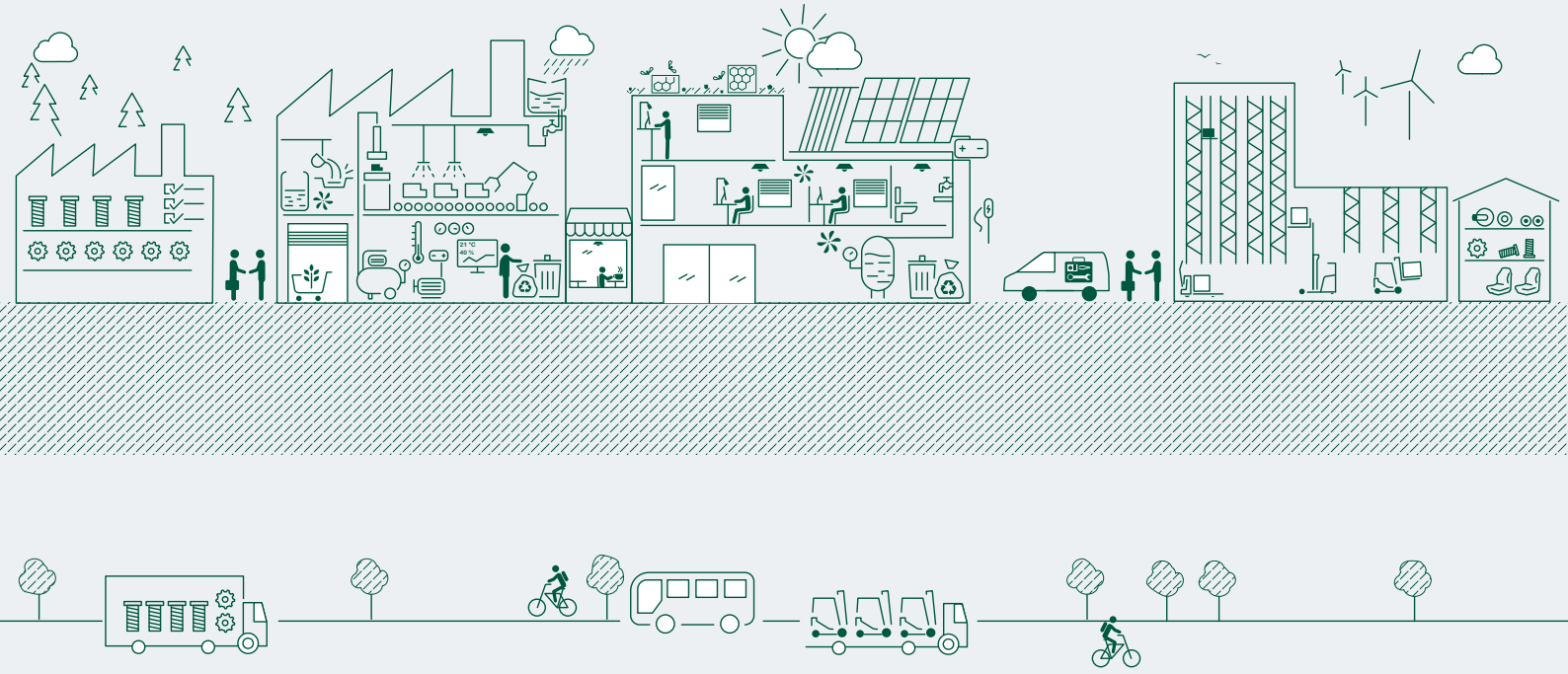
The Green Guide

Measures to increase environmental sustainability along the entire value chain



JUNGHEINRICH

“Climate action is not optional. It is essential for economic stability and prosperity. […] The clean energy transition is unstoppable – and it is creating jobs, lowering energy bills and cleaning our air. […] We have the tools, the technologies and the finance to act – what we need is implementation.”

António Guterres, UN Secretary-General.

The "Why" behind this guide

The effects of climate change are becoming increasingly tangible – including for businesses. In practical terms, this means that customers are increasingly demanding climate-neutral solutions and investors are regarding ESG criteria as business-critical. Furthermore, regulatory pressures – from the EU Taxonomy to the CSRD – are steadily increasing. At the same time, competition is intensifying for those clients who have made sustainability an integral part of their supplier selection process.

At Jungheinrich, we do not view this development as a challenge, but as an opportunity: we are pursuing the long-term vision of "climate neutrality" – a state in which human activities have no net effect on the climate system. In doing so, we are responding to market demands whilst also acting as a reliable partner for our customers' transformation.

To fight climate change and reach the 1.5°C goal of the Paris agreement of the UN Climate Council, Jungheinrich as a company has committed to reducing its GHG emissions across all three scopes by 30 per cent, compared with the 2021 baseline, by 2030, or to neutralising them through appropriate measures. In doing so, we recognise that climate protection encompasses more than just CO_2e reduction: factors such as biodiversity loss, resource consumption and water pollution also play a key role in a holistic sustainability strategy.

Our overall commitment spans the entire value chain and encompasses all our locations. And we recognise that achieving this ambitious goal requires the active participation and engagement of more than one company.

Hence, we make every effort to bring you with us on this journey, as our partners. Hence, to support you, we've created this guide of practical measures. It can serve as one of the fundamental building blocks on the road towards a net zero future and we hope to inspire you, and contribute to your knowledge, as well as providing the tools needed to implement sustainable change throughout your organisation.

Together we can make a difference!

