and dry bulk. These pose challenges for the ports in terms of handling technology and in relation to the various shapes, weights, volumes and batch sizes, as well as in terms of storage, safety regulations and the required transport modes. In light of the ever-changing goods and product sizes/weights, the processes at an all-purpose port must be structured in a sophisticated manner and, from a digitalisation standpoint, usually offer significant optimisation potential. The idea behind UniPort 4.0 is to apply digitalisation in a comprehensive manner at the various ports involved.

Artificial intelligence and machine learning

With its artificial intelligence (AI) initiative, HHLA is pursuing three key business aims: alongside new sources of revenue and increased customer loyalty, the initiative also seeks to boost productivity and throughput at the terminals. HHLA also feels that AI offers considerable potential when it comes to increasing occupational safety among the workforce.

The first AI pilot project was successfully completed in 2019: AI-based forecasts of container collection times result in increased yard productivity. The collection time of a container is a key factor in optimising yard operations, even though the dwell time of the container is often not known when it arrives at the yard. This situation occasionally results in unnecessary restacking. In a bid to optimise block storage, an algorithm was developed to forecast container dwell time. It is based on historical data but continuously optimises itself using cutting-edge machine learning methods. Further AI-based projects are to be implemented in future in order to leverage additional optimisation potential at various stages of the value chain.

Performance certified

In order to document their performance, the Container Terminals Altenwerder (CTA) and Tollerort (CTT) once again completed certification in accordance with the Container Terminal Quality Indicator (CTQI) in the reporting year. The standard, which was developed by the Global Institute of Logistics and Germanischer Lloyd, checks criteria such as the safety, performance level and efficiency of a terminal on both the water and onshore, as well as its links to pre- and onward-carriage systems. With their successful certification, the terminals once again confirmed their high levels of performance and compliance with all quality standards.

Purchasing and materials management

Purchasing is a shared service provided by the HHLA Group's management holding company in Hamburg. HHLA Group purchasing supports corporate strategy by means of its professional management of procurement activities. The aim is to establish a consolidated supplier base that is characterised by maximum value added, top quality and optimum life cycle costs.

The strategic purchasing function supports and advises Group companies as part of its holistic management of product groups, suppliers and contracts so that the service and performance requirements of internal customers are met as completely as possible. Market developments relating to new technologies, innovations and the service performance of specific suppliers are considered in close cooperation with the operations and technology departments. In this regard, the purchasing department ensures that all Group requirements for the procurement processes are observed in accordance with the framework guidelines. These guidelines are binding for all employees.

In order to develop viable future solutions for port infrastructure, HHLA remains committed to its strategic and collaborative partnerships with selected suppliers while taking into account both economic and ecological aspects. Products, facilities and processes are systematically enhanced in order to increase the degree of digitalisation. When selecting partners, great importance is attached to reliability, quality, innovative strength, cost structure, economic stability, sustainability and compliance. Compliance with these criteria is monitored by an IT-based supplier management system. All suppliers undergo this process, especially potential new suppliers. This also facilitates a continuous internal assessment. Strategic suppliers are evaluated annually by their internal customers and departments. The evaluations include experience on first contact as well as information about project procurement and processes. As a further enhancement, the details provided are processed in a new "key figures cockpit", which, for example, plays a key role when preparing for negotiations.

HHLA is continuing to drive the automation of purchasing processes for day-to-day requirements. In the reporting period, 32.9 % of all purchasing processes were handled fully automatically by means of e-procurement systems (previous year: 25.2 %). This enables us to streamline processes and ensure both non-bureaucratic procedures and compliance with process standards. By systematically continuing these optimisation and automation measures, further automation potential is expected for the 2020 financial year. These steps will enable us to drive the further strategic alignment of our purchasing activities.

HHLA's supply chains comprise capital goods (such as port handling equipment) as well as consumables and other services (such as maintenance). The overwhelming majority of suppliers are from Germany and other European countries. In 2019, equipment and energy accounted for 29.2 % of the Group-wide procurement volume, while information technology (IT) accounted for 14.5 %, construction for 26.7 %, MRO (maintenance, repairs and operations) for 13.9 %, and other indirect services for 15.7 %. The total managed purchasing volume amounted to approximately € 198 million.

