



AVK SUSTAINABILITY REPORT 2021/2022

Expect... **AVR**



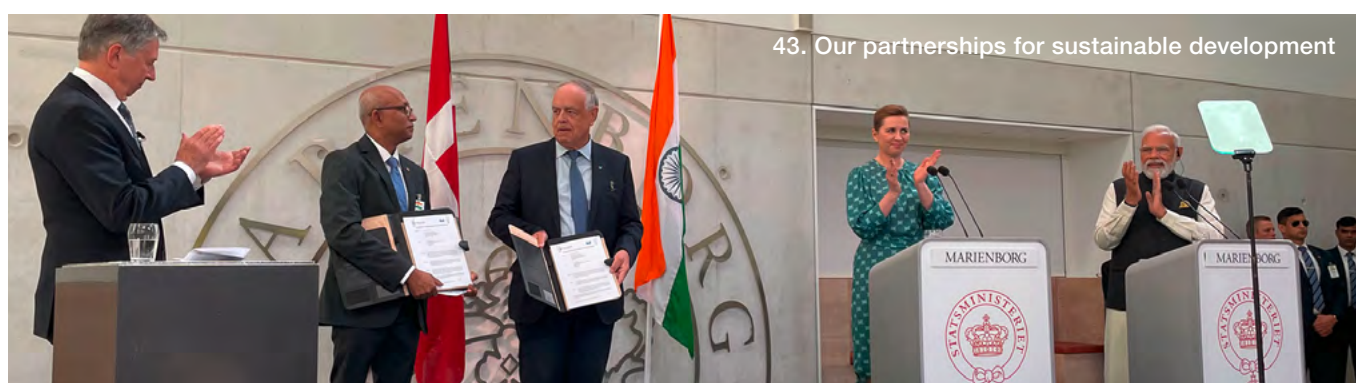
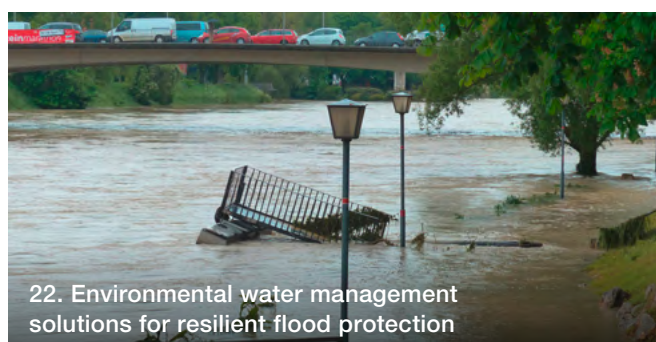
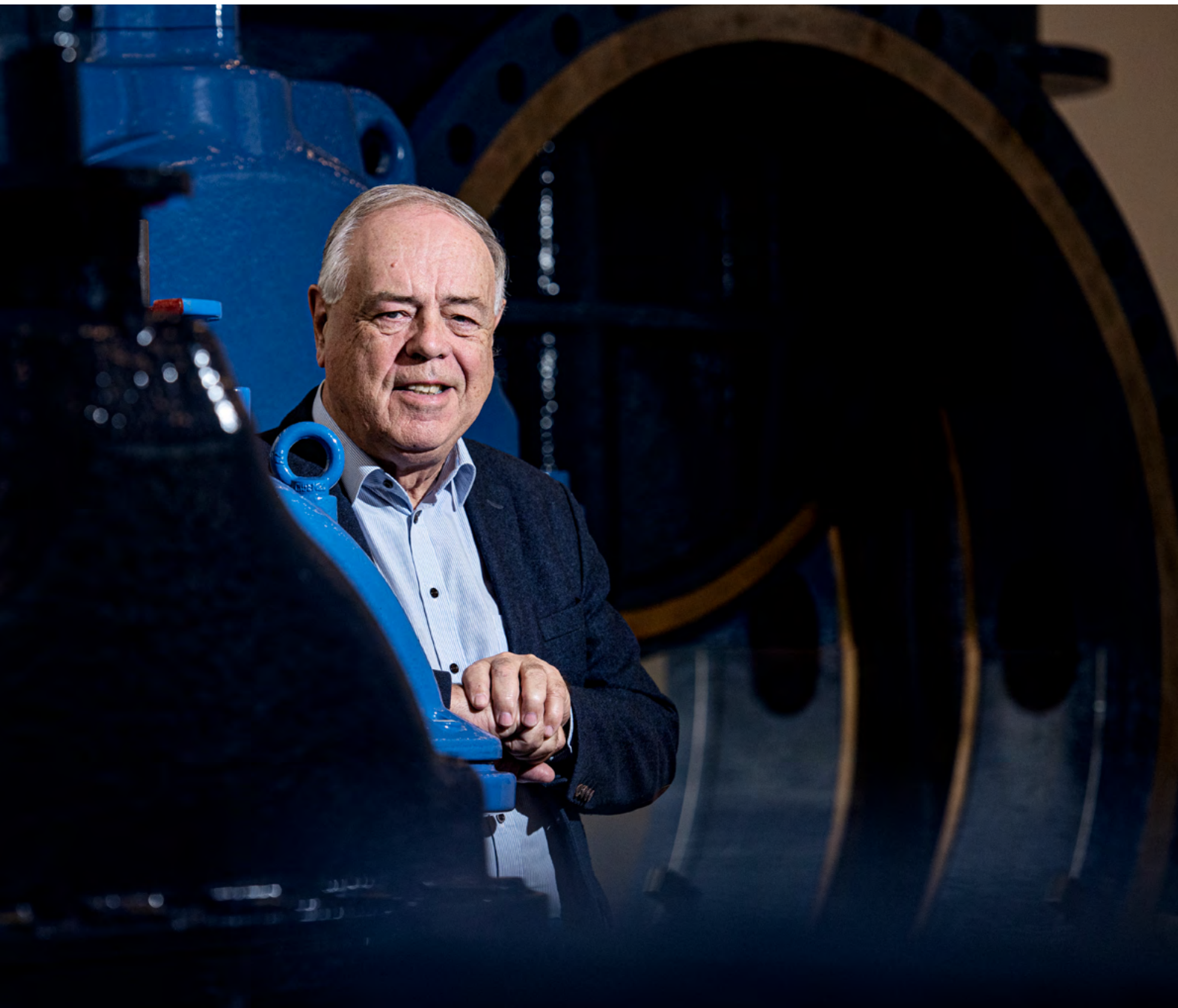


TABLE OF CONTENTS

Introduction by Niels Aage Kjær	5	Hydropower: the natural flow of moving water to generate electricity	24
Our history, purpose, and business units	6	Warm water from industries converted to district heating	24
Our values	7	Biogas turns waste into electricity	25
Our Business Model	8	Cast iron converted into new products	25
Our risks and opportunities	10	Recycled plastics in our production	26
Our contribution to the UN Sustainable Development Goals	12	Innovation and development within our business areas	27
Water loss: probably the most critical resource challenge of our time	14	Our environmental and climate effort	28
Our PREMIUM 100 gate valve is built to last a century	15	Supplier management and co-operation	33
AVK Smart Water provides accessible and reliable data	16	Our social responsibility	34
Optimising water resources through intelligent irrigation	18	Our partnerships for sustainable development	43
Wastewater as a resource	20	Our future activities and areas of action	45
Environmental water management solutions for resilient flood protection	22	Appendix	47



We are pleased to bring you the fourth edition of the AVK Group's Sustainability Report. In this edition you can read about a range of initiatives adopted by the AVK Group of companies that support responsible and sustainable development while also contributing to helping solve some of the challenges faced by our society.

The data compiled in this report is from the financial year 2021/22 and includes all activities of the AVK Group. The report details initiatives, any new initiatives launched, and the results we have achieved over the past year. This is part of

the AVK Group's annual report for 2021/2022, which covers a mandatory section on social responsibility, gender balance in management, and data ethical policy.

INTRODUCTION BY NIELS AAGE KJÆR

I am pleased to present our sustainability report for the financial year 2021/22. The previous year presented challenges in the shape of transportation, energy and raw material prices, covid-19, and global logistics. Despite these, the AVK Group has achieved a fine result which will help ensure our future development with a focus on long-term and sustainable investments to the benefit of the company, our employees, customers, and the environment.

AVK was founded in 1941 by Aage Valdemar Kjær and is based on the fundamental values of quality, innovation, reliability, sustainability, and customer service. Sustainable development has always been part of the AVK DNA, and our five fundamental values are the compass that we use to steer the business.

Today, AVK is a global Group of companies that comprises many, very different companies that supply solutions within several areas. It is the goal of AVK to develop, manufacture and market high-quality products with a long lifespan, that are part of vital infrastructure, including water supply, wastewater handling and energy supply as well as various industrial applications that combined, contribute to a sustainable development, the health of people and a better environment.

From the beginning, our focus has been on innovation and the development of high-quality products with a long lifetime to accommodate the needs of our customers. In this report you can read more about the way we have

developed various innovative products and solutions that help make a difference to sustainable development, including the PREMIUM 100 valve, Smart Water, intelligent irrigation, valves for application within wastewater handling, handling of large volumes of rainwater, distribution of district heating, production of biogas and hydroelectrical energy as well as products made from recycled materials.

In addition to investments in product development and new business areas, we remain attentive to constantly improving processes and reducing the environmental and climate impact. We have developed an environmental and climate strategy which revolves around the reduction of CO₂ emissions and analysis of the life cycle of our products. We are dedicated to minimising the energy consumption and increasing the use of green sources of energy, through investments in solar panels. We also work with the way we handle waste and apply recycled materials in the production of new quality products. You can read more about our sourcing of recycled materials, including recycled plastics, which is a core part of our business strategy.

The AVK Group has companies in many different countries and our employees have different nationalities and backgrounds. We respect the differences of our employees and consider diversity a strength in our local anchoring and global development. Working across geographical and cultural borders

creates an interesting and developing working environment. AVK wants to be a healthy, professionally challenging, and safe place to work which also entails working in a structured way to reduce the number of work-related accidents.

AVK operates within several business areas that are in the process of an interesting development. In recent years, there has been an increased focus on handling of drinking water and wastewater, something that massively influences health and quality of life, as well as energy consumption and climate.

Water plays a crucial role when it comes to solving the problems underlying the UN Sustainable Development Goals (SDGs). The SDGs 6 on clean water and sanitation and 9 on infrastructure, sustainable industry and innovation are particularly relevant to AVK.

We also consider SDG 17 on partnerships for sustainable development decisive for the success of the other SDGs. We co-operate across local, national, and international authorities, organisations and companies that focus on SDG 6. In addition, AVK contributes to the fulfilment of other SDGs. More on this in this report.

Niels Aage Kjær
CEO and owner of the AVK Group

OUR HISTORY, PURPOSE, AND BUSINESS UNITS

AVK is a family-owned Group of companies with headquarters in Galten, Denmark. It is built on the foundation of an 80-year-old machine shop founded in 1941 by Aage Valdemar Kjær, hence the name AVK. Today, the global Group employs more than 4,800 people and consists of more than 100 production and sales companies.

Our purpose

It is our purpose to develop, manufacture and market products of a high quality and with a long life span. The products are part of vital infrastructure, including water supply, wastewater handling, energy supply as well as several industrial applications that contribute to a more sustainable development, the health of people and a better environment.

Business units

AVK is divided into three business units: AVK Water, AVK Industrial and AVK Advanced Manufacturing.

All three units consist of companies with strong product and production competencies that are used within various business segments across the world. To accommodate the wishes of our customers, we design, produce and market our own products.

AVK Water

The main business areas of AVK Water are water supply and wastewater handling. Additionally, the business unit comprises distribution of natural gas and biogas, irrigation, firefighting, and HVAC (Heat, Ventilation, Air-condition, Control). HVAC covers technical specialities within heating systems, ventilation, cooling, electrical wiring, automation, and regulation.

Elements such as water, cooling and heating are crucial to society and we can supply unique solutions, tailored to fit local conditions and requirements according to local standards and certifications.

AVK Water provides most of the turnover.

AVK Industrial

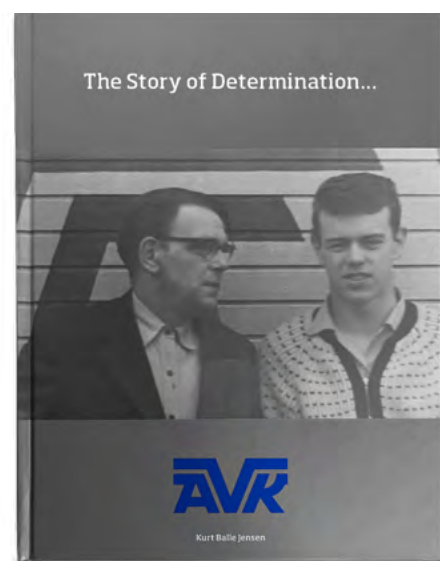
AVK Industrial consists of companies that develop, manufacture, and sell a broad selection of valves to industrial segments. Many of the products are components of applications that contribute to a sustainable development within a variety of industries. Specific examples are water and air purification systems, remote cooling and heating, energy supplies, mining, pulp and paper, dams and reservoirs, hydropower, as well as water management solutions to combat flooding.

