

kaPP

HEAT TRANSFER ENGINEERS

Sustainability report 2025

WE ARE KAPP

We are a team of heat transfer engineers with comprehensive expertise in all types of heat exchangers and their applications across various industries.
From initial design and planning to the final production and construction, we take care of every aspect of the process, never settling for less. We offer the best solution to your problem.
Becoming proficient in any field requires a combination of common sense and technical expertise. In our industry, it's essential to have a thorough understanding of our products, the market, and its specific requirements. However, possessing this knowledge is not sufficient. To become true specialists, we must have experience and the mental agility to apply it repeatedly. At Kapp, we use our knowledge and experience daily and we focus on heat transfer only, which has given us a significant advantage over our competitors. We are proud to use this advantage to benefit our clients and the environment.

Our mission is to drive the energy transition by revolutionizing our clients' processes and projects.

- **Knowhow**
  We know all about heat transfer, heat exchangers and the various industries we serve. Therefore, we know the market's questions and requirements inside out.
- **Guarantee**
  Every project aims to provide the best conceivable solution at the best conceivable price. We always give a 100% process guarantee on our designs.
- **Impact**
  Saving energy also means saving costs, but above all, we see it as our duty to contribute to a cleaner world.

At Kapp, we care about the environment. From our heat exchange systems to our offices and vehicles, we continuously strive to operate as sustainably as possible.



INTRODUCTORY WORDS FROM OUR DIRECTOR

"By integrating heat recovery solutions into our projects, we contribute to improving energy efficiency and reducing our customers' carbon emissions."



JEROEN VAN RUITENBEEK - DIRECTOR

The year 2025 marked my first year as Managing Director of Kapp Nederland B.V. It has been a challenging year for many of our customers and the industries they operate in. High energy costs have put pressure on businesses, making new investments more difficult, and we have unfortunately seen several industrial plants close their doors.
At the same time, rising energy costs have made energy efficiency more important than ever. They have also strengthened the business case for investments in energy savings and carbon emission reductions. Throughout the year, we have actively supported our customers in identifying and realising these opportunities. Some projects focus on achieving immediate energy savings, while others are aimed at delivering long-term improvements. Both are essential steps towards a more energy-efficient and sustainable industry.

We are proud to present our Sustainability Report for 2025. This report provides an overview of our sustainability efforts, performance and key milestones throughout the year. We reflect on the past year and explore a range of topics, including energy consumption, emissions and innovation. Through the application of heat transfer technology, we help our customers recover and reuse energy that would otherwise be lost. By integrating heat recovery solutions into our projects, we contribute to improving energy efficiency and reducing our customers' carbon emissions.

In this report, we also present our own carbon footprint and outline our ambitions and goals for the years ahead. We hope you find this report both informative and inspiring.

Together, let's contribute to a more sustainable future.

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KAPP AT A GLANCE (2025)

Energy use

31,983 kWh
net bought electricity

41,098 kWh
used for our electric vehicles

14,488 kWh
solar power generated (minus direct usage)

8,070 kWh
solar power generated energy fed to home battery

9,131 kWh
fed back to the grid

Our own consumption

1,029 kg
company waste generated

396 kg
paper waste generated

0.376 metric tonnes CO_2
within scope 1 & 2

Technology conversion

67 projects
with significant material use reduction realised

934 metric tonnes
material (steel) reduced versus conventional technology

1,868 metric tonnes
CO_2 emissions diverted

Employees

16 employees
with a mean tenure of 12 years

60 hours
of professional development on average per employee

Heat recovery projects

33
heat recovery projects

65.8 MW
additional heat recovery realised

0.52 TWh
total additional annual heat recovery from projects realised

116,700 metric tonnes
estimated CO_2 diverted for clients (gas)

ENERGY & EMISSIONS

Commitments

Every year, we strive to reduce our carbon footprint and achieve lower emissions than in the previous year.
In 2021, we began measuring and quantifying our scope 1, 2 and 3 emissions as part of our commitment to transparency and continuous improvement. Since then, we have taken several steps to minimise our environmental impact. These include transitioning to a fully electric company car fleet, installing solar panels and a home battery, and applying our expertise in heat exchanger technology to improve energy efficiency. We continuously monitor our emissions to track our progress and identify opportunities for further improvements.

In addition to measuring our own emissions, we also quantify the energy savings and emission reductions that our solutions enable for our customers. This provides valuable insight into the positive impact our projects can have on energy consumption and carbon emissions.

