement, balance sheet and cash flow statement are presented in their entirety in Viking Line’s annual report, which is available on the Group’s website, Vikingline.com.

Distribution of economic value, breakdown

- Suppliers EUR -322.5 M
- Other stakeholders EUR -171.3 M
- Investments EUR -15.8 M
- Revenue EUR 527 M
- Amount remaining for development of operations EUR 17.3 M
### Generation and distribution of economic value, 2016

<table>
<thead>
<tr>
<th></th>
<th>EUR M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customers</td>
<td>527.0</td>
</tr>
<tr>
<td>Suppliers</td>
<td>-322.5</td>
</tr>
<tr>
<td>Investments</td>
<td>-15.8</td>
</tr>
<tr>
<td>Economic value generated by Viking Line</td>
<td>188.6</td>
</tr>
</tbody>
</table>

#### Distribution of economic value

<table>
<thead>
<tr>
<th></th>
<th>EUR M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>-117.4</td>
</tr>
<tr>
<td>Shareholders</td>
<td>-4.3</td>
</tr>
<tr>
<td>Financiers</td>
<td>-4.5</td>
</tr>
<tr>
<td>Public sector</td>
<td>-0.1</td>
</tr>
<tr>
<td></td>
<td>-40.2</td>
</tr>
<tr>
<td></td>
<td>-42.8</td>
</tr>
<tr>
<td>Public sector, total</td>
<td>-83.0</td>
</tr>
<tr>
<td>Restitution from public sector</td>
<td>38.0</td>
</tr>
<tr>
<td>Public sector, net</td>
<td>-45.1</td>
</tr>
</tbody>
</table>

#### Economic value distributed, total

<table>
<thead>
<tr>
<th></th>
<th>EUR M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic value distributed, total</td>
<td>-171.3</td>
</tr>
<tr>
<td>Amount remaining for development of operations</td>
<td>17.3</td>
</tr>
</tbody>
</table>

### Other stakeholders, distribution of economic value

<table>
<thead>
<tr>
<th></th>
<th>EUR M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>117.7 M</td>
</tr>
<tr>
<td>Shareholders</td>
<td>4.3 M</td>
</tr>
<tr>
<td>Financiers</td>
<td>4.5 M</td>
</tr>
<tr>
<td>Public sector</td>
<td>83.0 M</td>
</tr>
<tr>
<td>Restitution from public sector*</td>
<td>-38 M</td>
</tr>
<tr>
<td>Economic value distributed</td>
<td>171.3 M</td>
</tr>
</tbody>
</table>
Restitution from the public sector

Restitution is a repayment of social security contributions and withholding tax for shipboard employees. Viking Line gets back taxes on salaries and social security contributions paid to the public sector in accordance with EU Guidelines on State Aid and the net salary systems that countries such as Finland, Sweden and Denmark use in order to maintain maritime traffic under Nordic flags. This restitution is recognized as state aid in Finland, but not in Sweden or in Denmark. Restitution should not be seen as state aid, since the shipboard employees themselves generate what is paid. Restitution ensures that Finnish and Swedish maritime salaries remain competitive.
Viking Line is Finland’s biggest maritime employer
We safeguard domestic nautical skills.
We ensure the security of supply for logistics transport in Finland.
We ensure that employees working in our territorial waters are skilled and have experience with winter weather conditions and archipelago traffic.
Customers are the highest priority

For the third straight year, Viking Line was named the shipping company providing the best service on the Baltic Sea based on the Swedish customer survey ServiceScore 2016. During the year, we focused on an even greater extent on the value, activities and customer service that passengers experienced on board.

With tougher competition and greater transparency in the market via the Internet, it has become even more important to be clear about why people should sail with Viking Line. Friendly service, good food, professional entertainment and affordable shopping are the four cornerstones of Viking Line’s activities on board.

We work continuously to update and improve our fleet of vessels. In 2016, extensive upgrades on Viking Grace, Amorella, Gabriella and Rosella were carried out, with a focus on the on-board experience. Among the new features are more comfortable cabins, better spa experiences and an expanded, modern range of restaurant options.

One Service – our new service platform
With the new One Service platform, we have mobilized our resources to take what is a good customer experience one step further. All Viking Line employees should feel that they are part of the Group’s ‘Good Hospitality’ – the shared foundation of values for how we should treat each other, our customers and our partners.

The objective is to create even more satisfied customers, who will choose to sail again on Viking Line, by providing consistent, friendly and accommodating service, internally and externally, across all borders and professional categories.

On the digital forefront
As a player that changes with the times, we are leading development among Baltic Sea shipping companies. Viking Line was the first to launch a digital app, which among other features allows customers and passengers to see the duty- and tax-free products available, the daily activities programme for each vessel and opening hours as well as enabling them to communicate with one another via the social chat function and get an overview of all the restaurants and other facilities on board.

All Viking Line employees should feel that they are part of the Group’s ‘Good Hospitality’

Feeling safe and secure on board
For Viking Line, the safety and security of our passengers on board our vessels is always our top priority. Preventive safety and security work is a key element of the Group’s organization for safety and security operations. We are constantly making improvements, and employees get continuing training on a regular basis. This training is provided both by the Company and in collaboration with relevant authorities.

More than 227 different nationalities sailed on our vessels in 2016

Customer satisfaction in 2016 was 8.9 out of 10
Our good food, shopping and entertainment shall make Viking Line the best on the Baltic Sea.
More than 5 million in 4 years

After four years in traffic, Viking Grace is expected to reach the 5 million passenger mark during the first quarter of 2017.

Amorella and Viking Grace sail daily between Turku, Mariehamn and Stockholm. Day cruises are a popular choice, either from Turku to Mariehamn with Amorella and back to Turku med Viking Grace, or from Stockholm to Mariehamn with Viking Grace and returning with Amorella to Stockholm.