AVK Industrial is responsible for approximately a quarter of the turnover.

AVK Advanced Manufacturing

AVK Advanced Manufacturing produces processed components of steel, cast iron, aluminium, bronze, rubber, and plastics. The components are part of the broad selection of valves of AVK Water and AVK Industrial, and in this way the business units support each other. Also, they are used in certain industrial applications. Processed components of steel, iron, aluminium, and bronze are part of certain segments within transport and wind turbine industries. Rubber compounds and solutions are used within food and health industries. Plastics companies also produce waste containers and pallets with focus on using recycled plastics.

For more information, please refer to our financial report and overview of the companies of the AVK Group in the [download section](#) of our website.



OUR VALUES

AVK is centred around five core values that act as guiding principles for how we run our business. These values keep our company healthy and constantly commit us to remaining industry leaders.

Quality

Quality is present in all that we do. Quality is in every step of the process from initial idea to its execution. It is in our activities and our behaviour – both between colleagues and when dealing with customers and others we come across when performing our job. It is found in our products, processes, delivery, service, communication, and guidance. This approach to quality has created the foundation for our position as a market leader.

Innovation

Innovation is key to our company. We focus on innovation and development of new and optimised products of high quality and with a long lifetime. With an innovative approach to the development and design of our products and solutions, we remain adaptive to current and future market demands.

Through continuous scrutiny and optimisation, we ensure that our products and solutions are always as efficient as possible. In addition, AVK pays attention to investing in new technologies and business areas that promote a more sustainable development.

Reliability

Reliability is crucial to us. We strive to be a reliable and credible company that creates long-lasting results and relationships between ourselves and our employees, customers, and other stakeholders. Reliability is key, and it is important for us to document our reliability and credibility as a company. We are proud to be certified according to the ISO 9001 standard for quality management, to the ISO 14001 for environmental management, ISO 29001 for quality management within the oil and gas industry, and ISO 45001 which is an international standard for occupational health and safety management.

Sustainability

Sustainable development has always been a part of our DNA, and we work with sustainability on different levels. From the

beginning, we have had a strong focus on innovation and development of high-quality products with a long lifetime. At the same time, we continuously work on reducing our impact on the environment and climate in the production of our products. We want to invest in innovative technologies and business areas that contribute to the green transition.

Customer Service

Customer service is important to us, and we measure our success through our customers' progress and satisfaction - not only with our products, but also with the way we are able to handle their needs, enquiries, and requests. We believe in long-term partnerships and in being close to our market, always with our customers' needs at heart.



OUR BUSINESS MODEL

Our business model reflects a Group with attention to technological innovation, responsible production, dedicated employees and involvement of stakeholders.

RESOURCES

EMPLOYEES

We employ qualified employees who are able to support the business with their knowledge and competences. At the same time, we focus on long-term relations, diversity and development.

INNOVATION AND DEVELOPMENT

We continuously focus on innovation and development of new products, solutions and business areas.

PRODUCTION

We source materials and products responsibly from local as well as global suppliers and business partners.

ACTIVITIES



AVK WATER



AVK INDUSTRIAL



AVK ADVANCED
MANUFACTURING



SOCIETY

AVK develops, manufactures and markets products of high quality and with a long lifetime that are part of vital infrastructure including water supply, wastewater treatment and energy supply as well as a variety of other industrial applications that all together contribute to sustainable development, the health of people and a better environment.

CUSTOMERS

We optimise customer solutions to create the highest possible return on the invested resources.

VALUE CREATION

RESPONSIBILITY

We run our business in a responsible way with focus on sustainability and care for the environment.

STAKEHOLDER ENGAGEMENT

Our relationship with our stakeholders is built on trust and long-term relations – always with common value-creation in mind.

FINANCIAL YEAR 2021/2022

Turnover: DKK 7,585 million
Employees: 4,886
Companies: 106
Represented in 37 countries

ACTIVITIES

EMPLOYEES

We focus on being a healthy and safe workplace for all our employees as well as creating attractive jobs and economic growth.

SHAREHOLDER VALUE

We create values for our shareholders, but prioritise reinvestments and an active ownership.

AVK is a global Group. We operate within various segments and under a variety of conditions. As we will describe in the section on risk management, we are very conscious of the risks that come with being a global Group of companies. Therefore, we monitor our own and external production units to ensure that the specified criteria for environment and human rights are complied with.

Our foundation is to act in a responsible manner towards our employees, towards the environment and towards the society that surrounds us.

OUR RISKS AND OPPORTUNITIES

All companies face risks and opportunities. To allow a company to grow, it is crucial to make the right choices at the right time. As an industrial Group of companies within various industries, often involving long supply chains and many collaborators, this is a challenge - particularly in times with a fluctuating global economy.



The global economy

In October 2022, the International Monetary Fund (IMF) scaled down their expectation of growth for 2023. [Reuters](#) states that IMF Managing Director Kristalina Georgieva has spoken at Georgetown University in Washington D.C., saying that we are facing a major shift of the global economy. We are talking about changes that result in higher economic volatility, geopolitical confrontations, and more frequent natural disasters. We may be facing global recession.

AVK is selling products across the world and to numerous sectors where demand will depend on the general economic development, and our sales will be affected by this. The great diversity and a continued need for investments within strengthening water and energy infrastructure provides AVK with a robustness in the face of economic fluctuations. Adding to this are the significant investments in recent years into our production facilities, into an efficient supply chain and into a transition to renewable energy. Thereby, we will strengthen our competitiveness and ensure that we will continue to be able to expand our market shares.

Organisational development

The AVK Group's more than 100 companies largely act as independent units which gives AVK an agility and adaptability and facilitates local adaptations of our business and our organisation. We are, however, also aware that in our endeavour to make sustainability an integral part of the business, we have in some areas, chosen a centrally co-ordinated and systematic approach. For this reason we established a sustainability committee in 2021. In 2022 we established a sustainability department as a support function in AVK Holding, and by 2023 we will initiate networking groups focussing on CO₂ reduction and circular economy.

The AVK Sustainability Policy

Our global presence requires high ethical standards and actions of our organisations. We want to be a responsible and credible company that balances economic, environmental, and social matters. This is mirrored in our Sustainability Policy.

Group Policies

AVK has established Group Policies that dictate how the individual companies are to fulfil our corporate social responsibility within the topics of employees, environment, ethics, safety, and quality. The policies are available in the Group's quality management systems (QEMS) and so distributed to all companies in the Group. Additionally, through our Code of Conduct for suppliers, we have defined principles and guidelines for the protection of the environment and compliance to human rights.

This way we constantly strive to be a credible and ethically responsible partner to our customers, our suppliers, and other stakeholders.

Our global presence

As we operate in countries where compliance to human rights, occupational health and safety, protection of the environment and climate as well as anti-corruption, are not a matter of course due to the existing culture and legislation, we are aware of the risk that our Group values are violated. Because of this, we pay attention to the compliance to our Policies in all companies of the Group and we support this effort with ongoing audits. The main risks are evaluated in the coming sections.



Environment and climate

We estimate that the main risk within climate is lack of attention to minimising the amount of energy consumed. We must also maintain a focus on recycling of materials and handling of waste to avoid impacting the local environment more than necessary, and on circular economy.

In our aim to minimise our environmental impact, we have developed an environmental and climate strategy. We also comply with our environmental policy by constantly trying to minimise our environmental and climate impact of our Group and suppliers. We will elaborate in the section on environment and climate.

Human rights

It is our assessment that the risk of non-compliance with human rights lies with our sub-suppliers, including forced labour and lack of equality. This why we work systematically on registering, controlling, following up on, and developing the collaboration. We will expand this in the section on supplier co-operation.

Anti-corruption and bribery

As a global Group of companies, we assess that there is a risk of corruption in some of the countries where we are present. AVK does not accept any kind of action that may be considered corruption or bribery. We have a zero-tolerance towards such incidents and consider them gross misconduct and they may result in disciplinary actions. We have a compliance agreement with requirements of compliance with national and international laws on anti-corruption and bribery. We will address this in the section on social responsibility.

Employee relations

As an industrial Group of companies with numerous production facilities we consider work-related accidents a significant risk and hence it is an area of high priority. Additionally, the individual companies will have attention on mental health and safety. Initiatives within both areas are described in the section on social responsibility.

The AVK Sustainability Policy

We recognise that our global presence requires high ethical standards throughout our organisation and our actions.

We want to be a responsible and credible company with the ability to balance economic, environmental, and social matters.

This means that:

- The AVK Group supports the UN Sustainable Development Goals. Our main area of attention is the goals relating to clean water and sanitation (6) and industry, innovation, and infrastructure (9) as these areas represent our core business. AVK also contributes to other goals, and we consider SDG 17, on partnerships for sustainable development, crucial to the success of the other SDGs.
- We ensure that sustainable initiatives are fundamental in our production and that we have a healthy and safe working environment. We focus on environment and long-lasting solutions and have achieved certifications that we are proud of:
 - ISO 9001 – Quality management
 - ISO 29001 – Quality management in the oil and gas industries
 - ISO 14001 – Environmental management
 - ISO 45001 – Occupational health and safety.

OUR CONTRIBUTION TO THE UN SUSTAINABLE DEVELOPMENT GOALS

The UN 17 Sustainable Development Goals (SDGs) are the framework for the global effort within sustainable development. The goals recognise that social, economic, and environmental development are intrinsically linked and that it requires a common, global effort to achieve lasting results. We are aware of our co-responsibility. SDGs 6 and 9 are particularly relevant to our business model but we also work with other goals either strategically or via decentralised activities as described below.

Our product portfolio in the business unit AVK Water is a direct extension of the UN SDG 6 which aims at ensuring access to clean water and sanitation and a sustainable management of this.



Our valve solution help ensure clean drinking water in established water supply systems as they provide a reliable, durable, and stable water management and so assist at reducing water loss and energy consumption. Our products are also part of wastewater handling. AVK products and solutions are applied to various processes that aim to ensure responsible wastewater handling and to avoid risk to the environment and health. They are also used in processes that exploit the use of energy in wastewater.

The UN SDG 9 is about developing reliable infrastructure, promoting sustainable industries, and investing in scientific research and innovation. All three business units of AVK contribute to this goal as we design and produce innovative products, some of which are used in recycling initiatives and processes or for energy, water, and infrastructure solutions.



Water greatly influences health and quality of life. As we are operating in the water and wastewater industry, we contribute indirectly to the UN SDG 3 which is concerned with health and well-being. Water-related disease is a major problem globally, and wastewater can pollute many drinking water sources



Sustainable energy is at the core of SDG 7. This goal aims at ensuring access for all by 2030 to reliable, sustainable, and modern energy at a reasonable price.



It is specified that the share of renewable energy in the global energy mix must increase significantly before 2030. Our valves for wastewater treatment, for distribution of district heating, and for production of biogas and hydroelectric energy contribute to a larger share of renewable energy.

We work with the UN SDG 8 which is concerned with decent work and economic growth. This means we provide healthy and safe workplaces for our employees both in Denmark and internationally, and we respect their right to equal and fair working conditions.



We only want to co-operate with suppliers that guarantee adherence to legislation for human rights and compliance to our ethical standard, our Code of Conduct.



We are a financially robust and responsible company, and significant investments help improve our competitiveness and maintain our market shares.

Our product portfolio contributes to clean water and sanitation which is the foundation for more sustainable cities and local communities. Equally, our solutions can help cities adapt to extreme rainfall and prevent flooding. This way we support SDG 11 on sustainable cities and communities.



The UN SDG 12 is about responsible consumption and production. We support this goal by developing life cycle analyses and by identifying methods and processes that enables us to recycle materials from our factories. We also apply large quantities of recycled materials in our production, both metals and plastics.



The UN SDG 13 on climate action concerns reducing the increasing global average temperature and strengthen resilience and climate adjustment.

As a player within the water and the wastewater industry, we contribute to this goal as consumption of water influences consumption of energy. The energy consumption required to pump water is reduced when our valve solutions reduce water loss and efficiently handle pressure control in the distribution network.



Within the energy sector, our valves can be part of distribution of water for district heating, production of biogas, hydroelectric energy, and transfer of wastewater into renewable energy.

To adjust society to extreme rainfall, climate adaptation is necessary to avoid flooding. This is another area where AVK companies can contribute with valve solutions.

In addition, we have developed an environmental and climate strategy whose main purpose is to reduce CO₂ emissions through energy reduction in the life cycle of our products and through investments into renewable sources of energy.