Company vehicles

One of our key achievements in reducing scope 1 emissions is the transition to a fully electric company car fleet. Our last petrol-powered company car has now been replaced, meaning that all company cars are fully electric. Going forward, employees will only be able to select from fully electric models as their company car.

Energy storage

This year, Kapp installed a home battery at the office. The battery acts as a smart energy storage system, storing excess electricity generated by our solar panels as well as electricity purchased from the grid during periods of lower prices.

The stored energy can then be used during peak-rate hours, helping us reduce electricity costs and make better use of our own renewable energy. The battery can also provide backup power in the event of a grid outage.

Scope 3

Our scope 3 emissions arise from activities throughout our value chain that are not directly under our control. As Kapp is primarily an engineering and project-oriented company, these emissions are mainly associated with business travel, employee commuting, waste generation and the services and products we purchase.

We monitor these activities to better understand our indirect environmental impact and identify opportunities for improvement.

Alongside measuring our own scope 3 emissions, we separately assess the energy savings and emission reductions enabled by our heat recovery solutions. This allows us to gain a better understanding of both our environmental footprint and the positive contribution we make to our customers' sustainability efforts.

Impact ambition

In 2015, the United Nations set up the Paris Agreement. The ultimate objective focusses on keeping the rise in global average temperatures well below 2°C above pre-industrial levels, while simultaneously driving efforts to restrict that increase to 1.5°C. As a company focused on energy efficiency and heat recovery, we aim to contribute to these goals by helping our customers reduce energy consumption and avoid CO_2 emissions through the implementation of our solutions.

Actions to manage impact

- We will keep tracking our emission scopes to gain valuable insights into our sustainability progress.
- Our entire vehicle fleet has been electrified and will stay electric to further reduce emissions.
- We have solar panels installed and an energy storage system at our office for the purpose of generating our own electricity and being able to store the energy we don't use for later usage.

We continue to strive to improve ourselves every year, as sustainability is an important aspect to us and our company.

Tracking effectiveness

In 2025, our own carbon footprint comprised the following aspects:

Topic	Unit	Value 2025	Kg CO_2 2025
Bought Electricity (Non-renewable)	kWh	0	0
Bought Electricity (Renewable)	kWh	31,983	0
Solar generated electricity total	kWh	14,488	0
Solar generated energy fed back to the grid	kWh	9,131	0
Net bought electricity	kWh	17,495	0
Natural gas	M^3	896	1.688
Fuel (E10)	Liters	180.04	385,1
Fuel (Diesel)	Liters	572.84	1.492
Electricity for mobility	kWh	41,098	0

We expanded upon our prior accomplishments by further diminishing energy usage and the consequent emissions of CO_2 for our clientele:

In this report, we would like to show how much CO_2 emissions we have converted into heat recovery. By providing our customers with the most optimal solution, we have been able to realize more heat recovery projects. Many customers tend to choose the option they are most familiar with. However, alternative solutions are also available that enable us to help customers recover and utilize waste heat that would otherwise be released into the atmosphere.

Topic	**2025**
Number of heat recovery projects	33
Total additional heat recovery realised	65.8 MW
Total additional annual heat recovery from projects realised	0.52 million TWh
Total CO_2 emissions diverted *	116,700 metric tonnes

** Diverted CO2 emission based on natural gas equivalent in The Netherlands – Source:* https://zoek.officielebekendmakingen.nl/stcrt-2026-1591.html?

CASE STORY

CHILLING CHALLENGE: HEATING PROPANE WITH SEAWATER

How do you heat liquid propane from −43.2 °C to −5 °C safely, in a controlled way, and without unnecessary energy use? A major international player in oil and gas storage approached Kapp with this question. For years, their installation had relied on a conventional steam boiler fired by natural gas. Reliable, but expensive, and with CO_2 emissions that increasingly conflicted with the company's ambitions.

The objective was clear: it had to be more sustainable, safer, and more efficient, without compromising operational reliability. Kapp developed a solution that brought these ambitions together and achieved a CO_2 reduction of no less than 75%.

A sea of energy

Liquid propane at −43.2 °C requires extremely precise heating. Heating it too quickly or unevenly is not an option. Safety is always the top priority. Electric heating initially seemed like a logical solution, but grid limitations made it impractical. On top of that, both investment and energy costs would increase significantly. So, the question was reframed: Could it be done differently? Smarter? Using resources already available? The answer was literally right on the doorstep: seawater.