Your Sustainability Team

Contents

Procurement

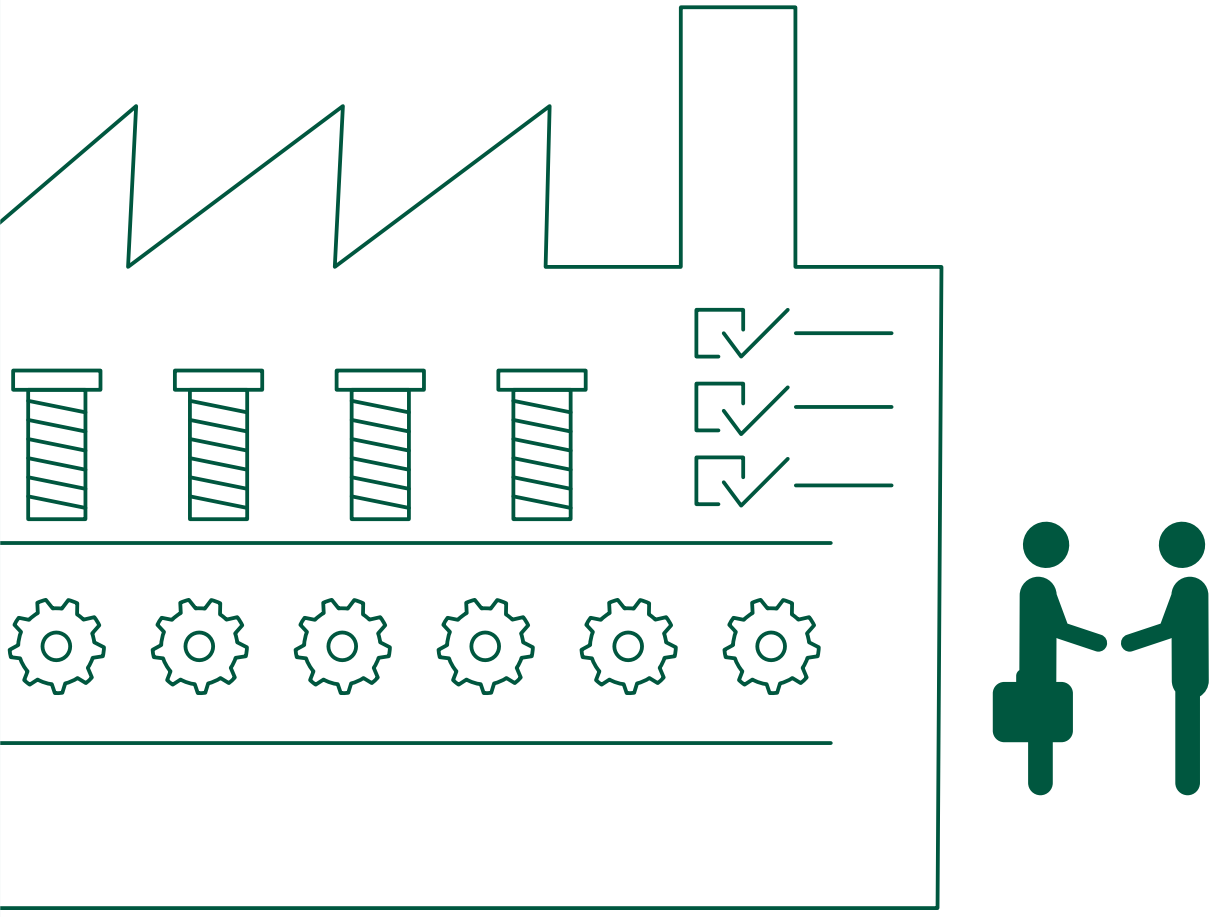
Purchase goods made from recycled materials to eliminate the emissions that would result from the production of new materials.

Before obtaining spare parts, check whether the equipment can be repaired. This not only cuts costs and time for procurement but also eliminates the emissions generated during the production and transportation of new replacement parts.

Ask for climate-friendly alternatives during the procurement process to select and purchase the variant with the lowest emissions. This could include different materials or a more environmentally friendly production process, for example.

Place bulk orders whenever possible to reduce the number of journeys. This cuts both costs and the emissions that would be generated by each individual delivery.

Promote the shared use of office furniture to reduce the amount that needs to be procured. This cuts costs and eliminates the emissions that would be incurred for each individual piece of furniture.



Renewable Energy

Install systems to generate energy on-site and for self-consumption, e.g. in the form of on-site solar systems.