We consider SDG 17 crucial for the success of the other sustainability goals. In AVK we want to be part of creating a sustainable water and energy supply and building a community where circular economy plays a larger role. Co-operation across local, national, and international organisations, authorities, industries, and professions is necessary, and this is what we do through partnerships.



WATER LOSS: PROBABLY THE MOST CRITICAL RESOURCE CHALLENGE OF OUR TIME

Water has a huge impact on the health and quality of life, on energy consumption and on our climate. The UN SDG 6 is “Clean water and sanitation for all” but in fact water is crucial to solve many of the problems underlying the UN Sustainable Development Goals.



Today, we are wasting tomorrow's water

In many places of the world, water is a scarce resource. Despite this fact, around 30% of the water we collect and distribute from different sources is wasted ([Guppy & Anderson, Global Water Crisis, 2017](#)). In other words, a third of the available drinking water never reaches an end user.

“Water loss is the worst – it is a waste of an often-sparse resource and also of the resources (energy, labour and write-off of infrastructure) used to extract the water.”

Bjørn Kaare Jensen, former President of European Water Association

We use a lot of energy for no reason

With more than a third of water lost, it follows that a third of the energy used in the production

and distribution of water is wasted too. By 2030, if we continue to operate as we do now, we will use twice as much energy on water management ([IEA, World Energy Outlook, 2016](#)).

The reasons for water loss are many, ranging from leakages, pipe bursts, poor water management to illegal connections and unauthorised consumption. But luckily, so are the available solutions.

The technologies are ready – we just need the initiative

In Denmark, our legislation does not permit a water loss rate of more than 10%. Over time, this has resulted in one of the world's lowest water loss percentages and has placed Denmark as a front-runner in terms of efficient water management.

“Leaked water is the largest untapped water resource globally. Denmark has the solution for cutting the leakage level down to just 6%.”

Mads Warming, Global Segment Director Water and Wastewater, Danfoss

As we are already over-exploiting our water sources, and populations are rising, we need to apply better management. And what better way to start than by minimising our waste.

A revised EU Drinking Water Directive, which deals with water loss, drinking water quality as well as a demand for an infrastructure risk assessment, gives hope that more decision makers will see the positive effects of legislating on crucial areas such as water infrastructure.



OUR PREMIUM 100 GATE VALVE IS BUILT TO LAST A CENTURY



At AVK, high quality and product longevity have always been the centre of attention. We develop our valves to be able to withstand underground conditions for at least 50 years, and therefore the resilience of the valve needs to be our absolute key priority.

We have now taken one step further and together with a large Scandinavian utility company we have developed the Premium 100 gate valve. The valve offers supreme protection against corrosion and wear and tear due to the external PUR coating as well as internal components of additional durability. This valve has been designed to last 100 years underground. It is ideal for installations on sites where excavations are not a real option and where longevity and maximum safety are crucial. This could be busy roads, public squares and tourist attractions, coastal areas, or areas polluted by oil or gas.

For the utility, it is also a step towards reducing CO₂ emissions. Replacing parts of a pipe network is costly in terms of i.e., digging, removal of dirt, addition of new asphalt or paving; all processes which today often require the use of conventional energy sources.

Full traceability

A unique serial number for each valve is linked to material and test records and allows for full traceability of the valve and all its main components.

High quality is essential to applying additional technology

The issue at hand is not only longevity; functionality over time is just as crucial. All our valves must always seal 100% tightly when closed off. Technologies such as the district

Non-revenue water is basically produced, cleaned water, which is lost somewhere in the water distribution system, never reaching its destination. This means water not used or paid for, affecting local economies as well as local resources available.

Source: [Water World](#)

metering areas (DMA), non-revenue water initiatives as well as our Smart Water add-ons all rely on the fact that a closed valve equals no water passing.



AVK SMART WATER PROVIDES ACCESSIBLE AND RELIABLE DATA



The foremost duty of a water utility is to ensure a safe and reliable drinking water supply for its consumers. To do this, they must ensure reliable operations and functionality of the water distribution network and be able to react quickly when unwanted changes occur.

Nowadays, many utilities have installed smart consumer meters that can measure water consumption, which is very important for correct billing and for reducing the level of Non-Revenue Water (NRW). But, between smart meters and water pumps, there are only a few data collecting sensors or none at all. A terrible waste, as the distribution network has great potential with thousands of potential points to retrieve useful data.

But how can the utility obtain an overview when the distribution network is buried in the ground and often covers an extensive area?

By applying the AVK Smart Water solution to key network assets such as valves and fittings, data can be delivered directly to a dedicated software platform where it is turned into valuable insights, saving both time, water, energy, and human resources.

Collecting valuable data

The AVK Smart Water solution is a combination of sensors and software. Our software allows easy integration with a preferred IT-system as well as visualisation in our own Smart Water platform, VIDI Cloud.

The sensors are developed for our gate valves, fittings, and fire hydrants. When installed, they can deliver data about pressure, flow, temperature, or whether it's in an open/closed position directly from the distribution network. This way of monitoring network activities makes it possible to save resources, minimise water loss as well as optimise operation and maintenance activities.

The sensors use the wireless IoT-technology, NB-IoT (narrowband internet of things) to secure good coverage, long battery life and high data security. NB-IoT can penetrate through closed structures such as wells and chambers underground.

Dividing the water network into sections

Leaking pipes and equipment due to bursts or breaks, for example, are some of the main causes of water loss. When a leak occurs it can take days, weeks or even years before it is

noticed, and localising the exact area in a huge, wide-reaching network is no easy task.

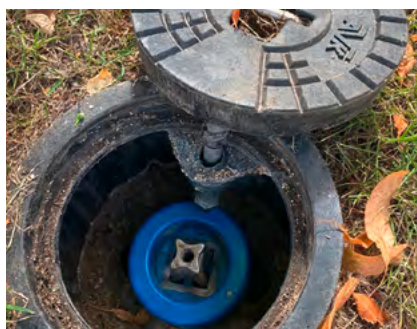
Therefore, dividing the supply network into separate sections, also referred to as district metering areas (DMA), is an efficient technique that makes it possible to obtain a valuable overview of what is going on below the ground. Water losses can then be calculated in the sections individually, and operators are able to better plan and prioritise their efforts.

Coping with water loss in the entire distribution network, rather than in individual zones (DMA's), means working in a reactive, passive manner, where activities are initiated only when a loss becomes visible or is reported.

Improve NRW calculations and support active leakage control with VIDI Positioner

As part of the LEAKman project, VIDI Positioners are installed on valves that are positioned on the boundaries between the district metering areas. From these positions, they will deliver reliable data for water balance and NRW level calculations.

The LEAKman partners did, at an early stage, identify the need for knowing if - and when - DMA boundary valves are operated as this influences NRW management and often leads to false results when conducting water balance assessment and minimum night flow monitoring.





The LEAKman project

(leakage management) intends to demonstrate Danish solutions to reduce water loss and to pave the way for new Danish water technology. The purpose is to implement advanced water distribution by using high-technology products and techniques and by tying components and software together into integrated solutions. The goal is to minimise water loss and an important part of this project is effective tracking and management of leakages.

Read more in the section about partnerships.

Water balance calculations are highly dependent on valid information. It is a well-known problem that if the boundary valves have been opened during maintenance work, they are sometimes not brought back to closed position afterwards. In other words, monitoring the open/closed position of boundary valves can help prevent unmeasured flow between DMAs and thereby ensure more reliable data and calculations.

CASE STORY

VIDI Positioners contribute to an improved overview at Denmark's largest utility

HOFOR, the largest utility company in Denmark, has approximately one million customers in Greater Copenhagen. They have divided the area into 50 DMA zones allowing for, among other things, calculating the water balance and monitoring water loss – one of the most cost-effective ways to spot leaks and thereby reduce NRW.

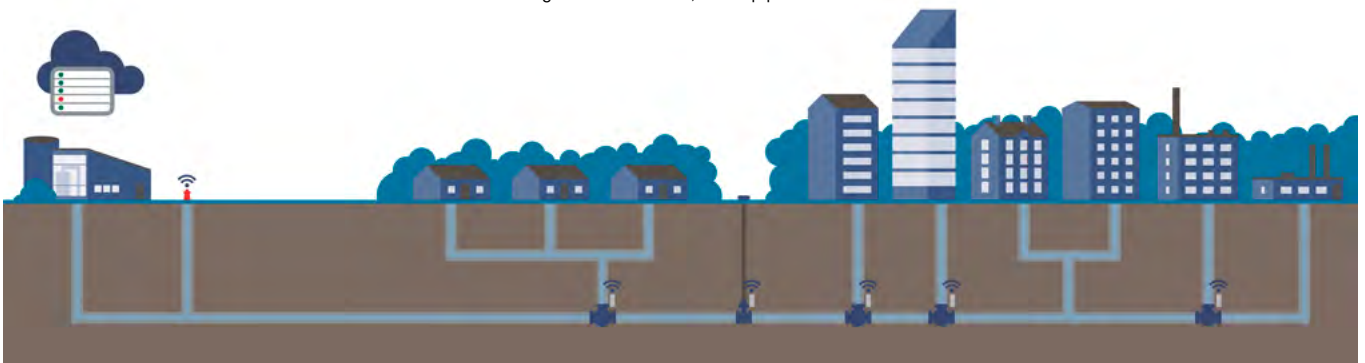
To ensure reliable data for water balance calculations, VIDI positioners have been installed as part of the LEAKman demonstration facilities at HOFOR, at three strategically important shut-off valves acting as boundary valves between DMAs. The VIDI Positioner is an IoT sensor that indicates the degree of open or closedness of the valve, and it reports any operating activities opening or closing the valves. Data is automatically sent to HOFOR at regular intervals and whenever the valve is operated, and the data is easily integrated into a third-party software through an open API (Application Programming Interface).

Pressure adjustment techniques also part of the LEAKman project

Pressure adjustment is considered the single most beneficial, important, and cost-effective leakage management activity. The higher the pressure, the more water is lost through bursts or leakages. Furthermore, most pipe bursts

occur not only because of high pressure, but rather due to ongoing pressure fluctuations forcing the pipes to continuously expand and contract, resulting in stress fractures.

Pressure adjustment is also an efficient way of reducing unnecessary energy consumption. By allowing for a lower pressure in general, especially during off-peak hours, energy consumption for pumping can be reduced. The pressure can be adjusted to the critical point at a strategical consumer in the DMA, which means that no energy will be used to pump water to a higher level than necessary.



OPTIMISING WATER RESOURCES THROUGH INTELLIGENT IRRIGATION

Constant demographic increase requires a larger production and/or a conversion to more plant-based food production in agriculture and, thereby, a more sustainable management of food production. At the same time, water shortage is an increasing problem globally.

More sustainable use of water resources in the irrigation industry

It is necessary to optimise available water resources, intensify agricultural production in a sustainable way, improve water networks to avoid leaks, and find more sustainable, intelligent, and controlled solutions in the use of water for irrigation. Many countries have started allotting funds to sustainable use of water resources.

Irrigation is the artificial process of applying controlled amounts of water to plants at regular intervals. It is used to assist in the growing of agricultural crops, maintenance of landscapes, frost protection as well as revegetation of disturbed soils in dry areas – i.e., during periods of inadequate rainfall.

For example, in Spain, the irrigation sector will receive the contribution of over 2,137 million euros until 2027 from the Spanish government as part of the Recovery, Transformation and Resilience Plan. In Italy, investments are planned in the resilience of the irrigation agrosystem for a better management of water resources (National Recovery and Resilience Plan) for 880 million euros. Also in Italy, they plan to dedicate 15 billion euros to a more





sustainable handling of water resources near larger water works and water supplies for irrigation and drinking water.

“Globally, 70% of all fresh water is used for agriculture.”

Source: [The World Bank](#)

AC.MO offers management and control of irrigation water distribution

The Italian AVK company AC.MO offers an opportunity to work towards a more economically and environmentally sustainable irrigation process. AC.MO offers a wide range of products and intelligent solutions to optimise the use of water resources and irrigation planning, and has developed a specific system to manage and control irrigation water distribution. This intelligent irrigation system is called HYDROPASS. A growing number of water authorities are using our system and are achieving excellent results in terms of water and energy saving.

“Nearly a third of all food produced each year is squandered or lost before it can be consumed.”

Source: [World Food Programme \(WFP\)](#)

HYDROPASS is a surveillance and controlling system for irrigation where the user can optimise based on proper planning. The system can be connected to national geodata, delivering information about the soil's status at the time of planned irrigation, and about the local weather forecast carrying valuable data about approaching rain showers. HYDROPASS also keeps track of water usage, and in case of alerts, it can shut down any activated irrigation.