No combustion, but heat: The switch to seawater

Kapp designed a system that uses seawater as a heating medium, a source that is continuously available at no cost. No combustion, no flue gas discharge, but a cleverly utilized heat difference. The process consists of two carefully coordinated steps.

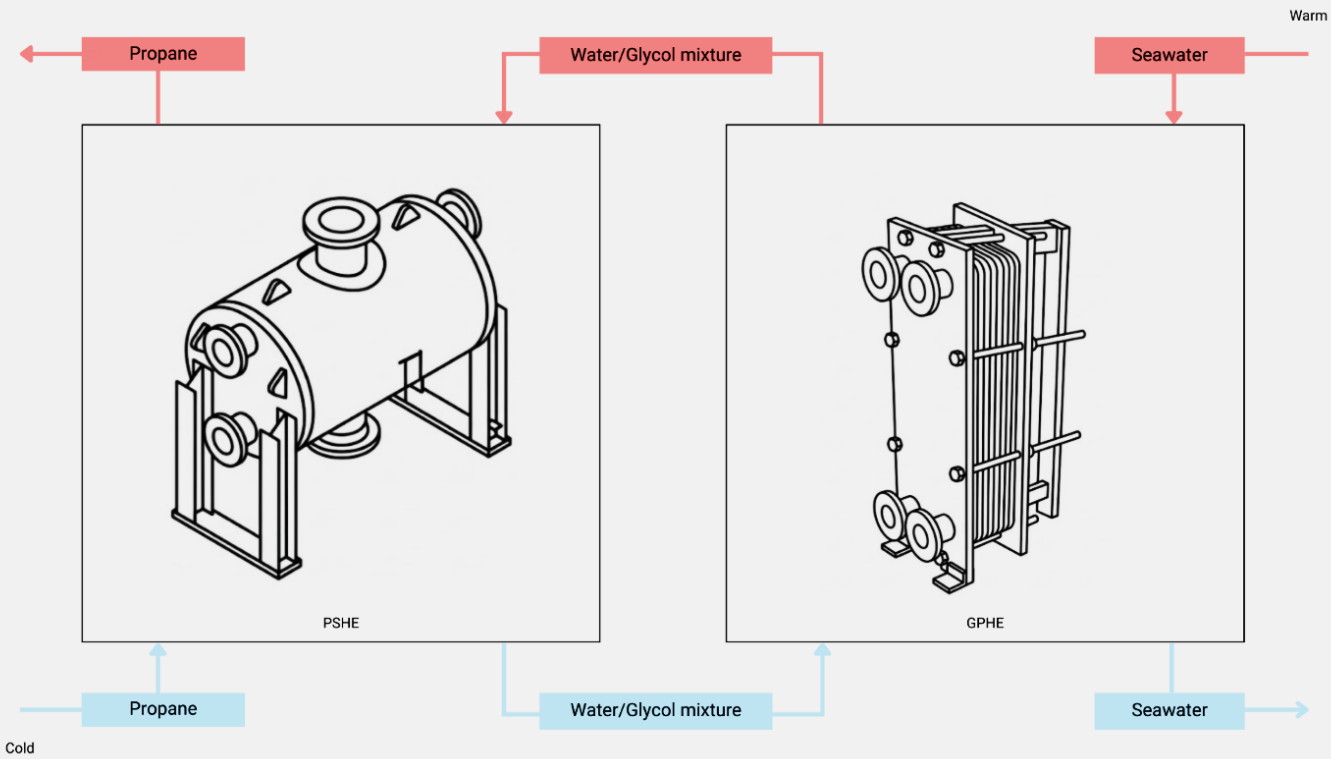
Step 1: Seawater as a sustainable energy source

In our customer's process, the glycol cools down to -4°C. In a Kelvion Gasketed Plate Heat Exchanger (GPHE), we heat this glycol/water mixture with seawater back to around 4°C. Thanks to its salt content, seawater does not freeze at low temperatures, which means it can still be used in cold conditions.

Step 2: Controlled heating of propane

Next, a Vahterus Plate & Shell Heat Exchanger (PSHE) transfers the heat from the glycol/water mixture to the liquid propane. During this process, the temperature of the propane rises from -43.2°C to -5°C, which is exactly within the desired parameters.