Viking Grace has attracted considerable attention globally as the first large passenger vessel in the world to operate on liquefied natural gas (LNG).

Did you know that...
In August 2016 Viking Grace celebrated its 1,000th LNG fuelling

Expanded capacity to Tallinn

Estonia is one of the most popular destinations from Helsinki, cruise sailings and regular route traffic Tallinn peak during the summer. Despite tough competition on the route, Viking Line increased its passenger volume during the summer.

Viking XPRS is tailor-made for traffic across the Gulf of Finland, with a travel time of two and a half hours. The additional summer sailings with Mariella and Gabriella also allow short day trips from Helsinki to Tallinn. The day cruises take six hours, and passengers do not go ashore. Meanwhile, this increased capacity provided more space for cars, for which there is great demand in scheduled service to Tallinn.

Mariella and Gabriella made a total of 116 sailings between Helsinki and Tallinn from June 18 to August 14, 2016. During this period, we made a total of 348 sailings between Finland and Estonia.
Viking Line Buss, a wholly-owned subsidiary of Viking Line, provides bus service both on local routes and for tourist traffic and is based in Åland. In 2016, two buses were added to the Viking Line Buss fleet, which means the company now owns twelve buses.

Viking Line Buss is part of Åland’s transport infrastructure. In 2016, our three city buses operated their scheduled routes in Mariehamn. Our nine rural buses operated scheduled routes across Åland. Viking Line Buss also offers a large range of day trips to Sweden, cultural excursions to elsewhere in the Nordic countries and Europe, trips to theatre performances and trade fairs, ski trips and charter service for group travel.

Environmental and safety work
Viking Line Buss is certified in compliance with ISO 14001 environmental management standards. This certification means that there is continuous improvement of environmental work in the company as well as an increased awareness among the staff. The drivers are skilled, with many years of experience driving in European traffic. Each year, they carry out training exercises for slippery road conditions, braking and traffic safety, and all employees undergo continuing in-house training in first aid and safety.

Wi-Fi is available in all buses

Did you know that…
Viking Line Buss generated about 10,000 passengers for Viking Line’s vessels through its charter service…
Viking Line transported 131,918 cargo units in 2016.

The cargo organization has some 20 employees in Helsinki, Turku, and Tallinn.
Viking Line Cargo operates in a highly competitive freight market which is dominated by big international transport companies. Our most important competitive strengths are a high level of quality, good service, long-term thinking and continuity. We take pride in maintaining a close dialogue with our customers.

Viking Line Cargo is a key player in the transport of Nordic imports and exports. Our service enables large flows of goods between the Nordic and Baltic countries. With cargo transports, Viking Line can maximize use of the vessels’ car decks so that we always utilize as much of our capacity as possible. It is a matter of allocating space between passenger and cargo units so that we satisfy our customers while achieving the highest possible level of capacity utilization.

Two service areas
The Finland–Estonia market has grown steadily for many years, but there is still excess capacity, which means tough price competition among market players. Finland–Sweden cargo traffic has remained at a very stable level for many years. In 2016, we saw signs of a slight increase in demand.

Freight links between three countries

High capacity utilization = more sustainable maritime transport
Maritime transport is an important link in the large flows of goods between the Nordic and Baltic countries. Viking Line Cargo provides reliable international service to customers with daily scheduled maritime transport. Our aim is to achieve high capacity utilization on our car decks on every departure.

Key figures

<table>
<thead>
<tr>
<th>Units transported</th>
<th>2016</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargo units</td>
<td>131,918</td>
<td>133,163</td>
<td>129,255</td>
</tr>
<tr>
<td>Cars</td>
<td>682,194</td>
<td>649,327</td>
<td>634,433</td>
</tr>
<tr>
<td>Buses</td>
<td>16,577</td>
<td>16,490</td>
<td>16,588</td>
</tr>
</tbody>
</table>
Our personnel

Land-based and shipboard personnel

Land-based personnel
- 210 temporary staff
- 695 permanent staff

Shipboard personnel
- 400 temporary staff
- 1,677 permanent staff

Breakdown by age
- < 30 years: 14%
- 30–50 years: 49%
- > 50 years: 37%

Land-based and shipboard personnel in the Viking Line Group on December 31, 2016: 2,982
Average number of employees in the Viking Line Group (full-time equivalents): 2,742
In addition to the Group’s own personnel, Viking XPRS was staffed by 250 people employed by a staffing company.
Percentage of women and men

**Total**

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>47.5%</td>
<td>52.5%</td>
<td>100%</td>
</tr>
<tr>
<td>Board of Directors</td>
<td>1</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Group management team</td>
<td>0</td>
<td>5</td>
<td>5</td>
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</tbody>
</table>

**Land-based personnel**

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>351</td>
<td>258</td>
<td>609</td>
</tr>
<tr>
<td>Sweden</td>
<td>116</td>
<td>66</td>
<td>182</td>
</tr>
<tr>
<td>Estonia</td>
<td>88</td>
<td>24</td>
<td>112</td>
</tr>
<tr>
<td>Germany</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Shipboard personnel**

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finnish flag</td>
<td>697</td>
<td>951</td>
<td>1,648</td>
</tr>
<tr>
<td>Swedish flag</td>
<td>164</td>
<td>265</td>
<td>429</td>
</tr>
<tr>
<td>Employed by the Group</td>
<td>1,417</td>
<td>1,565</td>
<td>2,982</td>
</tr>
</tbody>
</table>
The Group’s management and corporate functions are divided into the main areas of Accounting, Finance, IT, Legal Affairs and Land-Based Personnel; Sales and Marketing; Commercial Shipboard Operations and Shipboard Personnel; and Marine Operations and Newbuildings. Apart from Sales and Marketing, all the functions are located in Mariehamn.