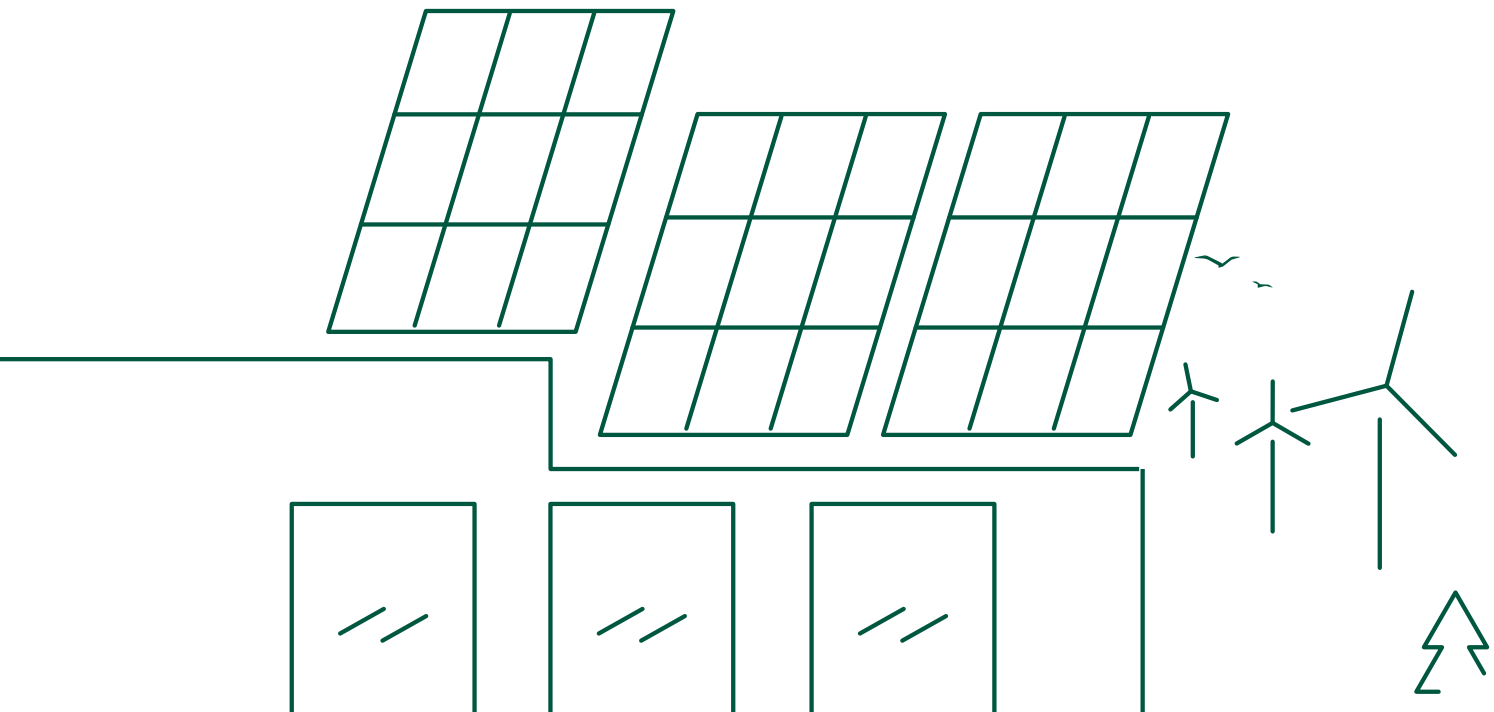
Establish a Power Purchasing Agreement (PPA) to purchase renewable electricity at a pre-agreed price for a pre-agreed time directly from a renewable power producer.

Choose a renewable ("green") tariff. This is an electricity tariff or price structure offered by an electricity supplier that enables a Jungheinrich entity to access renewable energy, generated by a third party, in a specific service territory.

Purchase Energy Attribute Certificates (EACs), also called Renewable Energy Certificates (RECs). They can act as a substitute for the "real" supply of renewable energy if the three previously mentioned options are not available to you.

Make a Virtual Power Purchasing Agreement (VPPA) to (only) virtually purchase renewable electricity at a pre-agreed price for a pre-agreed time if the other options are not available to you.

Use demand side management methods as they reduce costs and can help stabilise the energy market in times of over- or under-production by renewable energy providers.



Insulation

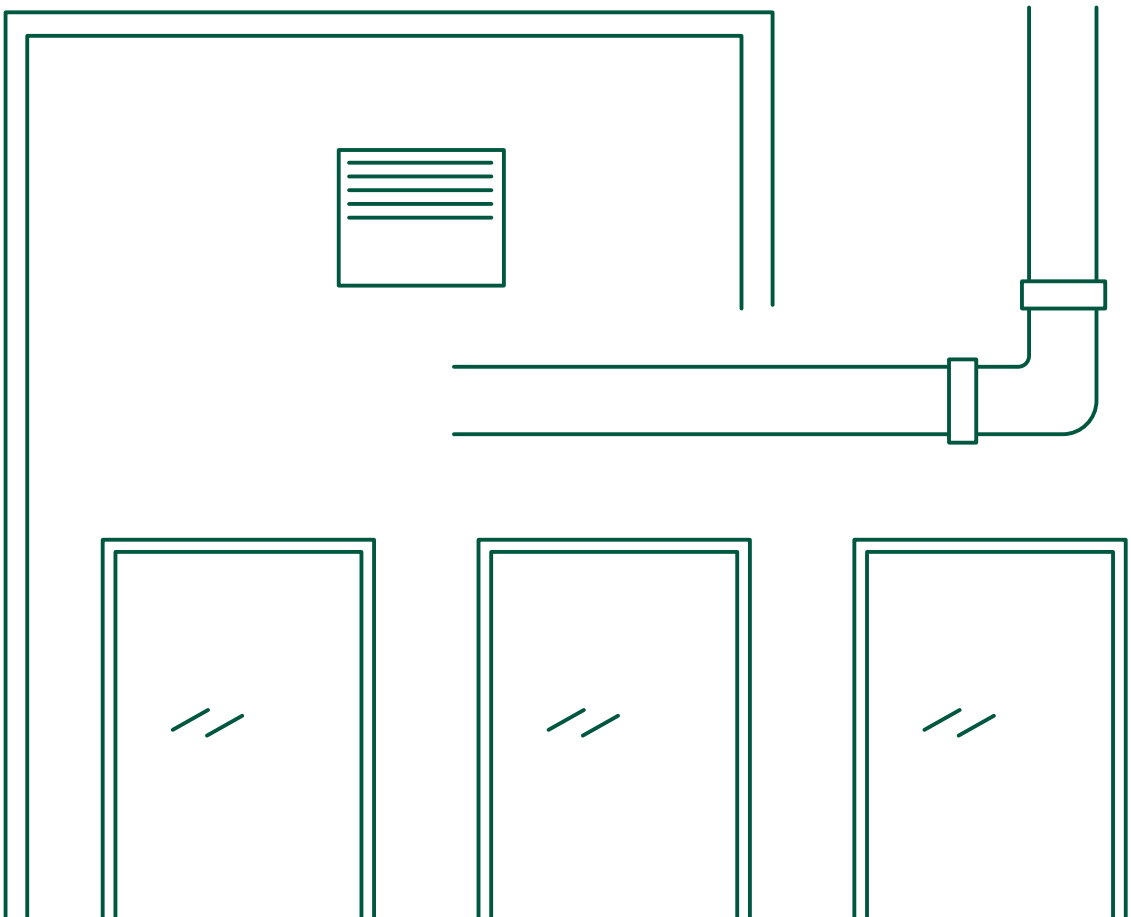
Insulate the outside of buildings. This is an effective method to avoid heat loss. Increasing insulation thickness from 100 to 500 mm can reduce a building's lifetime emissions by 25 to 38%.