Together, these steps form a closed, stable energy loop: an efficient glycol circuit that continuously transfers heat. The key here is "indirect." Because the seawater and propane never come into direct contact, the process remains safe and fully controllable. Even under extreme conditions, the system stays stable. Freezing is prevented, and temperature fluctuations are minimized.



A clever detail: the heat exchangers are coated in a dark material that absorbs additional heat from solar radiation. This isn't a major modification, but a smart optimization that further boosts efficiency. Of course, the coating is fully resistant to the low process temperatures.

Where natural gas used to be the driving force, seawater is now the silent engine behind the heating process. A solution that shows that innovation is not always about more energy, but about using what we have more intelligently.

The result: simplicity in complexity

- Lower operating costs
- 75% reduction in CO_2 emissions
- Less dependence on fossil fuels
- A more stable and safer process

MATERIAL USE

Impact ambition

Every year brings challenges that can lead to fluctuations in the raw materials market. Over the past year, these fluctuations were driven in part by the ongoing conflict in Ukraine and geopolitical restrictions affecting the import of base materials. These developments underline the importance of a sustainable materials policy. To reduce the impact of primary resource extraction and strengthen supply chain resilience, we focus on responsible sourcing and material efficiency.

Those who work every day on sustainable heat transfer solutions also carry that responsibility into their own working environment. That is why we continuously look for ways to reduce our impact within our office operations, from minimising printing and eliminating single-use tableware to carefully separating waste and reusing packaging materials.

For us, sustainability is not an ambition on paper, but a responsibility that we put into practice every day.

Commitment & goals

Traditional Shell & Tube heat exchangers are still widely used, but they are often heavy, costly, and associated with long lead times. In many applications, plate heat exchangers simply offer superior performance. Kapp supports customers in making this transition: our systems can reduce costs by up to 50%, weigh up to 70% less, and achieve higher thermal efficiency. Through an objective Technology Conversion Study, we provide clear insight into the impact of a technology change on process efficiency, reliability, and payback period.
In 2025, we supplied a large number of Plate & Shell heat exchangers, resulting in significant savings in raw materials. The results are shown below:



Tracking effectiveness

Topic	2025
Number of projects with significant material use reduction (technology conversion) realised	67
Total mass material (steel) reduced versus conventional technology	934
Total CO_2 emissions diverted	1,868 metric tonnes

Actions to manage impact

We actively support customers in reducing material consumption by promoting compact heat exchanger technologies as an alternative to conventional designs. Through technology conversion studies, we identify opportunities to achieve the same or better thermal performance with significantly less steel, lower weight and a smaller installation footprint.

Within our supply chain, we work with trusted manufacturing partners and encourage responsible material sourcing, efficient production processes and the reduction of material waste wherever possible. We also continuously look for opportunities to optimise designs, extending equipment lifetime and increasing resource efficiency throughout the product lifecycle.

Internally, we contribute through responsible office practices, including waste separation, reducing paper consumption and reusing packaging materials. By combining innovation, knowledge sharing and material-efficient engineering, we help minimise the environmental impact of industrial heat transfer solutions.

CASE STORY

COMPACT CONDENSERS FOR AN ADDITIVES SUPPLIER

For a new production facility belonging to a supplier of additives, a practical question was: how can we reliably condense solvent vapours whilst space is limited?

Seeking a compact solution

Kapp was asked to contribute ideas regarding the design of the condensers. From a thermal perspective, the solution naturally had to meet the process requirements. At the same time, there was only limited space available above the tanks, where the heat exchangers had to be physically installed.
The initial calculations highlighted the challenge. A tubular heat exchanger approximately three metres long would be suitable from a thermal point of view, but its dimensions meant it would take up too much vertical space above the tanks. It was therefore necessary to find a way to achieve the same heat transfer in a considerably more compact design.