As a link between the corporate functions for marketing, commercial shipboard operations and the different vessel organizations, there are route-specific product groups. The operation and management of each vessel are overseen by a vessel management team, consisting of the master, chief engineer, chief officer, passenger services director and purser.

The Finland, Baltic and Russia units, which handle Sales and Marketing in the respective areas, are managed from Helsinki, with booking and sales offices in Helsinki, Turku, Tampere and Tallinn. The Sweden and International units, which handle Sales and Marketing in Sweden, Germany and other countries, are managed from Stockholm, with booking and sales offices in Stockholm and Lübeck. Cargo sales are managed from Helsinki, with booking and sales offices in Helsinki, Turku and Tallinn.

Viking Line has its own harbour terminals in Stockholm and Turku. In Helsinki, Mariehamn, Kapellskär and Tallinn, the premises required for terminal operations are leased.

**Shipping boosts prosperity in smaller communities**

For natural reasons, the majority of our land-based employees reside close to our market units and terminals. However, among shipboard personnel, the geographic spread is much wider. We have employees who live in Lapland north of the polar circle, in the archipelago communities of Åland and Turku, in the east close to the Russian border, in the Estonian countryside and in Sweden near the Norwegian border.

The personnel on our vessels work in shifts, with one week on/one week off or ten days on/ten days off. These extended periods of time off enable them to live away from densely populated areas. With such labour arrangements, shipping companies help to preserve the population structure in smaller communities and ensure that tax revenue goes to other regions besides densely populated areas. The hiring by shipping companies of some of these residents may be crucial to small archipelago communities located far from urban areas.

Along with traditional maritime jobs in operation and maintenance, Viking Line also provides jobs in other areas on board its vessels: in restaurants, shops, kitchens, hotels, entertainment, conference facilities, security and health care, to name a few. In all, more than 40 different occupational categories are employed on a vessel.

**Our land-based and shipboard organizations**
Where our employees live
Pleasant, safe work environment

Viking Line strives to always improve the work environment so that employees enjoy their work and are stimulated. Our occupational health and safety operations shall maintain a safe, healthy work environment that promotes good mental and physical health for all of the Company’s employees.

We want to prevent occupational injuries, reduce absence from work due to illness, and work actively with rehabilitation as early as possible. Our occupational health and safety operations are regulated by the Company’s employee protection policy as well as the laws and regulations in effect.

The overall objective for work with occupational health and safety at Viking Line is to guarantee a work environment where our employees do not run the risk of ill health or accidents.

**Occupational health and safety operations**

In recent years, we have encouraged our employees to report all workplace accidents, even minor incidents. In our work with occupational health and safety, we strive to gather all information pertaining to accidents in order to be able to analyze their cause. The objective is to prevent all kinds of workplace accidents, both severe and minor.

Encouraging incident reporting has yielded results, especially among shipboard personnel, and we have had more reports submitted than previously. For shipboard personnel, we noted that a majority of workplace accidents (75%) and accidents during their time off (63%) in 2016 were minor accidents that did not lead to absence from work. Reporting even minor incidents is beneficial to the risk analyses and causal analyses that are carried out in our work with occupational health and safety. It helps us to be aware of and prevent recurring risks going forward.

**Continuous risk analyses**

Viking Line has carried out 319 risk analyses on its vessels since 2010 in order to systematically identify the risks arising from work, the workplace, the workplace environment in general and labour relations in vessel operations.

Our risk analyses are updated as needed, for instance, after major renovations on board our vessels or when a change in operations entails new work procedures. Other factors that can have an effect are new working tools, new machinery that changes the ergonomics of the workplace, serious accidents in the workplace and minor accidents that occur frequently on the job.

**Electronic reporting system**

An electronic system for reporting incidents is available to shipboard personnel for identifying problems that can affect safety and security. Among the things reported in the system are accidents, technical deviations and near-misses. The contents of these reports are shared between all vessels, who may then take measures to prevent recurrences.

**Key figures 2016 2015 2014**

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<thead>
<tr>
<th></th>
<th>2016</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of shipboard employees*</td>
<td>2,084</td>
<td>2,066</td>
<td>2,133</td>
</tr>
<tr>
<td>Accidents reported for shipboard employees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On the job</td>
<td>301</td>
<td>258</td>
<td>229</td>
</tr>
<tr>
<td>During their time off</td>
<td>134</td>
<td>147</td>
<td>146</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>434</td>
<td>405</td>
<td>375</td>
</tr>
<tr>
<td>Causing an absence from work (% of accidents)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 days</td>
<td>75</td>
<td>71</td>
<td>72</td>
</tr>
<tr>
<td>1 – 6 days</td>
<td>7</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>7 – 30 days</td>
<td>13</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>&gt; 30 days</td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Causing an absence from work (% of accidents during their time off) **</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 days</td>
<td>63</td>
<td>38</td>
<td>34</td>
</tr>
<tr>
<td>1 – 6 days</td>
<td>0</td>
<td>26</td>
<td>8</td>
</tr>
<tr>
<td>7 – 30 days</td>
<td>25</td>
<td>9</td>
<td>44</td>
</tr>
<tr>
<td>&gt; 30 days</td>
<td>12</td>
<td>27</td>
<td>14</td>
</tr>
</tbody>
</table>

* Viking XPRS and Viking Cinderella crews are not included in these statistics.
** Accidents during an employee’s time off while on board the vessel are included in the statistics.
Viking Line began giving priority to occupational health and preventive measures a long time ago. Occupational health projects are implemented based on the different conditions or requirements in each unit.