Analysis of the strategic environmental management

AC.MO, in collaboration with Padua University, Italy, has started a project in which a scientific framework will be developed and implemented to support the environmental excellence of the HYDROPASS system compared to traditional irrigation methods. This investigation will allow the drafting of a water statement in accordance with ISO 14017, which involves environmental management incl. requirements with guidance

for verification and validation of water statements. The project involves, among other things, data collection together with farmers, to build the LCA (Life Cycle Assessment) model for comparison between traditional irrigation systems and HYDROPASS. The publication is scheduled for the end of 2022.

LCA (Life Cycle Assessment)

LCA is a process of evaluating the effects that a product has on the environment over the entire period of its life thereby increasing resource-use efficiency and decreasing liabilities.

Source: [EEA - European Environment Agency](#)



WASTEWATER AS A RESOURCE

Technologically advanced countries use wastewater as a resource by using the sludge to create energy. This could be in the shape of biogas used to run public transportation and so cleanse the air in the cities, or it can be converted to electric energy and heat. This means that there is every reason to consider wastewater a resource rather than a problem, and in this area, Denmark is a pioneer in creating an energy neutral water industry.

Wastewater as a source of energy

The Danish water sector aims to be energy and climate neutral by 2030, supporting the government's goal of reducing the country's total CO₂ emissions by 70%. This means that all Danish water treatment facilities must produce their own energy, ideally to an extent where they can sell excessive electricity to the water supply and excess heat to the district heating network. In the annual report 2021 for the largest wastewater company in Denmark, BIOFOS, it states that larger Danish cities are already in progress and that the best facilities produce up to 75% more energy than required at the water treatment facility itself.



Our products as part of green energy production

Through decades, the Danish water industry has built up an expertise within energy efficient technologies and solutions for water treatment plants, and AVK has been part of the solution with our thoroughly tested valves and other equipment. By exploiting the sludge from the wastewater, it is possible to produce biogas which in turn can be transformed into electrical energy via a gas engine running a





generator. Optimising the output to as much electrical energy as possible has been key but it is equally important to review the amount of energy used for treating the water. In a collaboration with the company Linak, AVK has developed a valve with a low-energy actuator (in comparison with similar traditional valves).

Potential for energy savings

September 2022 saw the publication of the [report](#) "Analysis of the potential contribution to energy and climate neutrality from Danish technology within the global wastewater sector" created by DHI for DI Water (DI = Confederation of Danish Industry). DHI is an international consultancy and research organisation, specialising in the aquatic environment. The report explains that if all current and future wastewater treatment plants in the world would do as we do in Denmark, then we could save approximately 300 million tonnes of CO₂, which is 12 times the total amount emitted in Denmark in 2020. Based on the energy situation before the current crisis, this corresponds to saving 20 billion euros on the



electricity bill, and if the energy crisis continues, the savings made could be as high as 200 billion euros. For comparison, this reduction corresponds to the emission of all coal-powered plants in Europe.

In World Energy Outlook 2018, the IEA pronounced that if all countries worldwide did as we do in Denmark, all coal-powered plants in Europe could be closed.

The UN Environment Programme, UNEP, which is the leading environmental authority in the UN system, states that some 80% of all man-made wastewater is directed back into the environment without any kind of treatment or cleaning ([unep.org](https://www.unep.org), 2019).

In addition, the IEA, the International Energy Agency ([World Energy Outlook, 2018](https://www.iea.org)) has made calculations that show that untreated wastewater impacts our climate three times as much as treated wastewater in terms of greenhouse gas emissions.



ENVIRONMENTAL WATER MANAGEMENT SOLUTIONS FOR RESILIENT FLOOD PROTECTION



One of the six environmental objectives laid down by the EU Taxonomy Regulation is climate change adaptation.

Climate change refers to long-term shifts in temperatures and weather patterns which impact the environment by, for example, melting the ice at the Poles, changing currents in the oceans, and changes in the hydrological cycle, such as heavy rainfall. Increased rainfall and fluctuations between heavy rain and drought make the ground impermeable and so the excess water must be collected by an underground drainage system. A poor drainage system can cause flooding, resulting in property loss and possibly causing people to relocate to avoid the floodwaters. Flooding can also wreak havoc on water supply infrastructure and pollute domestic water supplies. Therefore, water flows must be controlled by means of environmental water management solutions.

Glenfield Invicta and the Orbinox Group, consisting of companies in 12 countries, can contribute by designing, supplying, and installing penstocks, valve solutions and associated control mechanisms. Concrete examples are the three case stories in the next sections.

CASE STORIES

Dubai South

To assist Dubai in tackling stormwater issues, a deepwater drainage project has now reached its pre-operational stage. The solution will support sustainable processes as well as the marine environment in the area. AVK Gulf and Orbinox delivered the valve solution for the system's pumping station.

Storms, heavy rain, and flooding has previously caused damage and disruption in the area. In the hope of mitigating the effects, an extensive drainage solution was initiated. Exhibited as one of the most important infrastructure projects in Dubai, the stormwater system will serve the whole of Dubai South. The system will collect stormwater and surface water from a total area of 500 km² – equivalent to around 40% of the entire urban city – transporting water through a 10.3 km long tunnel with an internal diameter of 10m and a depth of 40-60m.

The tunnel ends at the terminal pumping station near Jebel Ali Port, where water is drained through a double system, which can drain excess water through pumps connected to lines extending 600m into the sea with high operational efficiency. This makes the main pumping station highly integrated when it comes to services, buildings, and facilities in the management of stormwater drainage as well as surface water.

Lee Tunnel

A decade ago, an average of 39 million tonnes of untreated sewage was discharged into the River Thames and its tributaries on an annual basis. The discharges were caused by flooding incidents which led to excess sewage being discharged into combined sewer overflows and, eventually, into the River Thames. By early 2025 it is expected that this figure will be reduced by around 96% to 1.5 million tonnes. The works to achieve this include the upgrade of Beckton sewage treatment works, the Lee Tunnel, and the Thames Tideway Tunnel (to be completed in early 2025).

Glenfield Invicta was a key technical partner in the Lee Tunnel works, supplying and installing 19 penstocks and 12 flap valves over an 18-month period. Before design works could begin, site surveys were undertaken on existing structures to ensure dimensions were accurate. The penstocks installed by Glenfield Invicta are among the largest seen in the UK measuring up to 4.8m x 5.2m. Completion of the Lee Tunnel alone reduced the discharge of untreated wastewater by 16 million tonnes.



Keadby Pumping Station

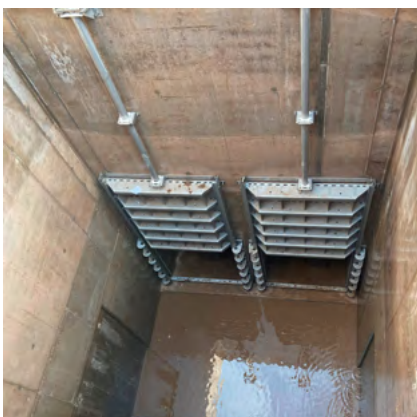
Keadby Pumping Station is located alongside the tidal River Trent south of the Humber Estuary on England's east coast. The pumping station is integral to a four-hundred-year legacy of sustainable agricultural drainage activity. Without the pumping station excess water from the River Trent during high tides and flood events would overflow into local tributaries submerging valuable arable land.

Glenfield Invicta has designed, supplied, installed, and commissioned the penstocks, flap valves and associated control mechanisms integral to the upgrade of the pumping station.

The 18 penstocks are manufactured from stainless steel grade 316Ti (a titanium stabilised

austenitic stainless steel) which is resistant to corrosion. This increases the operational life of the penstocks, enhancing the sustainability of the pumping station. For ease of operation, 12 of the penstocks are linked to electric actuators by 8m extension spindles.

The river Trent and tributaries are rich in biodiversity and the flap valves and pump designs are 'fish friendly', allowing safe navigation of fish and eels on their natural migration. For example, the flap valves incorporate a 'fish friendly' spring damper system, each consisting of eight stainless steel springs, which controls the closure of the valves. The system ensures the flap valves remain open for a short duration as the tide rises allowing the fish and eels to pass through.



The EU Taxonomy Regulation is a classification system, establishing a list of environmentally sustainable economic activities. The EU taxonomy should create security for investors, protect private investors from greenwashing, help companies to become more climate-friendly, mitigate market fragmentation and help shift investments where they are most needed. The Taxonomy establishes six environmental objectives:

- Climate change mitigation
- Climate change adaptation
- The sustainable use and protection of water and marine resources
- The transition to a circular economy
- Pollution prevention and control
- The protection and restoration of biodiversity and ecosystems.

Source: [European Commission](https://ec.europa.eu/economy_finance/eu-taxonomy-regulation_en)



HYDROPOWER: THE NATURAL FLOW OF MOVING WATER TO GENERATE ELECTRICITY

Hydropower is one of the oldest sources of renewable energy that uses the natural flow of moving water to generate electricity. AVK Valves in Anhui, China, and the Orbinox group of companies offer a complete range of valves for hydropower plant applications. Their product portfolio covers valves for all elements of barrage facilities.



CASE STORY

Orbinox has participated in the largest hydropower project in Portugal called the Tâmega Hydroelectric Complex. The Iberdrola Group, one of the main Spanish electrical utilities, has invested more than 1.5 billion euros in constructing the Tâmega hydroelectric complex in northern Portugal. The project has involved the building of three dams and three hydropower plants, Gouvães, Daivões and Alto Tâmega, with a combined capacity of 1,158 MW, which will represent an increase of

6% of the total amount of electricity produced in the country.

ORBINOX has been the supplier of hydro-mechanical equipment for the bottom outlets of Daivões and Gouvães dams, as well as the fixed cone valves for the Gouvães dam. The construction work was initiated in 2015, and our products have already been successfully commissioned. All three dams are expected to be operational by 2023.

WARM WATER FROM INDUSTRIES CONVERTED TO DISTRICT HEATING

Wouter Witzel, a dedicated member of the AVK Group, is supplying butterfly valves for an underground pipeline project called “WarmtelinQ”. In the beginning of 2022 the construction has started, and the DN700 pipeline will transfer warm water from the port of Rotterdam, the Netherlands, to

the surrounding cities. The warm water is generated by industries in the port, for example garbage incineration installations. The warm water is mainly used for district heating of homes and companies but will also be used for warming the greenhouses in the Westland area. The project is designed in a way that it can

be expanded in the future by both connecting other industries or plants to the pipeline and by extending the distribution network throughout the region. It is expected that the expansion to other areas can begin in 2025.



Caption of the water cycle:

It is important to consider the water process in its entirety, including all applications and users. The illustration demonstrates how SDG 6 covers the holistic water cycle from clean drinking water, sanitation, wastewater, water consumption and management of water resources and eco systems.

[Read more here.](#)



BIOGAS TURNS WASTE INTO ELECTRICITY



Biogas is a mixture of gases, primarily consisting of methane, carbon dioxide and hydrogen sulfide, produced from raw materials such as agricultural waste, manure, municipal waste, plant material and sewage. It is a renewable energy source that is produced by anaerobic digestion with anaerobic organisms or methanogen inside an anaerobic digester, biodigester or a bioreactor.

Anaerobic digestion occurs in sealed vessels called reactors. The AVK company Orbinox has developed knife gate valves used in the organic matter feeding lines (animal manure, wastewater biosolids, food). The EB series of bi-directional knife gate valves are for instance a perfect choice of anaerobic digestion gate valves to meet the most demanding slurry

feedstock and digestate applications. Other AVK companies like Wouter Witzel and InterApp also supply valves that are used for biogas. The advantage of biogas is that it can be stored. Society shows increasing electrification and hence an increased need for biogas to ensure a reliable supply of green energy.



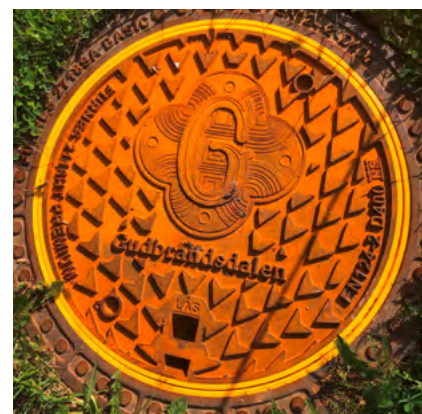
CAST IRON CONVERTED INTO NEW PRODUCTS

At the AVK company Furnes Jernstøperi in Norway, 97% of the materials used for new products consist of recycled cast iron. Therefore, since 1958 the company has recycled tons of post-consumer material into new useful products. All products have long-lasting functionality, low maintenance cost and can be recycled.

Furnes Jernstøperi calculate their CO₂ emission based on LCA (Life Cycle Assessment). In the beginning of 2021, they were the first foundry in Europe to introduce Environmental Product

Declaration on their production of grey and ductile cast iron.