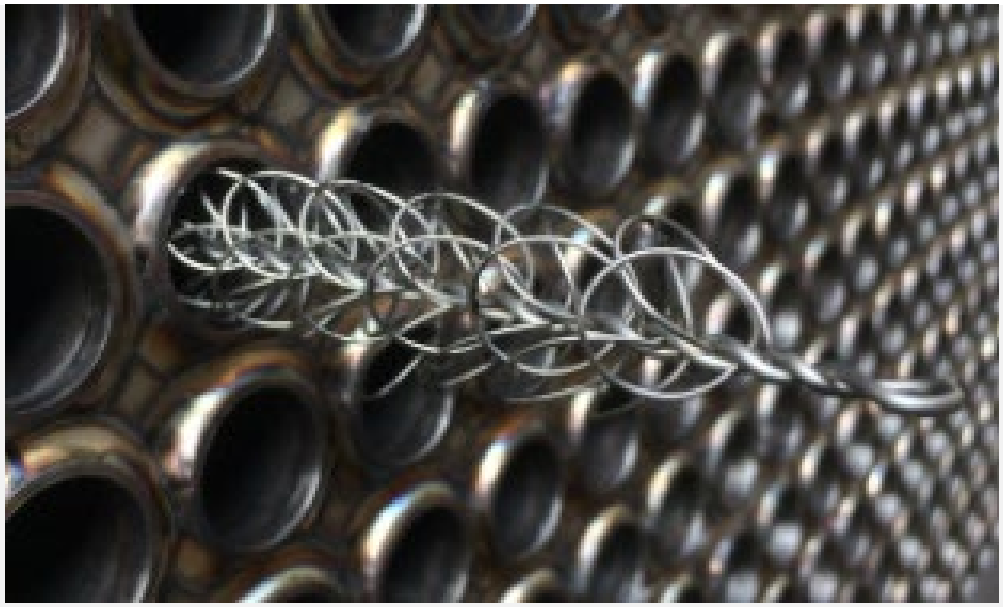
From vapour to condensate

The condensers are used in a production process in which nitrogen, solvent vapours and other VOCs (Volatile Organic Compounds) are released whilst the tanks are being filled. During filling, air is displaced from the tanks. This air contains vapours from which we wish to remove as many VOCs as possible before they are discharged into the environment.
This is where the condensers come in: by cooling the vapour stream, the solvent vapours present condense and can be recovered as a liquid. The condenser thus functions as part of the emission control system.
A shell-and-tube heat exchanger has been selected for this application. A key advantage of this design is the large flow-through surface area within the tubes. This makes it possible for the condensed liquid to flow downwards in the opposite direction to the gas flow. This is known as the reflux effect: as the vapours move through the tubes, some of them condense and the condensate flows back downwards.
The challenge was then not only to condense the VOCs, but also to ensure sufficient heat transfer within the limited space available above the tanks.

Turbulators as the key to a more compact design

Kapp investigated various options for increasing heat transfer without simply adding more heat-exchange surface area. The solution was found in an HRS tube heat exchanger fitted with Calgavin wire mesh turbulators in the tubes. This wire mesh serves two purposes in this application.





1. Increased contact and agglomeration of mist droplets
The wire mesh creates additional opportunities for contact between the mist droplets present. This allows smaller droplets to come into contact with one another and agglomerate. Whilst the effect is not comparable to that of a full-scale demister, the turbulators do help to promote the coalescence of condensate within the pipe.

2. Greater turbulence, better heat transfer
In addition, the turbulators create more movement in the fluid. The turbulence and vortices cause the thermal boundary layer along the tube wall to be repeatedly disrupted. This brings the fluid into closer contact with the wall, allowing more heat to be transferred. It is precisely this additional heat transfer that made it possible to design the heat exchanger considerably shorter, without losing capacity.

From three metres to 70 centimetres
Thanks to the modified tube configuration and the wire mesh turbulators, the design could be significantly shortened. Whilst the initial design called for a tube length of approximately three metres, a heat exchanger measuring just 70 centimetres was ultimately realised. This resulted in a solution that provided sufficient heat transfer to condense the VOCs in the displaced air and also fitted within the limited headroom available above the tanks. This enabled the condensers to fulfil their role in emission control without taking up an unnecessary amount of space in the new production facility.

INNOVATION MANAGEMENT

Innovation management is essential for Kapp to remain competitive and meet the evolving needs of our customers. We continuously monitor developments in industrial processes and emerging energy markets to anticipate future demand and identify new opportunities. Particular areas of focus include hydrogen, ammonia, Sustainable Aviation Fuel (SAF) and Carbon Capture and Storage (CCS), which are expected to play an important role in the global energy transition.

Impact ambition

Our ambition is to support the transition towards a more sustainable and energy-efficient industrial sector. By applying our expertise in heat transfer and thermal process solutions, we aim to contribute to innovative applications in emerging markets such as hydrogen and ammonia.