In the Swedish land-based organization, work began on the so-called Health Portal, which focused on the workplace environment. People worked together to identify key concepts that create a pleasant workplace, which included involvement, cooperation, happiness and praise. New measures to promote employee wellness were developed, and all this occupational health work was determined to be one component of leadership.

Viking Health project in Åland
Similarly, the Åland land-based organization invested in the Viking Health project, where we work with a local partner in occupational health services to link together our employee survey, occupational health services, workplace inspections and employee wellness programme. We thus gain a better overall assessment of “the Company’s health”, also knowing that this working method is emphasized in the occupational health guidelines developed by the Finnish Institute of Occupational Health and the Social Insurance Institute of Finland.

KIVA programme in Finland
A variety of wellness activities are arranged for land-based personnel in Helsinki under the so-called KIVA (“Happiness together in Vikings’ daily work”) programme. During the year, employees took part in different campaigns and lectures to promote good health. The KIVA programme will continue in 2017.

Focus on occupational health
Safety and security are top priority

Viking Line is responsible for the safety and security of both passengers and employees and takes every measure to create a safe and secure journey for each passenger. Through its cooperation with various government authorities and through international regulations such as SOLAS, STCW, ISMC, MARPOL and ISPS, the Group carries out systematic work to identify potential risk situations and thus prevent accidents.

Viking Line’s objective is to ensure that all passengers and employees feel safe and secure on board its vessels and in its terminals. Safety and security efforts are based on operating vessels in compliance with the prevailing regulations and standards, both national and international, as well as through close internal monitoring and regulatory oversight. Processes and procedures as well as the shipboard and land-based organizations are all developed on a continuous basis through the Group’s safety and security management system.

We continuously invest in training staff in risk management and prevention. The combination of well-trained staff and modern technology makes for the best conditions for a safe and secure environment.

Employees’ skills crucial to safety and security
In 2016, an extensive training project was carried out to ensure that the crews’ skills comply with the Manila amendments to the 1978 International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers (STCW) adopted in 2010. This consisted mostly of in-service training and refresher courses, to maintain up-to-date basic and specialist competencies.

Safety and security exercises are conducted on board on a continuous basis
This is done both as customized training and as full-scale exercises. Crew members train in collaboration with one another to ensure preparedness for carrying out specific safety and security duties. These exercises are conducted so that they meet the vessel’s needs and comply with current norms and requirements.

Major full-scale exercises
During the spring and autumn of 2016, full-scale exercises were carried out on Viking Grace and Amorella in Turku with the Finnish Border Guard’s vessels and helicopters and the national rescue authority’s Maritime Incident Response Groups (MIRGs). The Red Cross provided a large number of simulated victims, greatly enhancing the value of the exercises.

Other vessels also carried out scheduled, full-scale exercises during the year.

The safety organization on board
The master of the vessel carries the main responsibility for safety on board, and all crew members have been well trained in their safety organization duties.

The crew is divided into groups with different areas of responsibility, such as evacuation, first aid, fire-fighting and information. It is mandatory for all employees to take part in safety exercises, which are arranged on a regular basis.

The land-based organization is also prepared for emergency situations and can assist the vessels in taking care of passengers and crew members. This organization performs its duties in accordance with an emergency response plan.

Safety procedures checked on every departure
Maritime authorities inspect the vessels and check their safety procedures at least once a year. Before every departure, the ship’s officers go through a checklist to verify that the vessel is seaworthy. Among other things, they make sure that hatches, doors and ramps are securely shut and that all navigation instruments are operational.

During the voyage, safety and security monitoring is provided both by electronic surveillance systems and by guards making regular rounds.

Security guards and medical orderlies
Security guards are on duty around the clock on the vessels, and there are trained medical orderlies on board except on the short Marie-
hamn–Kapellskär route, but qualified staff is available on this route in case of an accident or illness.

The vessels’ sickrooms are outfitted with special equipment to provide care in a medical emergency. If necessary, emergency ambulance transport will be arranged from the first port of arrival to the closest hospital. In the event of more severe cases, helicopter transport or an evacuation boat will be arranged.

In the event of emergency or crisis situations, Viking Line collaborates with the Red Cross in Finland and Sweden.

**Important cooperation in emergency situations**

Viking Line maintains continuous cooperation with maritime rescue organizations, fire brigades, police, customs, border control authorities and national emergency response forces. This cooperation is very important in order to quickly and efficiently obtain adequate information during any emergency situations, but also to increase understanding between authorities and vessels.

In partnership with the Finnish Border Guard, including the Maritime Rescue Coordination Centre (MRCC Turku), we conduct simulator exercises in maritime rescue operations as well as conventional rescue exercises with the national rescue authority’s Maritime Incident Response Groups (MIRGs). Training with the Finnish Border Guard’s vessel and helicopter units is also carried out in conjunction with these exercises. MIRGs are specially trained rescue groups, whose most important task is to assist passengers and crew members in case of incidents or accidents at sea.

Viking Line also collaborates with community groups, government authorities and other shipping companies to ensure broad agreement on maritime safety issues. One such effort is NORDKOMPASS, a Nordic forum for passenger ship owners whose objective is to collaborate on various maritime safety issues in Nordic passenger ship operations.

**Mutual Trust**

Mutual Trust is a bilingual, three-year project to improve cooperation between rescue authorities, organizations for people with impairments and technical experts. Viking Line is taking part in the project in order to further improve its preparedness capabilities in potential rescue situations.

Mutual Trust conducts joint exercises with groups representing people with impairments and rescue authorities. Based on these exercises, an information bank is created for people with impairments as well as for rescue authorities. We want to do our share to improve current practice and assistive devices.

The project is administered by the Finnish disability organization Finland’s Svenska Handikappförbund and funded by Finland’s Slot Machine Association. The Finnish president, Sauli Niinistö, serves as the project’s patron.