Make sure to use proper insulation for thermo-conductive pipes and equipment. This can reduce heat and energy losses by up to 90% as well as improving energy efficiency, reducing the need for heating and cooling.

Exchange single-glazed windows for fibreglass, high-performance R-5 windows or ones with a high solar heat gain coefficient. This will lead to a reduction in heat loss and keep the building at a more comfortable temperature with less energy required.

Insulate windows with a window insulation film that acts as a barrier between the air outside and in-side. This helps to keep warmth inside the building as well as to reduce energy consumption and heating costs.

Add carpets in office spaces as they can work as heat buffers.



Lighting

Make the most of daylight with daylight harvesting. Use the daylight available to reduce the need for artificial lighting, lowering energy consumption.

Install motion sensors that work by detecting changes in their environment and triggering a response, like turning lights on/off. This helps to reduce energy consumption by avoiding the unnecessary use of electricity.

Choose LED lighting, which is a superior option to older lighting such as fluorescent tubes as it uses less energy, emits light in a specific direction, has a longer lifespan, and maintains brightness and intensity.

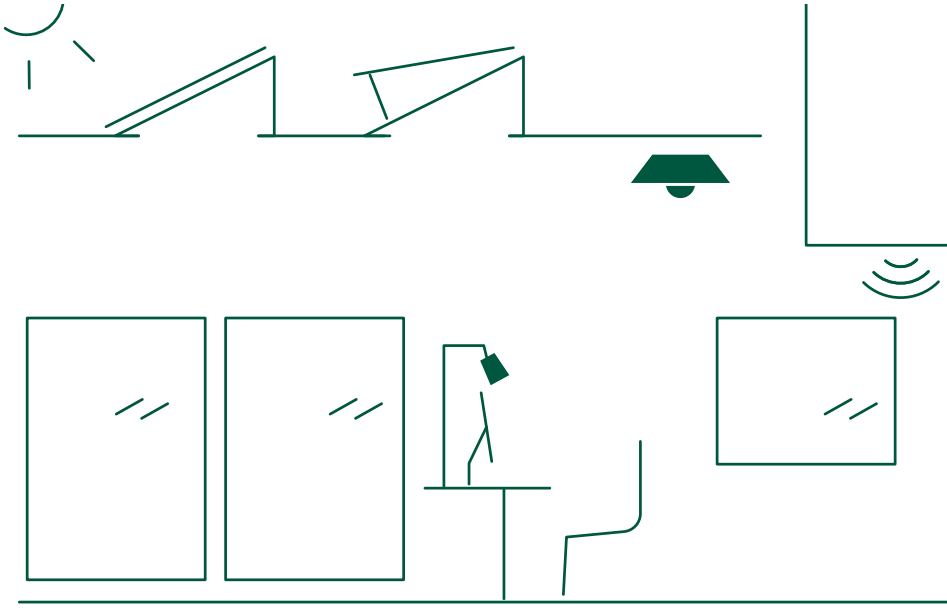
Use light sources with energy efficiency class A or B, which are considered the most energy-efficient lighting choices according to the European Union energy label.

Provide task lighting that focuses on illuminating the work area directly in front of the user, while simultaneously minimising light levels in non-task areas to conserve energy.

Configure outdoor lighting on-site so that it is not on all night long, only in the morning and evening when it is necessary for people's safety. This reduces costs and electricity consumption. If possible, shut down the power supply outside business hours. Moreover, use lighting that faces downwards to the ground and choose a warm or even a red light to attract fewer insects.

Utilise automatically dimming lights. They em-ploy different techniques, such as dimmer switches, electronic dimmers, in-built cameras and sensors, to automatically adapt brightness based on user preferences and/or environmental conditions, such as the availability of daylight, to save energy and reduce electricity costs.

Employ solar shading elements (e.g. shading devices, exterior shading systems) in facades and roofs to effectively reduce energy consumption by blocking solar radiation and minimising heat entry.



Water

Reduce water pressure to help save water and reduce energy usage. High water pressure can also cause leaks, waste water and increase energy usage for pumping and treating water.

Use rainwater harvesting systems in office buildings to collect and store rainwater for various uses after filtration, promoting the conservation of fresh water and lowering expenses for fresh water.

Save water through motion-activated fixtures, especially in areas where there is a risk of constant water flow. These fixtures can help reduce water usage and costs by turning off automatically when not in use.

Install low-flow toilets and taps or fit tap aerators. All of these use significantly less water without compromising performance, thus helping to save water. Also consider the concept of dry toilets (e.g. composting toilets).

Install rainwater harvesting tanks to reuse rainwater for landscape irrigation and toilet flushing.

Measure water consumption to get a deeper understanding of water usage and explore potential for reduction.

PROCESS WATER

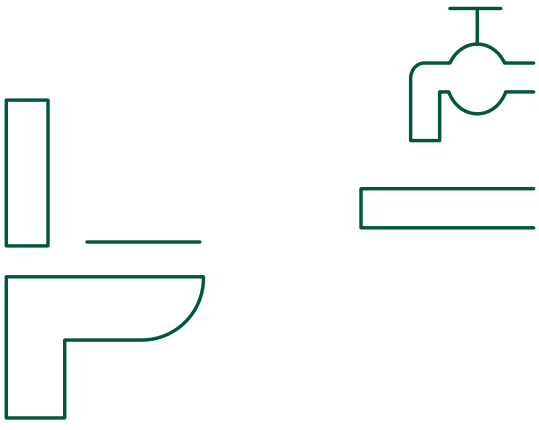
Introduce water reuse and recycling systems to treat and repurpose wastewater generated in office buildings and during production, maintenance, refurbishment and/or remanufacturing processes. This promotes water efficiency and sustainable water management practices.