In addition to technological innovation, Kapp continuously invests in digitalisation and process improvement. During the reporting period, we implemented a new ERP system to enhance project management, customer relationship management and document control. This system enables more efficient workflows, improved forecasting and data-driven decision-making, supporting both operational excellence and future growth.

Commitment & goals

To strengthen our position in developing markets, we invest in long-term partnerships and continuous knowledge development. A key example is our collaboration with Thermon, which has grown into a strong strategic partnership over the past four years. The increasing demand for industrial electric heating solutions further emphasizes the value of this cooperation.
We also aim to expand our expertise and involvement in hydrogen and ammonia-related projects, enabling us to support customers as these markets continue to develop.

In addition, we continue to invest in our digital capabilities and online presence. As technical expertise and market knowledge are increasingly shared through digital channels, it is important that customers can easily access our insights, solutions, and experience. By improving our visibility in search engines, expanding our online content, and strengthening our digital communication, we aim to increase our market reach and support our long-term growth ambitions.

Actions to manage impact

Kapp actively follows developments throughout the hydrogen and ammonia value chain, from hydrogen production and transportation to ammonia heating and ammonia cracking applications. We are preparing to support projects in these fields as market adoption continues to grow. At Kapp, we focus on the entire value chain, from hydrogen production and transportation to the eventual cracking of ammonia. As many of these processes are still evolving globally and have not yet fully matured, we embrace the principle: “Here to teach, here to learn.” by sharing our knowledge and experience while collaborating with other experts across the industry, we can continue to innovate together and help accelerate the energy transition.

Tracking effectiveness

We monitor our progress through both internal and external indicators. Internally, we evaluate the effectiveness of our ERP system by improving project visibility, reporting capabilities and operational efficiency. Customisable dashboards and automated reporting provide valuable insights that support informed decision-making.

Externally, we closely monitor developments in hydrogen, ammonia, SAF and CCS markets and maintain active engagement with industry stakeholders.

Kapp will continue participating in events such as the World Hydrogen Summit & Exhibition in Rotterdam, allowing us to exchange knowledge, identify opportunities and assess how our solutions can contribute to the energy transition

RELATIONSHIP WITH STAKEHOLDERS

Impact ambition

Our employees and supply chain partners are the foundation of both our success and our sustainability efforts. Without their expertise, commitment, and collaboration, Kapp would not be where it is today.

Over the past year, we faced a nationwide shortage of skilled labour within the manufacturing sector. This placed additional demands on the flexibility and resilience of our team, with colleagues regularly supporting activities in engineering and expediting to ensure continuity and maintain service levels for our customers.
Thanks to our strong internal culture and the close relationships we maintain with our suppliers, we have continued to navigate geopolitical tensions and market challenges successfully and resiliently together.

This year, our partner Thermon acquired the Italian manufacturer Fabbrica Apparecchiature Termoelettriche Industriali S.r.L. (F.A.T.I.). This acquisition brings significant advantages for Kapp. It enables us to serve our European customers even more efficiently and expands our offering to include PED-certified heaters. In addition, the acquisition supports shorter lead times, more efficient transportation and packaging, and the production of longer heating elements of up to 4.5 metres in length.

Commitment & goals

Every year, we participate in trade fairs and industry events to build and maintain relationships with customers, stakeholders, and prospective clients. These events also provide valuable opportunities for face-to-face conversations, allowing us to share who we are, what we do, and how we can create value for our customers.
Over the past year, we attended the Warmte Congrestival, the National Energy Saving and Efficiency Event, and exhibited at the World Hydrogen Exhibition in Rotterdam Ahoy.



In addition, our Managing Director, Jeroen van Ruitenbeek, became a member of the steering committee of Heat Exchanger World. In this role, he is actively involved in organising industry events and maintains close contact with professionals across the global heat transfer sector.

Furthermore, our Non-Executive Director, Tjark de Lange, has served as Chair of the Board of HTRI since last year. HTRI is a leading research institute and authority in the field of heat transfer, providing advanced thermal process design and simulation software that is widely regarded as the industry standard. In addition, Tjark serves as Chairman of Stichting Warmtenetwerk, a platform that acts as both a knowledge hub and a strong professional network for organisations involved in district heating and heat network development.

Together, these positions provide Kapp with valuable opportunities to establish new connections, strengthen existing relationships, and contribute to the advancement of knowledge and innovation within the heat transfer industry.