The foundry uses energy from the nearby hydropower plants in Hallingskarvet and Hardangervidda in Norway. This means that the whole production runs on renewable energy. By attaching an extra guarantee of origin to the contract to the hydropower plant, Furnes ensures that all electricity used at the foundry is produced from an energy source that is 100% renewable.



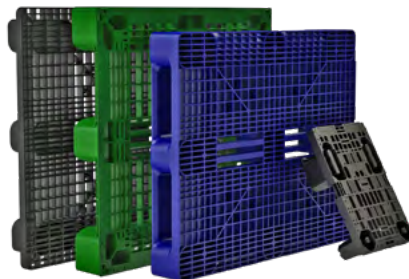
An Environmental Product Declaration (EPD) transparently reports objective, comparable and third-party verified data about products and services' environmental performances from a life cycle perspective.

Source: [EPD International](https://www.epd-international.com/)



RECYCLED PLASTICS IN OUR PRODUCTION

Recycled plastics is an important component in the product manufacturing process of AVK Plastics' group of companies, which in turn is part of the AVK Group. Thousands of tonnes of recycled plastics go into production every year.



AVK's plastics companies deal with the development, manufacturing and sale of injection moulded plastic products such as valves, street covers and components for the sister companies in the AVK Group. In addition, the plastics companies also contribute products to other market segments, such as waste containers and plastic pallets. AVK Plast in Denmark manufactures ergonomic waste containers for Danish municipalities, renovators, and citizens. The pallets, which are produced in the Netherlands, Denmark, and Germany, use the majority of our consumption of recycled plastics.

How AVK recycles plastics

Recycling is a primary concern for AVK. Our plastics companies focus on the use of recycled plastics from consumer waste and processed around 27,000 tons in the financial year 2021/22. For reference, 27,000 tonnes of material is about 400 sea containers of 12m in length.

AVK Plastics in Balk, the Netherlands is the largest plastics manufacturing facility of AVK and is fully dedicated to processing recycled plastics and actively pursues partnerships to develop applications for plastics waste streams to ensure an increased level of recycling.

According to a recent study of Plastics Europe called "[the circular economy for plastics – a European overview](#)", 2022 edition report", about 65% of plastics waste in the EU countries is not yet included in the circular economy.

Energy consumption in the production

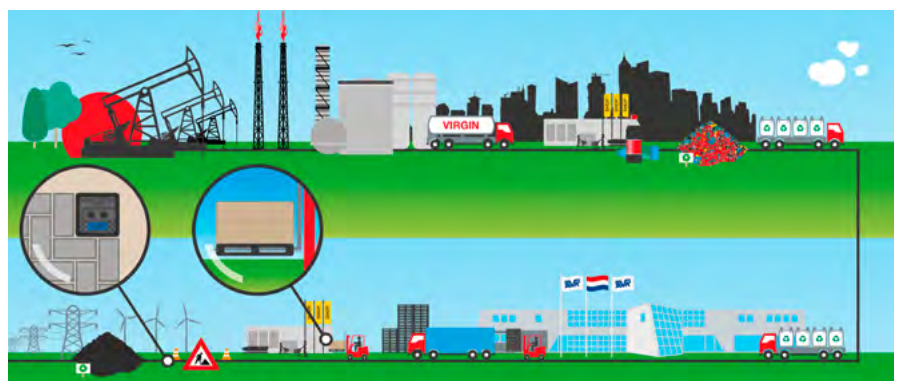
Injection moulding of plastic products is quite energy intensive, as plastic raw material needs to be molten, in general requiring heating above 200° C, to be subsequently injected under high pressure into a forming mould, before being cooled so the plastic solidifies, delivering the desired stable product geometry.

AVK Plastics makes a continuous effort to reduce its specific electricity consumption through optimisation of processes and machines. In its operations in Balk, the Netherlands, and in Wujiang, China, a reduction of 15 to 20% has been realised over the last

two years. Waste heat from production is used for on-site heating purposes and can potentially be used as an additional supply to public heat networks.

For many years, AVK Plastics has calculated the CO₂ emissions of surface boxes and pallets based on LCA (Life Cycle Assessment) and makes those values available to customers. An essential part of the business strategy for pallets is regional production and sourcing of recycled materials. This way, transport distances and hence associated CO₂ emissions are minimised.

In accordance with the AVK Group policy, all AVK Plastics manufacturing sites are currently investigating the placement of solar panels on-site to contribute to the generation of renewable energy.



INNOVATION AND DEVELOPMENT WITHIN OUR BUSINESS AREAS



In the AVK Group, innovation and development of new and improved high-quality products with a long lifespan and recycling in mind, play a crucial part. As described on the previous pages, our innovative solutions are many and versatile and they are part of various industries.

For instance, this is true for valves and Smart Water solutions for water supply systems and intelligent irrigation, valves for wastewater treatment, for eliminating excess water to avoid flooding, for distribution of hot water, as well as for valves for the production of hydropower and biogas. On an ongoing basis, we strive to use more and more recycled materials in our production.

We constantly work on improving and developing our product portfolio. In a collaboration with FORCE Technology that specialises in this area, we have developed special tests of gas valves to simulate long-term effects of hydrogen in connection with the Power-to-X-transition. This ensures that our gas valves are adequate for hydrogen.

Power-to-X (PtX) is defined as the process of turning green electricity into hydrogen or other hydrogen-based PtX products.

Source:
[DTU Technical University of Denmark](#)

Also, we have just inaugurated the Desalination Competence Centre AVK Group in the company InterApp in Madrid, Spain, as this will be a

business area that we will develop in the coming years. In other words, we remain attentive to developing innovative solutions while entering partnerships.

Innovation is one of our core values and we want to invest in innovative technologies and new business areas that contribute to the green transition.



OUR ENVIRONMENTAL AND CLIMATE EFFORT

As a Group of companies within industrial manufacturing, we are aware that some of our production companies have resource-intensive production processes. Therefore, we continuously work hard to reduce our environmental and climate impact. We continuously look to find ways to reduce our energy consumption, to include materials and products in recycling processes, to expand the use of renewable energy sources, and to handle waste in an environmentally responsible manner. Our ongoing improvements are documented by collecting data and setting targets for improvement.



Environmental and climate strategy

Already, we have pinpointed specific areas of attention within these areas:

- Reduction of CO₂ emission according to Scope 1 and 2
- Increasing the extent of application of renewable energy sources
- Mapping, tracking, and measuring the CO₂ emissions in our operations and per product
- Ensuring a positive communication among our employees, our customers, and other stakeholders, to achieve the commitment required to succeed.

Our own companies and selected suppliers must consume less energy. This is the reason we are going to implement processes and activities that help us move towards:

- Minimum energy consumption as a core criterion of the design and production process
- Low energy consumption as a preference for investments
- A fixed level of investments that are earmarked for energy-saving
- Implementing ISO 50001 on energy management no later than 2025.

Tracking and measuring CO₂ emissions of the entire product life cycle

When analysing, tracking, and measuring the CO₂ emissions in relation to our products, processes, building and value chains, we address both the CO₂ emission of operations and per individual product. As for our products, we will address the entire life cycle from cradle to grave in accordance with the UN SDG 12 on sustainable production.

For our production companies we will initiate a mapping of the energy consumption of the production processes. We will continue to review and implement incrementally to improve individual processes with the purpose of lowering both direct and indirect energy consumption. This will happen through local energy inspections that will enable defining best practice and working procedures for the AVK companies. To ensure relevant implementation and maintaining energy improvement initiatives, we will in the years to come, increase the share of certified companies according to the energy management system ISO 50001.

Greenhouse Gas Protocol (GHG)

The Greenhouse Gas Protocol (GHG) is the leading international standard for measuring and reporting emissions as CO₂ equivalents (CO₂e). These are measured according to three different kinds of emission, referred to as Scope 1, 2, and 3.

Scope 1

Direct emissions from activities that the company controls, i.e. emissions from their own vehicles and facilities for heating and energy production.

Scope 2

Indirect emissions from supplied energy, including electricity and district heating. The emission happens elsewhere, e.g. at local heat and power stations or district heating plants.

Scope 3

Indirect emissions from the company's value chain.

Source: [Klimakompasset](#)



Initiatives based on the strategy

Life cycle assessments

In terms of LCA (Life Cycle Assessment) we have started a global initiative to create exact calculations of CO₂ emissions throughout the entire value chain of a given product. This way, we can build up an essential data volume that can help us map how minimal energy consumption and minimal CO₂ emission can become a core criterion of the design and production processes.

By looking at our products from the perspective of the entire life cycle we can concentrate the environmental efforts on those areas where we can achieve the best environmental benefit. These life cycle assessments will also enable delivery of fact based and verified documentation to those customers who wish to know the CO₂ emission of a given product.

Increased use of green energy sources

Presently, the share of green electricity amounts to 29% of the combined energy consumption of the entire AVK Group. In our effort to reduce CO₂ emissions, we want to produce and buy green electricity. Some of our companies, such as Furnes Jernstøperi and AVK Plast, already use 100% green energy.

We have decided to set fixed investment criteria on Group level, mainly for solar and wind energy projects. It is part of our environmental and climate strategy that factory facilities must be equipped with solar panels. Therefore, we have in AVK Holding established an advisory function within this area.

Various investments in solar panels are already in the process of installation. The facility at InterApp Valcom in San Agustín de Guadalix, Spain, produces 164 MW and covers 34% of the annual electricity consumption. The facility

at AVK International in Skovby, Denmark, produces 857 MW, reducing our CO₂ emission by 128 tonnes per year and covering 31% of the annual electricity consumption. At AVK Gummi in Låsby, Denmark, we have installed a 252 MW facility, covering 3% of the annual electricity consumption. Equally, the new AVK Holding headquarter in Galten, Denmark, will be fitted with solar panels on the roof.

We are looking into establishing more solar panel facilities in Europe, Africa, and the Middle East.



Calculating CO₂ emissions

For three years, we have been measuring Scope 1 and 2 according to the Greenhouse Gas Protocol (GHG). As demonstrated by the graph below, our CO₂ emissions have decreased over the past four years. In total, the Scope 1 emissions have increased during the financial year 2021/22, in part because our expansion and acquisition of production capacity has increased the consumption of natural gas, in part because, unlike previous years, this year we have included our internal transport in Scope 1. Scope 2 on the other hand is decreasing as we have increased the share of purchased renewable energy and self-produced power via solar panels. See Figure 1 here below.

We have initiated a global initiative on LCA (Life Cycle Assessment) to collect calculations of CO₂ emissions throughout the value chain of a given product. In extension to this we will define and calculate the company's selected significant emission according to Scope 3 and initiate all necessary actions to reduce the CO₂ outlet.

Other environmental and climate initiatives

Our approach to reducing the energy consumption includes energy audits, replacing equipment with more energy friendly variants and improving operation processes. We will continue to update the LED lighting at all facilities and use programmable lighting and temperature control at all offices and facilities. This happens through energy inspections with the purpose of gathering best practice and identifying innovative ways of saving and recycling energy. When we expand our production capacity and facilities, energy improvements are considered carefully.

Below are three examples of energy improvement projects:

At Wouter Witzel in the Netherlands, the energy consumption has been reduced by isolating the vulcanisation press used in the production of butterfly valves. This means energy savings of 40% and 59% respectively on small and large presses.

At AVK Plastics, also in the Netherlands, 9 capacitor banks have been installed on our injection moulding machines. The annual savings amount to 4,7% of the power consumption (506,275 kWh), corresponding to a reduction of 268,000 kilos CO₂. This technique should be considered in future investments for all factories that use large electrical engines.

At AVK Syntec, China, the power consumption has been reduced by 13% on injection moulding machines by replacing ceramic heating rings with nano heating rings. This improvement has resulted in a better working environment for those employees that work in the area, because of the subsequent temperature reduction. Specifically, the surface temperature has fallen by 70%, heating time is reduced by 20% and power consumption to preserve the temperature is reduced by 54%.

These three examples have been collected through an established LEAN process for knowledge sharing in AVK where all companies submit their improvements to inspire others. In the coming years, we will intensify energy improvements, integrate LEAN even more in our decision-making processes and so pay even more attention to knowledge sharing on environmental improvements to reduce the power consumption, the environmental impact and increase profitability.

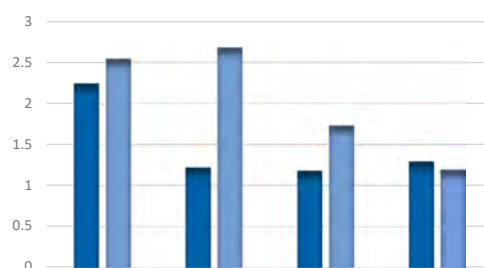
Recycling and circularity

At those factories and foundries where we work with the environmental management system ISO 14001, we have implemented waste reduction and recycling programmes. This means sorting waste into the right waste fractions and ensure efficient recycling.