The vessels’ lifeboats can hold up to 150 people
Divers have brushed the bottoms of our vessels since the 1980s.
Our environmental work

Viking Line is working to ensure that the Baltic Sea and its valuable archipelagos are conserved for future generations. For many years, we have set stringent requirements for more environmentally sound technology, implemented fuel-saving programmes and introduced new environmentally sound concepts on board.

National legislation and international agreements serve as the basis for the Group’s environmental work. The most extensive set of environmental protection regulations is the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), which was devised by the International Maritime Organization (IMO), a United Nations agency. At Viking Line, we have pro-actively developed our environmental work for many years so that today we do more than international agreements and national laws require of us. We work intensely with an in-house programme to reduce exhaust gas emissions through energy efficiency measures. In this programme, vessel operating staff and the Group’s technical department are working to introduce new fuel-efficient operating methods, install new and more energy-efficient technology, reduce the vessels’ hydrodynamic resistance and recover energy.

All of Viking Line’s vessels, the Group’s head office and the subsidiary Viking Line Buss Ab are certified in compliance with ISO 14001 environmental management standards. Viking Line’s organization and all its vessels are also certified according to the International Safety Management (ISM) Code, which stipulates organizational rules for safe vessel operation and for preventing pollution.

We shoulder our responsibility on a number of levels; in 2016, Viking Line donated 170,000 euros to fund environmental protection measures for a cleaner Baltic Sea.

Regular environmental audits
The independent certification body DNV GL performs yearly external audits of the environmental management system in order to verify compliance with the established objectives. In addition, the Finnish, Swedish and Estonian regulatory authorities perform continuous ISM Code-related audits connected to both safety and environmental work.
Environmental awareness on board

Viking Line carries out environmental work in all operations on board its vessels. For instance, we choose organically grown coffee as part of our efforts to conduct environmentally responsible procurement. In 2016, as many as 6,330,977 cups of organic coffee were served on board our vessels.

The Food Garden restaurants on Viking Line vessels no longer offer table water in plastic bottles. Instead, the restaurants serve purified tap water from environmentally themed reusable glass bottles. This has a number of environmental benefits – it reduces the need to transport bottles of water as well as the quantity of single-use bottles in shipboard waste.

When purchasing the seafood that is served on board our vessels, we keep to the Swedish Environmental Management Council’s list of sustainable fish and shellfish stocks. The purchase and use of chemicals are also governed by internal environmental standards. Environmentally friendly alternatives are always used as far as possible.

Specially developed cleaning agent for cabins
Viking Line worked in partnership with KiiitoClean Oy to develop a new general cleaning agent for the cabins on board our vessels. The cleaning agent is environmentally certified and complies with our environmental policy. It has a mild scent and is easy to rinse, which reduces shipboard water usage. The finished product that we use on board today is called Kiiito Total Fresh.

In cleaning the vessels’ cabins and kitchens, we use a special dosage device that mixes concentrated cleaning agent with water according to pre-established criteria. By controlling the dosage, we have managed to reduce the use of both water and cleaning agent. We also use cleaning materials made of microfibre to further reduce the use of cleaning agent and water.

Water
Because we aim to further reduce water use on board our vessels, we have implemented a number of measures along with the development and dosage of cleaning chemicals. They include the installation of electronic sensor taps as well as water-saving shower heads and taps in passenger cabins and public lavatories. All vessels have vacuum toilets and waterless urinals installed in the public lavatories.

Different kinds of wastewater are produced on board the vessels. The largest quantities consist of grey water and black water. The vessels can choose to either clean the black water on board and discharge it into the sea together with untreated grey water, or pump out all wastewater ashore.

Viking Line’s vessels do not discharge any wastewater into the sea. Everything is pumped ashore to municipal wastewater treatment plants, which are far more effective than the treatment systems available for on-board use. As a result, this puts less of a strain on the Baltic Sea.

Black water contains nitrogen, and grey water contains phosphorus. Both nutrients contribute to eutrophication, that is, an excessive fertilization of the sea. Black and grey water also contain organic matter that requires large quantities of oxygen to decompose. The result of this decomposition is low oxygen levels in the sea.

Bilge water, which is water containing oil, is produced in conjunction with the cleaning of machinery or internal leakages. Since the autumn of 2004, Viking Line’s vessels have pumped all bilge water ashore.

Energy
Shipping is a relatively energy-efficient transport mode. Comparisons with other means of transport show that energy use per transported tonne of goods/km is usually lowest for shipping. However, the combustion of fuel in vessel engines still produces exhaust gas emissions.

Fuel consumption is highly proportionate to the distance travelled. It is also affected by weather, ice conditions, route planning, the vessel’s trim, speed regulations and the vessel’s electric power and energy efficiency. Preventive engine maintenance is also important to ensure a high level of operational efficiency.

In 2016, the fleet’s consumption of diesel oil fell by 1.2% (992 tonnes), and LNG fell by 3.4% (520 tonnes). This reduced consumption is mainly the result of ongoing energy efficiency and savings measures but was also affected by somewhat longer service interruptions due to scheduled maintenance.