Implement water-efficient process designs, such as closed-loop systems, to minimise water losses and enhance water reuse within production, maintenance, refurbishment and/or remanufacturing processes.

Consider water flow when purchasing water-consuming equipment and install watersaving valves and sensors to minimise water consumption in processes.

Minimise water pollution by monitoring and minimising the use of water-polluting substances and replacing chemical substances with less toxic, biodegradable ones.

Use rainwater for vehicle painting. This saves fresh water.



Hot Water and Steam

HOT WATER

Use solar thermal power for buildings, which utilises solar energy to provide heating and hot water, to reduce the reliance on traditional heating systems powered by fossil fuels. This not only helps to lower energy consumption but also generates cost savings.

Choose tankless water heaters for hot water generation in the office. They are a more sustainable option because they boast higher energy efficiency than traditional tank water heaters by only heating water when it is needed.

Make sure that condensate is returned to the boiler (minimum 80%). This is crucial as it enables energy conservation by reusing heat energy, reduces water consumption by utilising the condensate as boiler feedwater, and mitigates greenhouse gas emissions by reducing the energy required for steam production.

STEAM

Optimise the pressure in steam systems by setting the pressure to the lowest feasible level and adjusting it for summer and winter operating conditions. In doing so, you can increase efficiency, safety and energy savings by reducing energy consumption and improving overall system efficiency.

Heating, Ventilation, Air Conditioning (HVAC), Cooling

HVAC IN GENERAL

Use heat exchangers, which facilitate the transfer of thermal energy from one medium to another, as an effective method to recover energy from waste heat and to improve overall efficiency.

Consider energy recovery wheels (or enthalpy wheels). These are HVAC system components that efficiently transfer heat and moisture between outgoing and incoming air streams, offering a sustainable solution to reduce energy consumption and greenhouse gas emissions.

Implement an automatic tube cleaning system for shell and tube heat exchangers, chiller condenser tubes and water pipes. This utilises circulating sponge balls or brushes and continuously cleans them at programmed intervals, thereby improving efficiency, reducing energy consumption and maintaining system capacity by preventing dirt and scale deposits from accumulating.

Install high-speed doors to separate areas with different temperature levels. This lessens temperature surges and reduces the consumption of energy needed to maintain the temperature in an area.

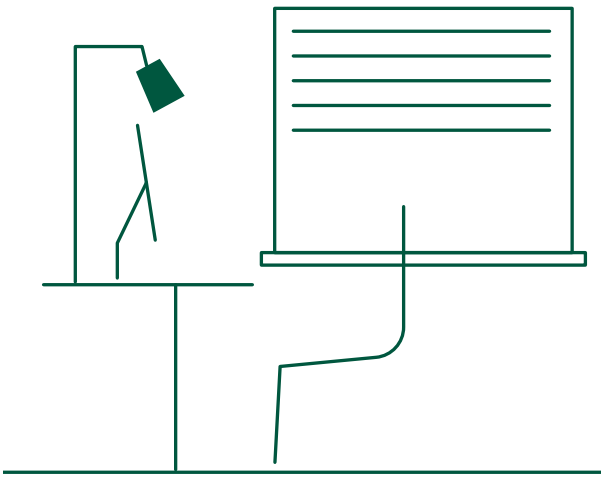
HEATING

Use natural heating sources such as sunlight or solar thermal energy to reduce dependence on artificial heating sources and save energy.

Choose CO_2e-efficient heating systems such as air- or ground-source heat pumps, ideally powered by renewable electricity. Depending on the location, district heating may also be an option.

Utilise the waste heat generated by compressors and reduce the need for other types of heating.

Install radiator thermostats with a network interface to enable the continuous monitoring of heat consumption and centralised (remote) control.



VENTILATION

Prioritise natural ventilation as this helps to save energy and reduce costs. However, make sure that, if natural ventilation is used, air conditioners are turned off, so as not to waste any energy.

Use effective air filtration systems to remove contaminants, pollutants and airborne particles from ventilation air. Choose filters with appropriate efficiency levels (e.g. Minimum Efficiency Reporting Value (MERV), High Efficiency Particulate Air (HEPA), energy rating and dust spot efficiency)) based on the specific requirements of the building or plant and the nature of the contaminants present.

AIR CONDITIONING

Choose cool roofs as a replacement for conventional ones. They work by reflecting more sunlight, absorbing less solar energy, having a high thermal emittance value as well as using heatresistant and lightcoloured materials. Cool roofs can benefit a building and its occupants by decreasing the roof temperature, which in turn reduces the room temperature, improving occupant comfort, reducing energy consumption and costs, and also reducing urban heat island effects. If possible, the implementation of green roofs can increase efficiency further, as they don't just reduce roof temperatures in warm periods but can also reduce the need for heating in cold seasons while serving local biodiversity as well.

Install shading devices such as blinds, curtains or awnings to help reduce heat gain and improve energy efficiency. Using reflective paint on the outside of buildings can also increase reflection and keep the building colder when it is exposed to direct sunlight.

Choose air-conditioning systems that have a high SEER rating and use either solid (e.g. barocaloric materials or metal halide perovskites) or natural refrigerants (e.g. carbon dioxide, propane, propylene, etc.) as they reduce energy consumption and do not have a significant negative effect on the ozone layer.

Insulate windows, e.g. with a special film that acts as a barrier between the inside and outside temperature. This helps to keep heat outside the building and reduce energy consumption and the costs of air conditioning rooms.