Internally we have initiated a data collection project to get the full overview of the total amount of waste in our Group of companies. This includes both the waste that is reused and recycled, and the non-recycled waste. As we achieve a valid amount of data, we will start monitoring the handling and performance at the individual sites.

It remains our goal that >80% of our waste should be recycled and reused while non-recycled waste may only comprise <20% of our total amount of waste in the financial year 2022/23.

To achieve this goal, we will continue to identify methods and processes to reduce waste and to reuse and recycle materials in our factories. It is our expectation that our work with life cycle



CO ₂ emissions	unit	2018/19	2019/20	2020/21	2021/22
Scope 1	tonnes CO ₂ per DKK million (turnover)	2.25	1.22	1.18	1.29
Scope 2	tonnes CO ₂ per DKK million (turnover)	2.54	2.68	1.73	1.19

Figure 1

assessment will lead to the identification of new materials for recycling. This identification will happen both internally in the Group and in close co-operation with our suppliers.

Overview of water, heat, and power consumption

The charts below show the AVK Group's consumption of water, heat, and power over the last four years.

Despite an increased turnover, our total power consumption has only increased by 4% while the total power index shows -11.52% compared to the year before. Water consumption has increased in a few AVK companies while the total water consumption index shows -5.23% compared to last year. In future years, we will work on reducing water consumption in these AVK companies. The consumption of natural gas has increased because of the expanding production capacity at gas-heated factories

and because of acquisition of gas-heated companies. The total gas consumption index is 0.27% compared to last year. See Figures 2 and 3 here below and find more explanations in Table 1 in the appendix.

Future areas of attention

In 2023 we want to determine the calculation method for CO₂; a method which like the current, will comply with the GHG protocol. We will also be implementing the above-mentioned processes and activities that result from our strategy. Specifically, the aim is to ensure a minimal power consumption and environmental impact and so apply this as a core criterion of the design and production process by means of life cycle assessments. Another aim is to implement ISO 50001 and apply low energy consumption as a preference for investments and target investments at energy saving.

We plan the following activities in the coming years to reduce our environmental and energy impact:

- Map significant energy resources and energy optimise our production processes and equipment
- Implement additional solar panels at our factories and purchase certified renewable energy
- Implement ISO 50001 and develop the right production processes within energy management
- Phase out the use of gas in our production to the widest extent possible and switch to heat pumps
- Continue our efforts to recycle materials and products.

For the coming financial year, energy data will be an integrated part of our management reporting and so be part of the monthly reporting and follow-up.

We are aware that anchoring sustainability in our core business will mobilise our employees in our efforts and in this way we can create an authentic, engaging, credible communication that includes knowledge-sharing which may be the foundation for even more sustainability initiatives.

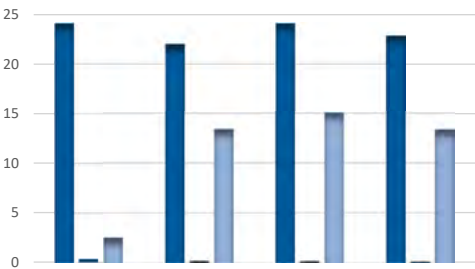


Figure 2

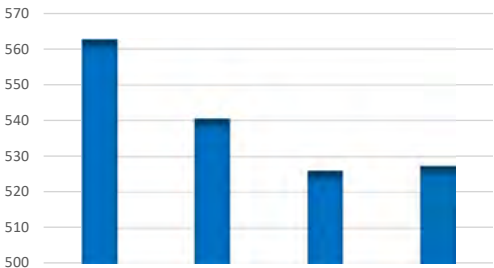


Figure 3



SUPPLIER MANAGEMENT AND CO-OPERATION

Based on the challenges of the financial year 2021/22 in terms of supply of materials, energy resources of our suppliers, covid-19, and not least the vast global logistical challenges, an important area of attention has been our line of suppliers. Our top priority has been to fulfil existing agreements and ensure timely and responsible delivery to our customers.

This area has required additional efforts to ensure that both existing and new suppliers have been able to supply deliverables while fulfilling the agreed requirements and standards.

Despite major challenges in our supply chain, we have been able to supply our goods to our customers, and to find new suppliers and integrate them well. These suppliers have been subjected to our regular approval processes, including audits to ensure responsible behaviour.

Quality and responsibility

Quality and responsibility are always decisive in our supplier management and co-operation. We only work with suppliers that guarantee compliance with all legislation on safety, environment, climate, and human rights. We always choose suppliers that comply with local environmental and labour law, and they must live up to our ethical standard, our Code of Conduct, to be approved as an AVK supplier.

We work consistently and systematically on registering, controlling, following up on, and developing our supplier co-operation to ensure that our Group Policies, including the Code of Conduct, are always complied with.

Code of Conduct

With the specified supplier requirements and the Code of Conduct, we want to make sure their environmental impact is not larger than necessary, that they respect human rights, and that they do not use forced labour or child labour. The AVK Code of Conduct is an integral part of our purchasing agreements with suppliers, it is part of our standard terms and conditions for purchase and must be accepted for all purchase orders.

If an AVK supplier or collaborator does not comply with our Code of Conduct, we will initially reprimand them and initiate a dialogue to improve. In case of repeated violations against our Code of Conduct, we will terminate the co-operation.

Auditing

Supplier audits are carried out according to a set programme. The frequency of audits is based on a country and product-based risk assessment which is described and managed in our internal QHSE documentation.

Internal AVK auditors perform the audits and always verify the ISO and third-party certifications we require from our suppliers. We use a check list that covers various topics and areas, and which we continue to improve. Naturally, we pay particular attention to



countries with an increased risk of violating social and environmental responsibility.

In the financial year 2021/22 we have performed 24 supplier audits. There were no incidents among the audited AVK suppliers that called for reprimands or other measures.

Goals and activities

We maintain our goal to further implement the Code of Conduct activities in relation to suppliers in new countries and regions.

We have added new resources to the Danish and global quality and sustainability functions and so in coming years, we will be able to strengthen our efforts within responsible supplier selection and approach to Code of Conduct.

In the coming years, our environmental requirements to the suppliers will increase, not least because of our work with the GHG protocol's (Greenhouse Gas Protocol) Scope 3 and our work with product declaration such as EPD (Environmental Product Declaration) and LCA (Life Cycle Analysis). The work with these initiatives has commenced this year.



OUR SOCIAL RESPONSIBILITY

EMPLOYEES

As an international Group of companies, we are very serious about our social responsibility. This means that we contribute with attractive jobs and want to establish the best setting for the development and well-being of our employees.



We adhere to the UN declaration of human rights, including equal rights independently of gender, religion, political views, etc. The obligation to comply with the human rights is included in our Ethical Policy, in the defined principles of the AVK Group as well as in our guidelines. It is also an important part of the basic values of management.

We have implemented the internationally recognised occupational health and safety standard ISO 45001 in the largest production companies to ensure and improve the health and well-being of the employees. The purpose is to systematise the efforts on the working environment and ensure ongoing evaluation and improvement. The system is also mentioned in the section on safety and in the appendix.

Anti-corruption

AVK distances itself from all types of corruption, including blackmailing and bribery. We do not tolerate such incident and consider them gross misconduct that may result in disciplinary or other actions.

General Managers of the companies of the Group have signed a compliance agreement as part of their employment which entails

a requirement to respect national and international legislation on anti-corruption and bribery.

We are not aware of any instance of non-compliance with anti-bribery and anti-corruption in the year 2021/22.

Report on Data Ethical Policy

As a result of digital development, the AVK Group relies ever more on data to run its business. Data security, privacy and data ethics are elements of a responsible data culture. Therefore, AVK has established a Data Ethical Policy in the year 2021/22. Our Policy is based on the recommendations of the Danish Data Ethical Counsel and the Policy is the first step towards implementing data ethics in the AVK Group.

The purpose of our Data Ethical Policy is to ensure compliance with existing legislation and to protect our data in accordance with best practice. In the way we handle data, we want to respect people, always keeping in mind equality, dignity, and freedom to ensure that the data handling of AVK actively promotes the health and well-being of people.

The Policy has been made available in the intranet of the AVK Group. In the coming year, we will work on implementing the Policy to a broader extent in the AVK Group to ensure

that the values of the AVK Group are reflected in the way we manage data. As part of the implementation, we will see to it that the data ethical guidelines become integrated in the business processes among our employees.

Our employees

The AVK Group employs more than 4,800 people across the world. We are a pluralistic Group of people with different backgrounds, educationally, culturally, etc.

Our employees are a priceless resource. We are aware that we are operating within a





competitive industry, and it is crucial that we constantly improve the products and processes to be able to offer high-quality solutions that match the needs of our customers. This requires a close collaboration throughout the organisation, and it requires our employees to constantly develop professionally and personally, and this is why we are proud to offer a stimulating and challenging place to work.

Report on unequal gender representation in management

When managers are hired and appointed in the Group, the guiding principle is that the person best qualified for the job is employed. We must, however, recognise that our industry with its technical and industrial products has traditionally been favoured by men and so we have an unequal distribution of the genders both at management level and generally. This means that we have a responsibility to make our company more attractive to women.

We participate in the national campaign, 'Girls' Day in Science', which has been initiated to draw attention to the lack of women within IT, technology, science, and mathematics. As part of this campaign, we invite local girls to an event at the AVK Academy & Visitor Centre to stir an interest in our industry and to meet female employees.

The share of women on the board of AVK Holding amounts to 20% which is in accordance with our goal. There are no women among senior management, while the gender distribution at other management levels amounts to 25%. AVK Holding consists of four departments and three staff functions. The four departments have fourteen sub-departments. In the departments and staff functions, there are twenty department managers, five of which are women.

On a long-term basis, our goal is to increase the share of female managers to 30%. Currently, it is an aim for the management that women are represented at the final job interviews for management positions in AVK Holding. We are also aware of gender equality when promoting managers from within our organisation.



OUR SOCIAL RESPONSIBILITY

EDUCATION

Within education, we also take our social responsibility seriously. AVK is a decentralised organisation in which the management of each company is largely responsible for educating the employees. Despite this, at Group level we have a desire to contribute to a culture of knowledge throughout our organisation.



Educating employees

We strive towards achieving a culture of knowledge by making it easy for our employees to update their knowledge and strengthen their competencies. We do this to help them feel equipped to perform their job and act according to the values of the AVK Group. This is the reason we have developed an elearning universe for all employees, the AVK Academy. The AVK Academy is an increasingly important part of the employee training. It forms part of the process of onboarding new employees and of the ongoing training of employees. It furthermore provides a platform for management to supply online training to a large group of employees, as is the case with for example IT Security.

As mentioned in the section about occupational health and safety, all blue-collar employees must complete a safety training module to avoid accidents. New key employees in the Group participate in in-depth introduction course to provide a thorough insight into AVK and our expectations to them as managers. Because of covid-19, in the financial year 2021/22 the course was held online. We always have trainees and students among our employees.

We want all our employees to develop during their employment, and we want them to thrive and maintain their commitment. Therefore, education and training is key to us.

Educating the next generation – Advanced Water Cycle Management Course

We not only focus our attention on the education of our employees. We believe it is our responsibility to educate the next generation of employees and partners; to create a forum where we can share the most recent knowledge, technologies, and trends within the water industry.

Therefore, we, in collaboration with other companies and utilities from Eastern Jutland, Denmark, who all contribute with knowledge and expertise, have developed the summer school “Advanced Water Cycle Management Course”. This is an international course designed to upgrade the skills of the student within water management and to create an overview of as well as significant knowledge about water resource management, water distribution and wastewater handling, including recycling of resources.

The course is offered by the Centre for Water Technology at the University of Aarhus, Denmark.

CASE STORY

Congratulations to the graduates of Advanced Water Cycle Management

On the last Saturday of August 2022, the students left the AVK summer course with their diplomas in hand, ready to go out and influence the future water industry. The mix of guiding theory backed by semi-practical tasks turned out to be a great way of constructing a “water knowledge upgrade” – for both the participants and the companies involved.

From silo mentality to teamwork

The course content is designed from a holistic view on water infrastructure throughout society; in terms of the energy circle and how to efficiently use our available resources. Once cleaned, water should return to the ground by establishing constructed wetlands, and the energy required to do so should be produced by the wastewater treatment plant itself.





In week two, the course was divided into three thematic tracks of Groundwater, Water Distribution and Wastewater, and each student selected a track based on their individual area of interest.

For the final exam, the students were put into groups based on the track selected, but the groups also had to collaborate to make sure that all chains of the water circle were considered; in fact, this is what the students considered the most important take-away from the course: prioritising to work together across areas of expertise to obtain the most efficient, sustainable solution possible.

The students of the course represented 12 different nationalities, which brought a lot of value to the knowledge sharing process - both regarding cultural differences, local views on products or solutions and environmental concerns.