Viking Line’s vessels do not discharge any wastewater into the sea

Did you know that...
...a vessel generates three main kinds of wastewater – grey water from showers and other washing activity, black water from toilets, and bilge water that is separated from water in engine rooms and contains traces of oil.
Key figures

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passengers</td>
<td>6,502,191</td>
<td>6,568,684</td>
<td>6,610,146</td>
</tr>
<tr>
<td>Cars</td>
<td>682,194</td>
<td>649,327</td>
<td>634,433</td>
</tr>
<tr>
<td>Cargo units</td>
<td>131,918</td>
<td>133,163</td>
<td>129,255</td>
</tr>
<tr>
<td>Total distance (km)</td>
<td>1,130</td>
<td>1,138</td>
<td>1,141</td>
</tr>
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</table>

Resource consumption

<table>
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<th></th>
<th>2016</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel oil (tonnes)</td>
<td>79,709</td>
<td>80,701</td>
<td>87,060*</td>
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<tr>
<td>Lubricating oil (m³)</td>
<td>648</td>
<td>620</td>
<td>744</td>
</tr>
<tr>
<td>Urea (m³)</td>
<td>446</td>
<td>284</td>
<td>211</td>
</tr>
<tr>
<td>Fresh water (m³)</td>
<td>327,059</td>
<td>331,736</td>
<td>335,185</td>
</tr>
<tr>
<td>LNG (tonnes)</td>
<td>14,960</td>
<td>15,480</td>
<td>15,951</td>
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</table>

Emissions (tonnes)

<table>
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<tr>
<th></th>
<th>2016</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen oxides (NOx)</td>
<td>3,144</td>
<td>3,218</td>
<td>3,684</td>
</tr>
<tr>
<td>Sulphur oxides (SOx)</td>
<td>75</td>
<td>76</td>
<td>433*</td>
</tr>
<tr>
<td>Carbon dioxide (CO₂)</td>
<td>283,109</td>
<td>286,797</td>
<td>307,853</td>
</tr>
</tbody>
</table>

Residual products (tonnes)

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2015</th>
<th>2014</th>
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<tbody>
<tr>
<td>Solid waste for combustion</td>
<td>2,959</td>
<td>3,138</td>
<td>3,025</td>
</tr>
<tr>
<td>Waste sent to landfills</td>
<td>143</td>
<td>158</td>
<td>210</td>
</tr>
<tr>
<td>Waste for recycling</td>
<td>1,491</td>
<td>1,565</td>
<td>1,321</td>
</tr>
<tr>
<td>Biowaste</td>
<td>1,022</td>
<td>1,042</td>
<td>958</td>
</tr>
<tr>
<td>Hazardous waste</td>
<td>55</td>
<td>67</td>
<td>70</td>
</tr>
</tbody>
</table>

Wastewater pumped ashore (m³)

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grey and black water</td>
<td>292,528</td>
<td>294,364</td>
<td>298,066</td>
</tr>
<tr>
<td>Bilge water</td>
<td>7,795</td>
<td>8,423</td>
<td>7,468</td>
</tr>
<tr>
<td>Waste oil (m³)</td>
<td>1,943</td>
<td>2,506</td>
<td>2,314</td>
</tr>
</tbody>
</table>

* Beginning in 2015, the fleet switched to fuel with a lower sulphur content (0.1% by weight), in compliance with the European Union’s sulphur directive.
Our vessels are able to operate their tight schedules thanks to quality maintenance work. The crews work actively to cut energy and water use and reduce the production of residual waste. Every little bit helps to produce major energy savings and environmental benefits over time.

One small measure such as pre-portioned desserts on the buffet tables has significantly reduced food waste in our restaurants. We offer our guests as wide a selection as before but serve the dessert items in convenient, appetizing portions. Other benefits besides less waste are that the food looks more appetizing and can be kept chilled and served as needed.

We give priority to the energy-efficient alternative when broken equipment is replaced. A few examples – when lights are replaced on board our vessels, the aim is to replace all fluorescent tubes with LED bulbs. In our kitchens, we have installed induction ovens, which generate heat quickly and only as needed. Induction technology also means less heat for people working in the kitchens.

We take advantage of as much free heating and cooling as we can. Sea water has long been used to cool ventilation air. More exhaust gas boilers have been installed on our vessels. They take advantage of waste heat generated by fuel combustion to heat ventilation air, among other things, as needed.

The right timetable saves energy
Timetable optimization is one of the biggest measures to save fuel on a continuous basis. By finding the most suitable speeds, developing harbour logistics and determining departure and arrival times, we have been able to optimize sailing and thus fuel consumption.

The greater the resistance, the greater the energy use
We undertake a number of measures in order to reduce the water resistance on our vessels. Over the years, a number of both large and small improvements have been made to the vessel hulls, propellers, rudders etc., which have had beneficial effects on water resistance. One of the unseen culprits when it comes to energy use is the vegetation that quickly covers the bottom of a vessel during warm periods. Since we have decided to use non-toxic paint on the vessel bottoms, our vessels must be brushed regularly to get rid of the undesired flora and fauna. Waste from brushing the bottoms of vessels is processed and used, among other things, for biogas.

Shore-side electricity
Mariella and Gabriella plug into shore-side power grids during their stops in Stockholm and Helsinki, respectively. By connecting the vessels to the power grids ashore, we avoid keeping the engines running during our harbour stays. This prevents disruptive noise and saves large quantities of fuel.

New fuel cell system being tested on Mariella
In partnership with MEYER WERFT GmbH & Co. KG, a fuel cell system has been installed on board Mariella, which serves as a test facility under the scope of an EU research project. The fuel cells convert methanol to clean electricity, which is fed into the vessel’s electrical network. No air pollutants such as sulphur oxides, nitrogen oxides or particulate matter are created by the process.

The system consists of twelve fuel cell modules with a total capacity of 60 kW.

Climeon technology generates emission-free electricity
Viking Line has an agreement with the Swedish innovation company Climeon related to their unique Ocean Marine energy recovery system. Viking Grace was the first vessel to use Climeon’s patented technology, which recycles heat into electricity through a unique vacuum process. Waste heat from the vessel’s engines is converted into 700,000 kWh of clean, emission-free electricity per year. The electricity is used mainly for hotel operations, such as interior lighting.