Install solar shading elements on walls and roofs (e.g. shading devices, external shading systems) to effectively reduce energy consumption by blocking solar radiation and minimising heat gain.

COOLING

Install variable speed drives (VSDs) on cold-water pumps. They can modulate motor speed in applications such as pumps, tower cooling fans, air handler fans and chillers, enabling efficient operation and reducing energy consumption.

Maintenance, Monitoring and Control Systems

GENERAL

Let building automation and control systems (BMSs) support you. These computerised systems monitor and control a building's mechanical and electrical systems. They can be monitored via a building automation system or management system and serve, among other things, to ensure efficient operation, reduce operating costs and remotely control access.

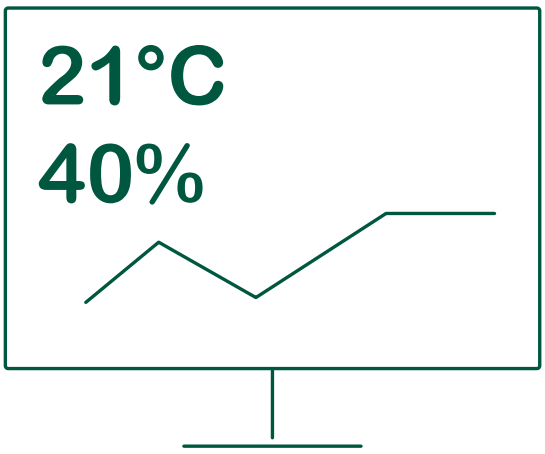
Optimise energy use by installing energy management systems (EMSs). These computer-based systems measure and optimise energy use by controlling diverse devices such as HVAC units and lighting systems. They aim to increase efficiency, lower energy consumption and save money by identifying areas of waste and inefficiency. EMSs differ from building management systems (BMSs), which primarily focus on building operations.

Establish a maintenance routine to help extend the life of all equipment and to ensure that it operates optimally.

LIGHTING

Deploy smart lighting control, which involves the use of devices and systems to regulate lighting, encompassing automated and standalone control elements like occupancy sensors, time clocks, photocells, etc., which enable the maximisation of energy savings.

Apply solar control elements (e.g. solar control glazing, automated shading systems and dynamic glazing) in facades and roofs to effectively reduce energy consumption by blocking solar radiation and minimising heat entry.



HOT WATER

Utilise automated continuous blowdown control for boilers that are used for hot water. This is necessary to reduce the concentration of dissolved solids, which negatively affect the boiler and damage piping. Automated continuous blowdown control adjusts water discharge based on the concentration of dis-solved solids, improves boiler efficiency, reduces water usage and decreases energy consumption.

STEAM

Inspect the steam trap using various methods such as visual observation, temperature measurement, sound/vibration measurement or ultrasound.

Review the condenser selection, sizing and installation regularly to ensure proper operation, prevent safety and efficiency problems from steam leaks and condensate buildup, and repair faulty traps.

HVAC

HVAC IN GENERAL

Lower the room and hall temperature at night and at weekends. This controlled adjustment of HVAC settings outside working hours is an effective strategy for saving energy and reducing operating costs.

Turn off the air conditioner in unused rooms to reduce electricity and refrigerant consumption.

Install a centralised control system for HVAC equipment that regulates temperature, humidity and air quality across different zones, improving operational efficiency, reducing energy consumption and enhancing indoor air quality. In addition, zoning and controls can be implemented to effectively regulate heating in different areas of the workplace, resulting in reduced energy consumption and emissions.

Use demand-controlled ventilation (DCV). This is an energy-saving method that automatically adjusts ventilation rates based on changes in occupancy or indoor pollutant levels, utilising CO_2 sensors to measure CO_2 concentration and reducing energy consumption, greenhouse gas emissions and the frequency of heating or cooling system operation by introducing fresh air as needed.

Monitor the daily water system logs to maintain a healthy and efficient HVAC system. Regular monitoring can help identify leaks early, detect unexpected usage and help to reduce water costs.

HEATING

Carry out a hydraulic adjustment of the heating system and thereby in-crease its efficiency while reducing gas and oil consumption.

VENTILATION

Monitor CO_2-levels using installed CO_2-monitors for demand-controlled ventilation (DCV). Ventilation rates will be adjusted based on the indoor air quality. This saves energy and reduces greenhouse gas emissions and the frequency of heating or cooling system operation by introducing fresh air as needed.

Use humidistats to monitor and control air humidity levels.

COOLING

Monitor the pressure drop across a chiller, which indicates the difference in pressure between the inlet and outlet. This is crucial for maintaining chiller efficiency, as high pressure drops can lead to reduced heat transfer, increased energy consumption and diminished refrigeration capacity, which is why measurement and monitoring using a pressure gauge is necessary.

Monitor the chiller approach temperature, which represents the temperature difference between the refrigerant and the water in the chiller. This enables you to maintain chiller efficiency, as high approach temperatures can lead to reduced heat transfer, increased energy consumption and diminished refrigeration capacity, making it an important indicator for identifying potential system issues and ensuring optimal chiller performance.

Perform an annual chiller shutdown, including tube cleaning according to manufacturer recommendations, while also checking pumps and cooling towers, monitoring pressure drops, and ensuring a robust monitoring system. This is crucial for maintaining the efficiency, longevity and optimal performance of a chiller system.

Monitor condenser water closely. This involves regularly measuring and analysing the concentration of dissolved solids in the condenser water, comparing it to recommended target values, and making necessary adjustments in water treatment, blowdown rates and makeup water to ensure optimal efficiency and minimise water and energy waste in the cooling system.

COMPRESSED AIR

Detect leaks in compressed air systems, which is crucial for minimising energy waste, lowering maintenance expenses and enhancing system reliability. Ultrasonic detection is the predominant method, supplemented by visual inspection and other techniques.