Actions to manage impact

Several key industry events are already planned for next year, and we look forward to further strengthening collaboration with our partners. Guided by our motto, *“Here to teach, here to learn”*, we actively share knowledge and expertise through online webinars, digital content, lunch-and-learn sessions, and industry exhibitions. Alongside digital communication, we continue to invest in personal relationships with our partners and customers. By exchanging knowledge, maintaining open dialogue, and fostering long-term collaborations, we strengthen our network and contribute to the continued development of sustainable and efficient heat transfer solutions.

GOOD EMPLOYERSHIP

Impact ambition
Today's labour market presents significant challenges, particularly when it comes to attracting and retaining qualified engineers. At Kapp, we believe that a sustainable people strategy starts with a healthy, safe, and inspiring working environment. Our priority is to foster a company culture in which employees feel valued and are given the opportunity to develop and grow. We are proud that, as a result, our employee turnover rate remains significantly below the industry average. To support the physical and mental wellbeing of our employees, we continuously invest in a healthy working environment:



Ergonomics & workplace design: All office workstations are equipped as standard with ergonomic sit-stand desks, adjustable office chairs, and monitor setups that can be tailored to individual needs.

- **Healthy working environment:** We promote employee wellbeing by providing fresh fruit and healthy snacks. In addition, our office incorporates indoor plants to improve air quality and create a pleasant working atmosphere.

- **Acoustics & focus:** The installation of soundproof phone booths and a revised office layout enable both focused individual work and effective collaboration.

At Kapp, we are committed to building long-term relationships with our employees. Transparent communication, continuous support, and opportunities for personal and professional development form the foundation of this commitment.
For example, our colleague Bob Woudenberg is currently following the Inspection and Testing Techniques Level 3 training programme to further expand his expertise and continue developing within our team.

We also actively encourage knowledge sharing between junior and senior engineers. This not only supports the professional development of our employees but also helps distribute workloads more evenly across the organisation.

Commitment & goals

- **Talent retention:** We aim to maintain high employee satisfaction and a low employee turnover rate by continuously investing in a positive work environment and opportunities for personal and professional development.
- **Team expansion & workload management:** We seek to attract new talent to reduce workload pressures and further broaden the specialist knowledge and expertise within our team.
- **Sustainable employability:** We are committed to further formalising our wellbeing and training policies to support the long-term health, engagement, and development of all employees.

Actions to manage impact

We will always listen to our employees and actively value their feedback to ensure an optimal working environment and a positive workplace culture. By maintaining open communication, encouraging employee involvement, and continuously evaluating workplace wellbeing, we strive to create an environment where everyone feels heard, supported, and empowered to perform at their best.

During the past year, we expanded our team with two additional engineers to support growing customer demand and further strengthen our technical expertise and operational capacity. We also welcomed a Marketing & Communications Specialist who is responsible for activities such as exhibition management, website development, content creation, and enhancing our online presence.

Tracking effectiveness

Topic	2025
Number of employees	16
Mean tenure of employees	12,33
Employees < 26 years	1
Employees 26 – 35 years	3
Employees 36 - 45	4
Employees 46 – 55 years	5
Employees > 55 years old	3
New hires	3
Employees left	3

LOOKING FORWARD TO 2026

Sustainability remains a continuous journey for Kapp. We continuously assess our environmental impact and actively seek opportunities to further improve the sustainability of our operations.

In 2025, we further strengthened our focus on energy efficiency and heat recovery. In 2026, we will continue exploring ways to reduce our own energy consumption and further increase the role of heat recovery within our projects. We actively support our customers in developing solutions for waste heat recovery as well as implementing new energy sources and energy carriers such as hydrogen, ammonia, and Sustainable Aviation Fuel (SAF).

At the same time, we are investing in the further optimisation of our ERP system. By making data more accessible and using it more effectively for analysis and forecasting, we aim to improve decision-making, streamline our processes, and enhance our ability to respond to market developments.

Our ambitions also require an organisation that grows alongside them. For this reason, we will continue expanding our team to better support our customers and partners. We also see significant opportunities to strengthen personal relationships. By engaging more frequently in face-to-face interactions with customers and partners, we can better understand their needs, share knowledge, and explore new sustainability opportunities together.

In 2026, we will therefore continue building an organisation where innovation, sustainability, and collaboration reinforce one another. In doing so, we are taking steps that not only create value today but also contribute to a future-proof Kapp.

Jeroen van Ruitenbeek – Managing Director