Did you know that…
by using shore-side electricity in 2016 we saved
578 tonnes of fuel on Gabriella and
404 tonnes on Mariella.
If consumed in regular service, the amount of fuel would correspond to about 3,100 tonnes of CO₂ emissions. In 2017, we hope to introduce shore-side electricity for Rosella on the vessel’s overnight stay in Mariehamn.

Every little bit helps
Reduced nitrogen oxide emissions
A number of measures have been taken to reduce nitrogen oxide emissions from Viking Line’s vessels. The most important are:

» The installation of SCR catalytic converters on all of Viking Cinderella’s engines, which have reduced nitrogen oxide emissions by about 97%.

» Humid air motor (HAM) technology, which is another method to reduce NOx emissions. HAM technology is installed on Mariella’s main engines, reducing her nitrogen oxide emissions by 75 to 85%.

» Viking Grace is fuelled by LNG, which reduces the vessel’s nitrogen oxide emissions by about 85%, compared to marine diesel.

Diesel oil reduced sulphur emissions
Sulphur dioxide is formed in the combustion of fuel containing sulphur. The emission level is determined by the fuel’s sulphur content.

In late 2014, all of Viking Line’s vessels except Viking Grace switched to diesel oil with a sulphur content of less than 0.1% by weight, in order to meet the requirements of the International Maritime Organization and the European Union’s Sulphur Directive, which entered into effect on January 1, 2015. Until then, the vessels in question operated on low-sulphur oil with a 0.5% content by weight.

Viking Grace runs on LNG, which is sulphur-free, but the diesel that is used in the combustion process contains small quantities of sulphur.

LNG emits 25% less carbon dioxide
The amount of carbon dioxide formed in combustion is determined by the amount of fuel used and therefore cannot be affected by the quality of the fuel or any treatment process – only by the vessel’s energy efficiency.

When a vessel runs on liquefied natural gas, or LNG, carbon dioxide emissions are about 25% lower than when using oil as a vessel fuel. However, some methane emissions are produced in conjunction with the combustion of LNG (methane is considered a greenhouse gas), so the total reduction in greenhouse gases is about 15%.

Nitrogen oxides (NOx):
Nitrogen oxides is an umbrella term for nitric oxide and nitrogen dioxide, which form when oxygen in the air and nitrogen react at high temperatures. Nitrogen oxide emissions are thus closely linked to combustion processes. Nitrogen oxides are toxic and also damage the ozone layer together with organic pollutants (Swedish Environmental Protection Agency).

Sulphur oxides (SOx):
Sulphur dioxide is a colourless gas that causes coughing. It is produced in the burning of fossil fuels and other materials containing sulphur but also through natural processes, such as volcanic eruptions. Sulphur dioxide is oxidized in the atmosphere and forms sulphuric acid, which contributes to acidification (Swedish Environmental Protection Agency).

Carbon dioxide (CO2):
The main cause of global warming is the change in the chemical composition of the atmosphere caused by humans through the emission of greenhouse gases, primarily carbon dioxide. Greenhouse gases enhance the ability of the atmosphere to capture and recycle energy emitted by the Earth’s surface, thereby reinforcing the so-called greenhouse effect (Swedish Environmental Protection Agency).
From food waste to biogas

All waste generated on board is brought ashore for recycling, re-use, incineration, depositing in landfills, composting or other form of waste handling by approved parties. Viking XPRS and Viking Grace have equipment for efficient sorting and collection of biowaste. On Mariella, all biowaste is collected in receptacles.

The vessels’ biowaste is transported to a digestion plant for the production of biogas. Biogas production does not increase the carbon dioxide content in the atmosphere or contribute to the greenhouse effect. Biogas is therefore referred to as carbon-neutral.

In 2016, Viking Line delivered 1,022 tonnes of food waste for biogas production from Viking XPRS, Viking Grace and Mariella. That produced 77,000 cubic metres of biogas, which is equivalent to 87,000 litres of petrol.

Reduced waste quantities
Our strategy for vessel waste management has developed in the direction of preventing waste production and promoting recycling and re-use of the waste produced. Waste is handled in line with the vessels’ waste management plans and schedules. Viking Line only has agreements with approved waste transport companies.

Glass, cardboard, paper, metal, aluminium cans, plastic, cooking oil, biowaste, hazardous waste, energy waste, wooden waste and electronic devices are recycled. All waste oil is brought ashore for recycling.

Concrete measures have been taken to reduce waste quantities. There are recycling centres in the harbours, which facilitates sorting waste in the harbour since the quantities of waste can more easily be organized and documented right there.

Viking Line aims to set requirements for its suppliers so that the quantity of packaging material is reduced to a minimum. Sorting waste on board has been found problematic, since the vessels have varying facilities and technical conditions for waste storing and handling.
Recycled from our vessels, 2016

18 tonnes of plastic
equivalent to a 32-tonne reduction in CO$_2$ emissions – comparable to driving 170,240 km on a motorway

8 tonnes of aluminium
equivalent to an 80-tonne reduction in CO$_2$ emissions – comparable to driving 425,600 km on a motorway

1,943 tonnes of used oils
equivalent to a 3,400-tonne reduction in CO$_2$ emissions – comparable to driving 18,088,000 km on a motorway

464 tonnes of glass packaging

77 tonnes of scrap metal

687 tonnes of paper and cardboard
Viking Cinderella—a good example

Viking Cinderella is a brilliant example of how we have dramatically reduced energy consumption and emissions through a mix of measures and investments both big and small. Our employees’ great dedication has been crucial to this success.

Since 2007, fuel consumption on Viking Cinderella has fallen 34.4%. Measured year on year, that is equivalent to a decrease of 4,524 tonnes of fuel consumed or 13,211 fewer tonnes of CO₂ emissions in 2016.