Katrine – who studies biotechnology engineering: "It was recommended to me that I join the course, and I was happy with both the content and the social aspect of the two weeks; the structure of mixing both groundwater, water distribution and wastewater gave good insights to the complete task of managing water throughout society. And spending two weeks in the countryside was a good way to socialise and network with others from the business."



Alison – an engineer and PhD student (focusing on PFAS in groundwater): "It is very interesting to see and learn from a very different way of looking at water management here vs in the US. Not just the technical details, but also the corporation between the different actors in the industry. In my work with my PhD, the course has also given me a good understanding of the needs and challenges of a water utility."



Mathilde - Water Technology Advisory EU team member: "The collaboration in the Danish water industry is great and inspirational. It is a collaboration that reaches far beyond the Danish borders, with many utilities, institutes, manufacturers, etc. having connections or projects abroad that pave the way for a lot of opportunities."



OUR SOCIAL RESPONSIBILITY

OCCUPATIONAL HEALTH AND SAFETY

Safety in the workplace has always been an area of high priority in AVK. It is important that we look after and care for employees, e.g., through implementation of relevant safety processes and necessary safety equipment at and around the workplaces.



Management systems and working environment organisations

Our larger production companies have implemented ISO 14001 and ISO 45001 (environmental management and management of occupational health and safety) which contributes to our Security Policy, processes, and routines around the efforts of health and safety.

Through implemented procedures and processes, the system of occupational health and safety ensures that we maintain management's attention to minimising the number of workplace accidents and subsequent negative consequences. This happens through causal analysis and the establishment of action plans on security as well as ongoing improvement activities.

Local working environment organisations perform evaluations and improvement throughout the Group, at both office and production facilities to maintain attention to security.

Safety First

Various AVK companies work within process industry or with degrees of manual labour and these are cases where attention to workplace health and safety is particularly important. The processes are not considered high risk, but

accidents can occur. Therefore, Safety First is priority with us.

Through various initiatives, we want to maintain and improve security behaviour among our managers and employees. We want to ensure that no unnecessary risks are taken and that everybody reports near-accidents and helps prevent them.

Some of our latest initiatives are Safety Walks that focus on communication, training and visibility of safety and improvements. It is an important parameter to learn from previous accidents and we use SQDIPP boards (Safety, Quality, Delivery, Inventory, Productivity and People) in the ongoing follow-up.

All blue-collar personnel of the Group must complete safety training.

Working accidents

During the year 2020/21 we successfully reduced the number of accidents (LTA) of our production units by 15% compared to the financial year 2019/20.

Unfortunately, we have registered an increase of the number of LTA's in the year 2021/22, mainly within a few European production facilities. The character of the accidents has changed, and now most of the accidents relate to hand and finger injuries due to manual handling. In the current year, we have had fewer accidents involving foot and leg injuries. We follow this development closely and strive

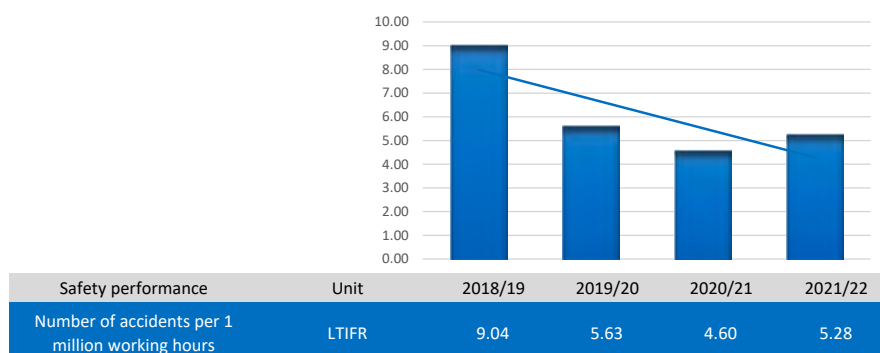


Figure 4

Lost Time Accident (LTA) means any work-related injury which prevents the injured person from doing any work the day after the accident.

Source: [Law Insider](#)



to uncover the cause. When we have done so, we will include the learnings in our global knowledge sharing for 2022/23.

Figure 4 below gives an overview of the frequency rate of accidents. The measuring unit is LTIFR (Lost Time Injury Frequency Rate) and shows the number of accidents per 1 million working hours. The overview shows the recent years and is in relation to the global number of employees.

Goals and activities for the coming year

Everybody must have a safe place to work, and we aim at 0 accidents at all locations in the Group. Over the coming year, we will strive to reduce the global frequency rate of accidents.

The goal for 2022/23 is to reduce the working accident frequency rate from 5.28 per million working hours in 2022 to <4,0 in 2023.

We will continue to pay attention to employee health and safety in the workplace including management responsibility, mindset and employee involvement in the causal analysis and improvement initiatives. We will share best practice between individual locations, assess risks, fortify registrations of near-accidents, and improve our training programme on safety.

CASE STORY

AVK Armadan practices Safety First

Practising safety procedures is important. A fire can be devastating for everybody involved and that is why safety precautions are important.

In June 2022, AVK Armadan performed an evacuation drill. Employees had to abandon what they were doing and gather at the point of assembly when the fire alarm went off. The drill simulated reality and there was even real smoke coming from a room. When an alarm sounds, it is crucial to act correctly and prioritise the safety of the employees. The team passed the test with flying colours.

Safety First is crucial

Fire drills and safety manoeuvres are performed regularly at AVK companies according to the requirements of the environmental standard ISO 14001 and the occupational health and safety standard ISO 45001. The drills are performed according to the size and volume of the factory.

Practice makes perfect and numerous risks must be managed to perfection. Everybody must know exactly what to do in case of an accident or an unexpected event, such as a fire or a chemical spill. Insights into relevant communication with the people involved is also a factor. This is the reason why we perform safety drills; to practice a critical

situation, ensure efficient handling and prevent negative impact of such a situation on people, environment, equipment or buildings. We also learn from such drills and can correct our effort and competences.

All Danish production companies and AVK Holding have contingency plans that are updated regularly, and all certified companies have similar plans.

Psychological working environment

Despite AVK being a decentralised Group of companies where job satisfaction is a matter for each company, we are also a family-owned Group with proud traditions, and it is a virtue to do a good job. We want a safe setting around employee development and well-being and many employees are so loyal that they get to celebrate 25 or 40-year anniversaries with us. To us, this indicates that we are more than just a place to work.

We have numerous social clubs offering events like going to the cinema, the AVK dart or golf championship, relay races, parties, etc. We also involve ourselves collectively with charitable causes.



OUR SOCIAL RESPONSIBILITY CHARITIES AND HUMANITARIAN EFFORTS

The AVK Group is involved with various kinds of charity, handled both locally by the management or through employee involvement. The social responsibility is mirrored locally, nationally, and internationally through humanitarian work.



On our global intranet for the AVK Group, the AVKnet, we often see stories of new charity initiatives to share knowledge and inspire each other.

Local commitment and support to charity organisations

As a global Group of companies, we cannot mention all the charity initiatives of individual companies.

In AVK Holding, we support numerous associations and initiatives that make a difference to society within health, communal spirit, art, culture, and sports. We have chosen to support local elite and non-elitist sports.

The AVK Group contributes to various nationwide collection campaigns, such as “Danmarks Indsamling” (Denmark collects) and we support many charity organisations such as cancer societies, Red Cross, pro-Ukrainian charities, Make-a-Wish Foundation, the World Wildlife Fund WWF, and other associations within muscular dystrophy, heart diseases, etc. We also donate to foundations that support mentally disabled persons or families in need to help them be able to celebrate their child's birthday or to pay their tuition or schoolbooks. Other kinds of support can be food, toiletries, or similar donations to homeless or otherwise needy people. Finally, we support parasport and associations for disabled people, and we collect

waste in the local community or on beaches and partake in donation events.

Fusion Group excels

The AVK companies that are part of the Fusion Group excel by hosting no less than 23 donation events in the financial year 2021/22. The events include dress-up-days such as Breast Cancer Now's “Wear It Pink Day”, and the fundraising event “World's Biggest Coffee Morning”. When celebrating their 50-year anniversary, they threw a gala dinner which included an auction to raise money for several charities. The donations were targeted at hospices, cancer research, Alzheimer's disease, etc.





OUR SOCIAL RESPONSIBILITY

CASE STORY: WATER2NEPAL

Along with other Danish companies, we have donated products to a water supply project in Madi, Nepal. The project is called Water2Nepal and includes the installation of a pipe network to supply 4,000 people with water. The project has been initiated by the non-profit organisation “Jysk Landsby-udvikling i Nepal” (Jysk Village Development in Nepal), financed by the Poul Due Jensen Foundation and managed by the consulting engineering company Envidan.



The current water solution in Madi cannot supply enough water to its inhabitants that have been forced to use surface water and water from wells which can potentially be harmful to their health. Until now it has not been possible to achieve sufficient local endorsement to create a lasting solution.

Tailoring the right solution

Water2Nepal covers the construction of a pipeline network that supply 4,000 people with water every day through a daily capacity of 350 m³. The network covers a 16 km pipeline solution, fully equipped with parts from AVK International, JC Hansen and other project partners.

The purpose of the project is to supply three villages with clean drinking water, to test and practice new technology, to teach and train the new generation of water engineers, and to define the future criteria for the water supply in Nepal. In March 2022 the final contracts were signed. The solution design has been approved, entrepreneurs have been found, and the drilling and construction work has been initiated.

Equipping the local community to take over the operation

Experts from Envidan and Danish water utilities closely monitor all phases of the construction to ensure quality in every step. They also want to make sure that the appointed technicians and supervisors are equipped to assume responsibility of maintenance and operation when the system has been put into service. Much of the technology and hardware are unknown to the local operation crews and ongoing training and education is required to ensure an efficient and sustainable operation. But preparations do not end there; Envidan is to co-operate with the University of Kathmandu and Oxfam to educate future engineers within design criteria for sustainable and efficient water supply in remote areas.

Sustainable operation

The complete solution will consist of a pipeline network, a water tower, solar panels, and technical facilities by the water tower that provide an overview of the current supply situation, including quantities and quality of the water. The system is expected to be ready by early 2024, but inhabitants may see water in their taps as early as 2023 when the wells and the distribution network are up and running.

AVK Valves at a construction site in Nepal

One of the key ingredients to a sustainable water network is reliable, effective, high-quality valves to avoid having to break off vital processes to replace components or perform maintenance. AVK has participated in online working meetings during the planning phase and has offered to donate and ship the valves to the pipeline network. The valves have arrived at the construction site in Madi and are waiting to be installed.



OUR PARTNERSHIPS FOR SUSTAINABLE DEVELOPMENT



It is difficult to make a change if you are on your own. The sustainable transition is to be considered one of the very biggest change management projects that public and private companies, etc. are facing. Therefore, we consider SDG 17 on Partnerships for the Goals essential if we are to succeed with the other SDGs. We co-operate with partners across industries, governments, authorities, the civil community, and the academic world. In recent years, we have had a particular focus on partnerships within the water industry and subsequently within the area of SDG 6. Read more in the next sections about our formal partnerships to promote sustainable development.

The LEAKman concept

LEAKman was initiated to demonstrate how Danish solutions can reduce loss of drinking water and pave the way for new technology. The LEAKman concept has been developed by a confederation of nine Danish partners representing consultants, water supplies, DTU (Technical University of Denmark) and technology suppliers such as AVK.

The purpose of the project is to implement an advanced distribution network by applying thoroughly tested and high-technological products and techniques and by tying together components and management software in integrated solutions to, among others, achieve effective tracking and leak management. The

end goal is to reduce water loss to a level below the national average. The case story about the supply company of Copenhagen (HOFOR) as described in the section on Smart Water is a result of the LEAKman project.

The Ministry of Environment of Denmark has expressed an interest in continuing the project in a 2.0 version via Water Valley Denmark.





Water Valley Denmark

Water Valley Denmark (WVDK) has been created as a co-operation between Dansk Industri (Confederation of Danish Industry), DI Water (sub-unit of Dansk Industri), water supply companies, universities, research units and production companies, including AVK. As of 1 January 2022, the organisation "The Danish water cluster" merged into WVDK. The purpose of the epicentre WVDK, is to bring together the most skilled players and thereby develop solutions for the water industry. The goal of the epicentre is to release the potential of the Danish water industry to become world leaders and double the export from 20 to 40 billion Danish kroner by 2030.

AVK has played an active part in the making of WVDK and has a seat on the steering committee. Water Valley Denmark has received 57 million Danish kroner as part of the REACT-EU programme to develop equipment and techniques. In AVK, we see great potential in developing our Smart Water.

REACT-EU is recovery aid to areas in Europe. The aid is an extension of the crisis response and crisis management measures that were introduced as a reaction to covid-19.