Control the pressure of compressed air with compressor regulators, which compensate for fluctuations caused by demand, temperature or other factors, thereby safeguarding equipment and preventing damage. They can be strategically placed within the system with additional features for enhanced performance and reliability.

Stabilise system pressure, which is key to improving efficiency and reducing maintenance costs, as it mitigates fluctuations that can cause inefficiencies and equipment damage.

Make use of demand control valves, which play an important role in maintaining a constant pressure throughout the compressed air system, optimising its capacity and performance, and protecting the system from overpressure conditions.

ELECTRICAL EQUIPMENT

Choose energy-efficient office appliances and equipment with ENERGY STAR certification, which can contribute significantly to reducing CO_2e emissions, improving energy efficiency and mitigating green-house gas emissions, resulting in cost savings.

Enable sleep settings on all printers, copiers, fax machines, scanners and multifunction devices to allow them to automatically enter a low-powered sleep mode when inactive.

Get smart meters to save energy and money while allowing utility companies to better manage energy resources. Smart meters are electronic devices that measure and record energy consumption, provide real-time energy data, enable the remote control of appliances and systems, and facilitate the integration of renewable energy sources.

WASTE MANAGEMENT

Carry out a waste audit to categorise and quantify waste. This will allow you to identify areas for improvement and set targets for waste reduction.

WATER

Look out for and fix leaks immediately as this is one of the easiest ways to conserve water in buildings. Leaks can waste a significant amount of water and increase water bills.

PROCESS WATER

Analyse the local water footprint to evaluate water usage throughout the production, maintenance, refurbishment and/or remanufacturing process to help to identify areas of high water consumption or waste.

Canteen

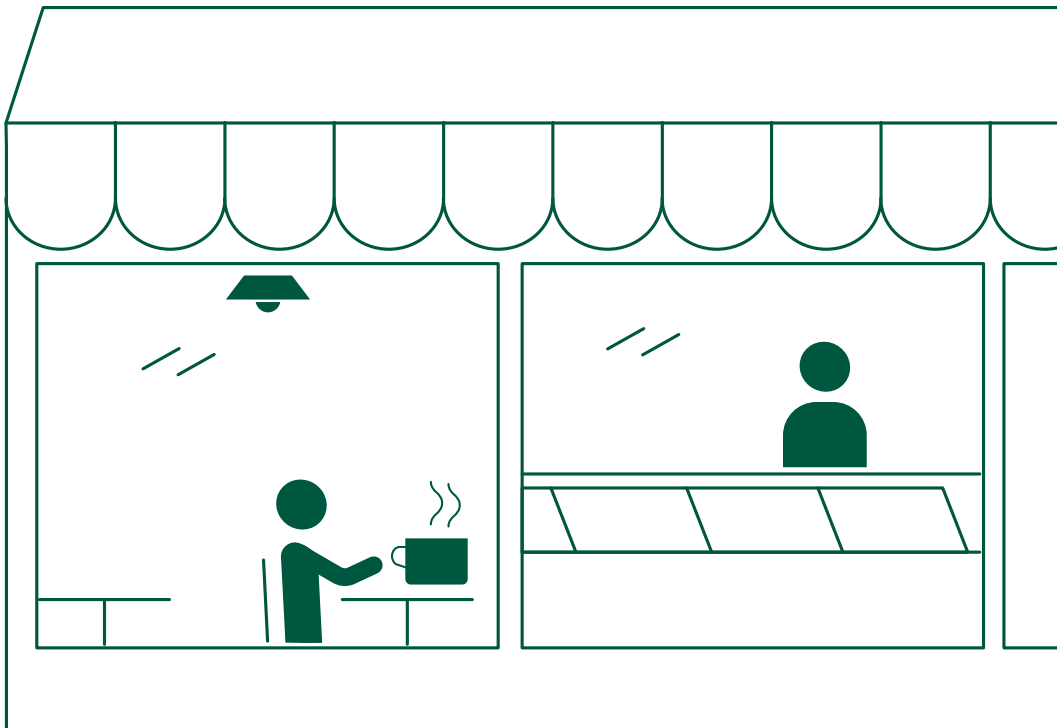
Exclude or reduce meat and fish to help lessen the environmental impact of meals.

Preferably procure products and ingredients that were produced in an environmentally friendly way (seasonal, regional, fair trade and/or organic products) to help reduce the environmental impact, e.g. by transportation, of meals.

Reduce food waste through the op-tion of choosing portion sizes individually.

Establish a composting system to manage organic waste generated in the canteen.

Avoid using coffee machines that are operated with aluminium capsules to prevent environmentally harmful waste.



Biodiversity

Break up sealed surfaces (tar, concrete) that are not in use and convert them into ruderal areas to help enhance biodiversity through improving water infiltration, increasing vegetation and supporting the ecosystem.

Prevent saltwater runoff when de-icing streets. Sand or saw dust or limestone- and clay-based grits are possible replacements for de-icing salt.

Create corridors for animal migration, especially close to roads. Depending on the animal species and size, different measures will be needed. For example, hedges and/or amphibian protection fences are useful for smaller animals.

Install green roofs and living walls to provide a habitat for plants, insects and birds, contributing to increased biodiversity within the building's surroundings, reducing air pollution and having a cooling effect.

Turn unused outdoor space into a low-maintenance garden for wildlife by planting open spaces with long grasses and nectar-rich wildflowers. If a lawn is required, reduce mowing frequency. The use of mulch and ground vegetation also reduces the need for irrigation.

Utilise native plants in the landscaping around buildings, as these are adapted to local conditions and maintain natural vegetation. This can include waterways, ponds, trees and hedges, which can attract native wildlife, including pollinators, birds and beneficial insects, encouraging biodiversity.