Due to its expertise in the procurement of a vast array of heavy machinery and other equipment, the purchasing department helped achieve significant optimisation even outside its managed purchasing volume.

A project launched in 2018 to optimise the department's strategic alignment was systematically continued, with the ongoing support of an external partner. Following a review of existing structures and processes in 2018, the focus in 2019 was placed on the Group-wide harmonisation and restructuring of selected procurement processes. Purchasing employees are working together with the consultants in various project groups in order to achieve the targets set. An ongoing training and development programme which involves all department staff and takes account of the varied requirements is designed to harness, foster and expand their knowledge and experience in the best possible way.

With regard to the defined initiatives, one notable example is the optimisation of fuel purchasing, where processes and purchase costs have been sustainably improved through the use of a VMI concept ("vendor managed inventory").

A further result of the programme is an instrument for identifying and presenting the value added by the purchasing department, which was developed by the employees themselves and has been established within the department. This instrument was used to document the results of key procurement projects.

Sustainable performance indicators

Direct and indirect energy consumption by HHLA and its companies were as follows in the year under review.

Direct and indirect energy consumption and supply

	2015	2016	2017	2018	**2019**
Diesel, petrol and heating oil in million liter	26.3	26.6	27.4	28.4	28.0
Natural gas in million m^3	2.3	2.4	3.6	4.4	8.0
Electricity[1] in million kWh	138.3	139.6	135.6	135.9	123.2
thereof from renewable energies	76.1	73.2	82.8	78.9	78.7
Traction current in million kWh	130.3	150.0	157.5	181.4	185.0
District heating in million kWh	3.2	3.6	3.6	3.7	3.6
District heating supply[2] in million kWh	–	–	–	10.9	33.3

Consumption of natural gas, traction current and district heating in 2019 is based on preliminary and estimated figures.

1 Electricity without traction current

2 Generated by a highly efficient combinded heat and power generation plant (CHP) based on preliminary figures

For more information about sustainability, please refer to the Sustainability section of the Annual Report.

Non-financial report

HHLA reports on the Group and HHLA AG in the form of a combined separate non-financial report, the contents of which are integrated into the Sustainability section. The non-financial report is also available as a separate PDF from the download centre for the online Annual Report: https://report.hhla.de/non-financial-report

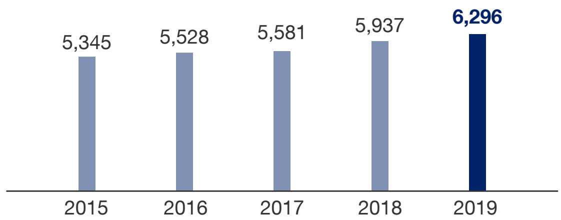
Employees

Development of headcount

HHLA aligns headcount planning with the economic development of its companies. It aims to provide the majority of its services using in-house staff. Employees of Gesamthafenbetriebs-Gesellschaft (GHB) are used by the container handling firms in Hamburg to cover peaks in operating manpower requirements. The recruitment processes used by the individual companies of the holding company are monitored by the HHLA manpower planning team. Proposals to create additional jobs are examined for their consideration of economic planning and operational necessity as well as other options for filling positions internally or taking alternative action. This ensures that recruitment does not exceed the HR planning for individual companies approved by the Executive Board and can be synchronised with headcount trends at the other firms with the possibility of synergy effects.

Employees at the HHLA Group

as of 31.12



HHLA had a total of 6,296 employees at the end of 2019. This figure rose by 359, or 6.0 %, compared to the previous year. The increase is chiefly attributable to the recruitment of new staff in the Intermodal segment. In addition, HHLA used an annual average of 753 employees of Gesamthafenbetriebs-Gesellschaft (previous year: 760).

Employees by segment

In the Container segment, the number of employees rose to 3,186 as of 31 December 2019. Total headcount was up by 52 year-on-year in the reporting period (previous year: 3,134). This represents an increase of 1.7 %. Due to the expansion of services and the increase in vertical integration, headcount in the Intermodal segment also rose by a further 241 employees in total to 2,243 (previous year: 2,002). Employee numbers in