Decreased consumption in 2016 compared to 2007

- Main engines: 2,504 tonnes or 37%
- Auxiliary engines: 1,623 tonnes or 30%
- Boilers: 418 tonnes or 41%
- Total: 4,524 tonnes or 34%

What we’ve done

In 2016, a large number of fluorescent tubes were replaced with LED bulbs. Most recently, we switched the corridor lighting on board to LED spotlights, which generate great energy savings. Further savings have been achieved by adapting ventilation flows to our needs so that heating and cooling can be regulated in a smarter way. Now we no longer need to heat or cool the entire ventilation system but can instead blow warm or cool air specifically to where it is needed.

We have invested in frequency converters to control the fan motors in the ventilation system in order to optimize their effect. It is in essence a matter of using the amount of energy required for temporary needs.

To further reduce energy consumption on Viking Cinderella, we plan to replace all fluorescent lighting with LED fixtures, install frequency controls for fans and pumps in the machine room and introduce time controls for floor heating in the bathrooms.

Reduced energy use can also create problems

Since we have succeeded in cutting our energy use to such a great extent, we have unintentionally created problems for ourselves. The Group’s policy stipulates that, for safety reasons, we must always operate our vessels with two engines running. The auxiliary engines, which generate electricity for on board use, currently operate on such a low load that they are not particularly efficient. The load on Viking Cinderella’s auxiliary engines is at times too low even for just one engine, which leads to lower fuel efficiency.

We are now assessing the possibilities of installing back-up battery systems in order to potentially operate with fewer auxiliary engines. If the project is a success, we will achieve further energy savings.
The energy-efficient 
Viking Grace

The nitrogen oxide emissions from Viking Grace are about 85% lower compared to vessels using marine diesel oil. Viking Grace is the first passenger vessel of its size and class in the world to run on LNG.

Running on sulphur-free liquefied natural gas produces fewer toxic emissions than marine diesel oil. Nitrogen emissions and particulate matter are reduced by about 85%, and greenhouse gases are cut by roughly 15%. Sulphur emissions are virtually zero. The shape of the vessel hull is hydrodynamically optimized to minimize wake wash, the result of extensive research and development work. The vessel’s highly efficient propulsion technology generates great energy savings. So do its efficient ventilation units, in which air flow varies depending on both outdoor and indoor temperatures. The engines have exhaust mufflers adapted to specific sound frequencies, which means the vessel has low noise levels.

High energy efficiency contributors
Heat on board Viking Grace is recovered from engine exhaust gases, as well as cooling water and air conditioning. The vessel has well-insulated windows, and the its lightweight construction contributes to overall energy efficiency. The on-board lifts are powered about 30% by their own brake energy. Most of the lightning on board is LED technology, which is used in all entertainment settings and in 90% of the vessel’s public spaces.

More than one thousand LNG bunkerings
In August 2016, one thousand LNG bunkerings (fuellings) had been carried out in partnership with AGA Gas AB. The bunkering vessel M/S Seagas supplies Viking Grace with more than 60 tonnes of LNG when the vessel is moored at Stadsgården in central Stockholm.

Seagas is the first vessel of its kind in the world and is classified according to the same regulations as ocean-going LNG tankers. There continues to be great interest in Seagas, its bunkering solution and LNG as a marine fuel both in our service area and in the rest of the world.
Viking Line strives to act responsibly for the environment on several levels. We have a long-term approach to our work on environmental issues and on improving the condition of the Baltic Sea. We want to emphasize the benefits of working directly with environmental organizations since their efforts are focused on achieving visible and concrete results in the local environment. In 2016, Viking Line donated 170,000 euros to fund environmental protection measures for a cleaner Baltic Sea.

Part of the proceeds from the sales of plastic bags in the Group’s on-board shops is donated to environmental work in the Baltic Sea. In March 2016 Viking Line was able to donate 35,000 euros each to two environmental organizations, the Keep Sweden Tidy Foundation and the Keep the Archipelago Tidy Association in Finland. Among the activities to be funded are information campaigns and the installation of recycling centres and lavatories in the Baltic archipelagos.

100,000 euros to Baltic Sea research
In 2016, Viking Line donated 100,000 euros to the University of Helsinki, which is Finland’s largest centre for research and teaching on the Baltic Sea. Among the activities this donation will help fund is the Tvärminne Zoological Station, which is maintained by the university in close collaboration with the Stockholm University Baltic Sea Centre. The station conducts research on topics such as biodiversity, ecosystems and the effects of human activities on the Baltic Sea.
The condition of the Baltic Sea is gradually improving, and the long-term task of reducing nutrient emissions is starting to yield results. But there is still a great deal to be done, so it is extremely important that the university has funding for basic research. Researchers are still trying to determine how various phenomena such as eutrophication, climate change, ocean acidification and fishing affect the ecosystem.
1980s:
End of using toxic paint for the bottoms of vessels. Beginning of brushing of vessels’ bottoms.
Beginning of recycling on board the vessels.

1990s:
Switch to fuel with low sulphur content (< 0.5% by weight).
Grey and black water is pumped ashore to municipal wastewater treatment plants.
Dosage devices reduce the use of chemicals on board (1999).
Sea water is used to cool ventilation air.
Exhaust gas boilers are installed and used to heat ventilation air.

2000s:
Catalytic converters installed on Viking Cinderella (2003).
Recycling of biowaste begins on Viking XPRS (2008),

2010s:
Frequency converters installed to control pumps and fans (2010).
Liquefied natural gas used to power Viking Grace (2013).
Mariella and Gabriella equipped with electric mooring systems both in Stockholm and Helsinki (2012).
Switch to fuel with lower sulphur content (< 0.1% by weight) (2015).
Climeon energy recovery system converts heat to electricity on Viking Grace (2016).
Smarter control of ventilation on Viking Cinderella (2016).