Source: [European Commission](#)

Danish Water Forum

Danish Water Forum works to promote Danish and international research, development, and innovation within the water industry. Their goal is to strengthen the Danish water agenda by contributing to Danish knowledge and skills in international water organisations and initiatives within the water industry.

Danish Water Forum plays an active part in relation to a green strategic co-operation agreement between India and Denmark, along with DI Water and the Danish embassy in Delhi, as they have brought together the players in

the water industry in the two countries. The contribution of DWF is to arrange workshops and conferences in India with Danish water technology at the centre.

Green strategic partnership between India and Denmark

In September 2020 Narendra Modi, the Prime Minister of India, and Mette Frederiksen, the Prime Minister of Denmark, signed an agreement through which Denmark and India entered a strategic partnership.

On 3 May 2022 prime minister Narendra Modi visited Denmark and met with representatives of leading Danish companies within the green transition, including AVK's CEO and owner, Niels Aage Kjær. At the meeting, Niels Aage Kjær and Larsen & Toubro (L&T), an Indian multinational engaged in engineering, procurement, and construction (EPC), signed a memorandum of understanding (MOU). The purpose of the agreement is to strengthen the partnership for projects and opportunities within water and wastewater projects and so create a reliable water supply to the people in India.

Since then, the Danish embassy, Dansk Industri (Confederation of Danish Industry), and Danish Water Forum have arranged delegation meetings to both India and Denmark, where AVK has participated with, among other things, a presentation of the LEAKman project.

Since 2016, the Municipality of Aarhus and nearby companies, including AVK, have co-operated with the Indian city Udaipur to ensure clean drinking water, wastewater handling and a holistic planning and handling of water in urban development. They are hoping that the lessons learned during this co-operation will spread to the entire region of Rajasthan where Udaipur lies, a region of 56 billion inhabitants. The urbanisation in India has speeded up which puts a strain on the cities and not least on the resources of the country, including the water supply.

"Denmark has the skills, India has the scale."

Indian prime minister, Narendra Modi.

Source: [Confederation of Danish Industry](#)

India has approximately 1.3 billion inhabitants.

It is estimated that by 2030, India will assume China's position as the most populated country in the world.

Around 627 million people in India have no access to clean water.

Source: [Confederation of Danish Industry](#)

WTA (Water Technology Alliance)

The Water Technology Alliance offers knowledge sharing between the North American and the Danish water industries to promote exchange of views and experience within the area of water and wastewater. This is a co-operation between Californian supply companies and authorities and Danish players, supply facilities and companies on the market, including AVK. The co-operation originates in an agreement between the Californian state government and the Danish government which was signed in 2016.

Both AVK Holding and American AVK are actively involved in this co-operation as we in Denmark receive delegations on so-called fact-finding travels where we contribute with knowledge about our role in relation to the Danish water supply or wastewater handling. These inputs are subsequently transferred to American conditions, and here American AVK plays the major role. This co-operation has lifted the AVK brand significantly on the American market.

OUR FUTURE ACTIVITIES AND AREAS OF ACTION

The AVK Group designs, manufactures, and markets innovative quality products, many of which are part of recycling initiatives and processes or energy, water, and infrastructure solutions. At the same time our foundation is to act responsibly towards both employees, the environment, and the society around us.



Implementing environmental and climate strategy

In the coming year, we will direct our attention toward establishing a future method for calculating CO₂ and for carrying out the environmental and climate strategy. We will implement activities and processes to ensure this. This also means that energy improvement projects will continue; we will initiate implementation of the energy management system ISO 50001 in our production companies and increase the level of green energy sources. Additionally, we will work on life cycle analyses and subsequently apply minimal energy consumption as the core criterion of the design and production process.

We continue our work on identifying methods to recycle and reuse materials at our factories and involve ourselves in partnerships to ensure that we can purchase sufficient recycling material for the production.

Another very important parameter is the fact that we want to apply low energy consumption as a preference in relation to investments and targets investments into energy savings, including installation of solar panels.

Supplier management

Further implementation of the Code of Conduct activities remains a target in the way we manage our supplier portfolio in new countries and areas. We have added resources to the Danish and global quality and sustainability functions and in the coming years, this will allow us to strengthen our efforts in relation to responsible supplier selection and our approach to Code of Conduct.

Continuous product related innovation

AVK operates within several business areas that undergo an exciting development. We maintain our constant attention to innovation and development of new and improved high-quality solutions with a long lifespan and recycling, both through our own development facilities and through partnerships.

Innovation and sustainability are two of our fundamental values and we want to invest in innovative technologies and new business areas that contribute to the green transition.

Social responsibility

AVK wants to remain a socially responsible company that supports our local community as well as national and international charity.

We will continue our work on implementing our Data Ethical Policy. We are also aware of our responsibility for making our company more attractive to women and among other things we wish to increase the share of women in management through various initiatives.

It remains an area of high priority to ensure as few working accidents as possible, to be a professionally challenging workplace where all our employees continue to develop through education and training and where they can maintain their commitment and well-being.

AVK wants to remain a robust Group of companies that ensures a functional workplace that measures up to our obligations to our customers and other stakeholders.





APPENDIX



Overview of AVK's ISO certifications

AVK has worked with ISO since 1990 when we achieved our first ISO 9001 certification, and since then, the ISO documentation has been integrated into our QEMS (Quality and Environmental Management Systems). Our management system includes the ISOs mentioned in the following sections, except for ISO 50001 which will be implemented in the coming years. In the key figures overview in this appendix, it can be seen how many of our production companies that holds the individual certifications. Based on the description by [Dansk Standard](#) (Danish Standard) of each certification, we give this overview.

ISO 9001

ISO 9001 is a quality management system. It is a tool to ensure a solid foundation for quality management in a company, with a constant attention to improve to maintain competitiveness.

ISO 29001

ISO 29001 is an industry specific quality standard developed for the energy industry, including particularly the kerosene, petrochemical, and gas industry. Generally, the foundation of this standard is based on the ISO 9001 principles. In ISO 29001, however, there is an increased focus on: Control mechanisms, employee qualifications (and supplier requirements), traceability, and documentation. Wrong handling of explosives and gasses can lead to grave consequences for both people and the environment. For this reason, AVK has chosen this ISO superstructure (of additional requirements) in our supply chain to the oil and gas industry to be able to demonstrate a high-quality level and correct management of the company's processes.

ISO 14001

ISO 14001 is a management tool within environmental management which acts as the framework for the environmental performance. Environmental management according to ISO 14001 enables us to risk assess environmental matters, to focus on the most significant environmental matters, ensure reduction of the environmental impact and to improve environmentally on an ongoing basis.

ISO 45001

ISO 45001 is an international standard within occupational health and safety systems. The purpose of ISO 45001 is to improve the working environment by creating the right framework for management and control of the risks associated with health and safety. It is a management system to reduce accidents in the workplace and to achieve safe and healthy places of work. The efforts on health and safety are put into a system, controlled, evaluated, and improved.

ISO 50001

ISO 50001 is an international standard of energy management. The purpose of ISO 50001 is to create systems and processes that improve and reduce the resource and energy consumption. The tool enables the establishment of an energy policy and a systematic approach to energy goals at all levels.

APPENDIX

Table 1: ESG key figures, result

Environmental data	Unit	2020/21	2021/22	Change	Description (2021/22)
CO ₂ e, Scope 1	tonnes	7,601	9,756	28.35%	Direct emissions from burning of e.g. natural gas, oil and petrol. Internal transportation is included from 2021/22.
	tonnes CO ₂ per DKK million (turnover)	1.18	1.29	9.32%	Total consumption for all companies.
CO ₂ e, Scope 2 ¹	tonnes	11,094	9,041	-18.50%	Indirect emissions from purchase of energy, e.g. electricity and district heating.
	tonnes CO ₂ per DKK million (turnover)	1.73	1.19	-31.21%	Total consumption for all companies.
Energy consumption from electricity	MWh	96,896	101,322	4.57%	Total consumption for all companies.
	MWh per DKK million (turnover)	15.1	13.36	-11.52%	Of these, 29,717 MWh (29.3%) come from renewable energy sources.
Heat consumption (district heating)	MWh	1,216	1,040	-14.45%	Total consumption for all companies.
	MWh per DKK million (turnover)	0.19	0.14	-26.32%	
Heat consumption (natural gas)	m ³	3,374,650	3,999,298	18.51%	Total consumption for all companies. Of these, 223,727 m ³ (5.9%) derive from biogas.
	m ³ per DKK million (turnover)	525.89	527.33	0.27%	
Water consumption	m ³	154,671	173,241	12.01%	Total consumption for all companies.
	m ³ per DKK million (turnover)	24.1	22.84	-5.23%	
ISO 14001 certifications	Number	31	34	9.68%	AVK consists of 106 production and sales companies.
ISO 9001 certifications	Number	51	56	9.80%	AVK consists of 106 production and sales companies.
ISO 29001 certifications (gas)	Number	10	11	10.00%	Valid for all AVK companies that design, manufacture and supply products for gas.

¹ Comments to CO₂ calculations

To calculate CO₂ according to Scope 1 and 2 we apply the climate compass as published by the Danish Business Authority (Erhvervsstyrelsen). The climate compass provides indicative data and is based on the recognised Greenhouse Gas Protocol (GHG protocol). During the financial year 2022/23, we expect to be able to make more exact international calculations of the emission factors of the individual countries.

APPENDIX

Table 1: ESG key figures, result

Social data	Unit	2020/21	2021/22	Change	Description (2021/22)
Number of employees	Number	4,575	4,886	6.80%	The average number of full-time employees in the AVK Group as per 30 September 2022.
Number of work-related accidents resulting in absence	LTA	40	49	22.50%	LTA = Lost Time Accident = number of accidents with >1 day's absence. All AVK companies.
Number of accidents per 1 million working hours	LTIFR	4.60	5.28	14.78%	1900 working hours are used as an average (ref. OECD). LTIFR stands for Lost Time Injury Frequency Rate = the number of accidents per 1 million working hours. All AVK companies.
ISO 45001 certifications	Number	20	27	35.00%	AVK consists of 106 production and sales companies.
Supplier management and audits	Number	20	24	20.00%	Code of Conduct applies to all suppliers, but we audit based on a risk assessment in risk areas.

Management data	Unit	2020/21	2021/22	Change	Description (2021/22)
The gender diversity of the Board of Directors	%	20	20	0%	One woman on the board, of a total of five members (not counting in two employee representatives), as per 30 September 2022.

APPENDIX

Table 2: ESG-key figures, objectives for the financial year 2022/23

Environmental data	Unit	Result 2021/22	Objective 2022/2023	Description
Energy consumption from electricity	MWh	101,322	2% ↓	Improvement initiatives: Machinery, LED-lights, and sensor to improve efficiency. Increase share of power from renewable energy sources to +35%.
Heat consumption (district heating)	MWh	1,040	1% ↓	Local improvement initiatives such as: insulation of buildings, better room temperature control (sensors) and reused heating from equipment.
Heat consumption (natural gas)	m³	3,999,298	1% ↓	Local improvement initiatives such as: Improve gas furnace, heat control and reused heating from equipment.
Water consumption	m³	173,241	2% ↓	Local improvement initiatives such as recycling of water at test stations and water-economical lavatories.
Waste for reuse/recycling		62%	>80%	Monitor local waste fractions and thus increase recyclability.
ISO 14001 certifications	Number	34	36	One additional AVK company in the process of achieving its ISO 14001 certification. AVK consists of 106 production and sales companies.
ISO 9001 certifications	Number	56	56	AVK consists of 106 production and sales companies.
ISO 29001 certifications (gas)	Number	11	11	Valid for all AVK companies that design, manufacture and supply gas products.

APPENDIX

Table 2: ESG-key figures, objectives for the financial year 2022/23

Social data	Unit	Result 2021/22	Objective 2022/2023	Description
Number of employees	Number	4,886	--	The average number of full-time employees in the AVK Group as per 30 September 2022.
Number of work-related accidents resulting in absence	LTA	49	<35	LTA = Lost Time Accident = number of accidents with >1 day's absence. All AVK companies.
Number of accidents per 1 million working hours	LTIFR	5.28	<4,0	1900 working hours are used as an average (ref. OECD). LTIFR stands for Lost Time Injury Frequency Rate = the number of accidents per 1 million working hours. All AVK companies.
ISO 45001 certifications	Number	27	29	Two additional AVK companies in the process of achieving their ISO 45001 certification. AVK consists of 106 production and sales companies.
Supplier management and audits	Number	24	>50	Code of Conduct applies to all suppliers, but we audit based on a risk assessment in risk areas. We will expand our activities to other countries such as India.

Management data	Unit	Result 2021/22	Objective 2022/2023	Description
The gender diversity of the Board of Directors	%	20	20	One woman on the board, of a total of five members (not counting in two employee representatives), as per 30 September 2022.