Plant wildlife-friendly trees, shrubs and plants to provide important habitat-supporting biodiversity. Make sure to diversify areas, e.g. by planting a miniature forest with many species to create a small but unique ecosystem.

Install water troughs to encourage biodiversity, especially in places where they would not normally be found or during particularly dry periods.

Build or provide nesting sites for insects, birds and bats (e.g. insect hotels, dead wood, bird and bat boxes). Install them in suitable locations and at species-appropriate heights.

Create wildflower meadows and other biodiversity-enhancing measures (e.g. traditional orchards). They offer food and shelter for many insects and birds and can make your site greener and more attractive.

Consider installing honeybee hives on site. They can raise awareness for nature. Assess locally whether they could compete with wild bees for food.

Measures for construction for new buildings and renovation

Construct low-energy/passive-energy buildings to ensure the highest energy efficiency possible.

Align the building's longitudinal sides with the course of the sun to enhance daylight penetration.

In the building process, conduct a lifecycle assessment of existing and planned buildings and take possible impacts for nature into account to understand future risks and dependencies. An assessment of possible locations with respect to water and deforestation, distance to protected areas and the status of nature in general is sensible.

Use sustainable, recycled construction materials according to the waste hierarchy.

Don't use materials with a negative impact during extraction (e.g. tropical wood, natural stone, etc.) or materials from regions with low environmental protection.

Source materials locally to reduce transportation emissions.

When replacing windows or constructing new buildings, select windows that are visible to birds to reduce fatalities and injuries. Existing windows can also be adapted by adding markings.

Choose office locations that prioritise easy access to public transportation and proximity to residential areas, which can minimise commuting distances.

Install air locks at frequently used hall doors to reduce heat loss.

Design and optimise airflow paths and ventilation systems based on the specific process requirements to improve temperature uniformity, reduce energy consumption and enhance overall system effectiveness.

Install Passive Displacement Ventilation (PDV) if suitable. This is an air distribution system that supplies air evenly at floor level, utilising natural convection to circulate air without mechanical fans, resulting in improved indoor air quality, reduced energy consumption and enhanced thermal comfort.

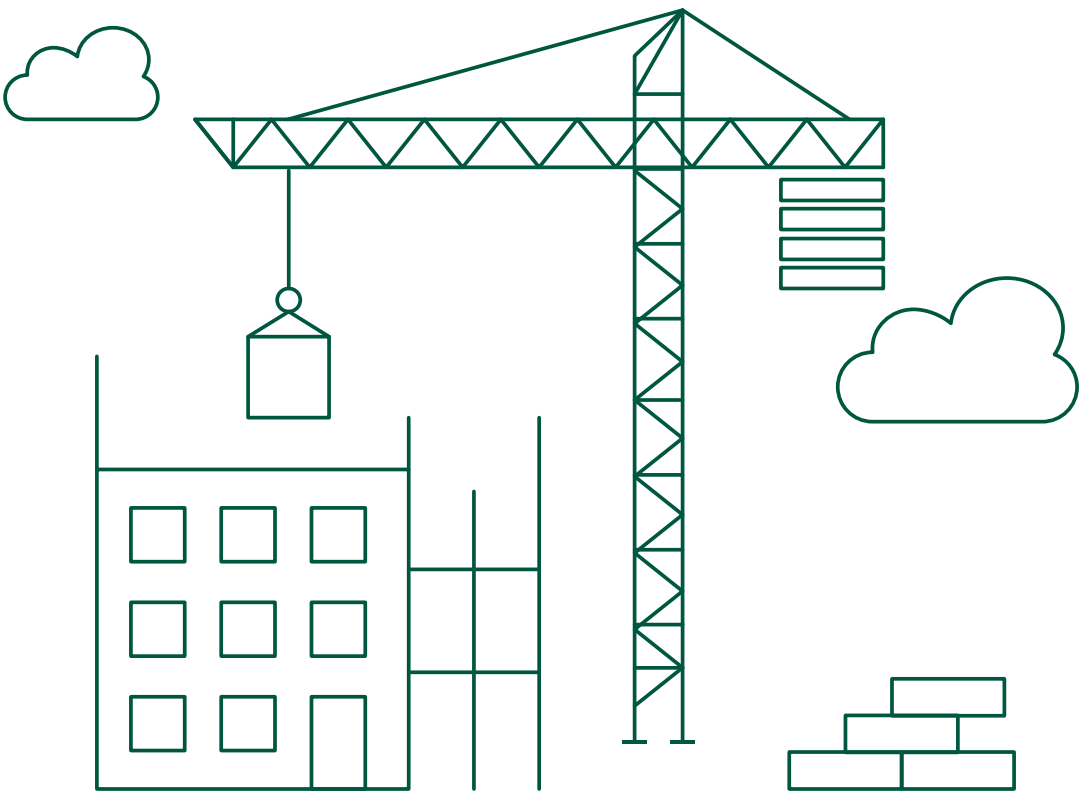
Select the right chiller design to suit different types of building profiles, which involves determining the building load, designing the chiller system, considering the building size and optimising chiller system performance. By carefully selecting the chiller system design, the strengths of different chiller types can be leveraged to optimise chiller performance and reduce energy consumption.

Test buildings for airtightness and thermal integrity if the building area is over 5,000 m².

Use sustainable office equipment, e.g. made from fast-growing natural materials or components that can be easily repaired and recycled at the end of their lifespan in line with the circular economy.

Donate furniture that is not required after office renovations to reduce waste and simultaneously produce social and environmental benefits.

Develop new occupancy concepts, where less free space remains unused, to help consume less land and reduce energy consumption.



Electric motors

Choose energy-efficient motors with better materials, tighter tolerances and improved manufacturing techniques that are compliant with energy-efficient standards, such as NEMA Premium and IEs, to reduce electricity consumption, heat loss and noise while increasing durability.

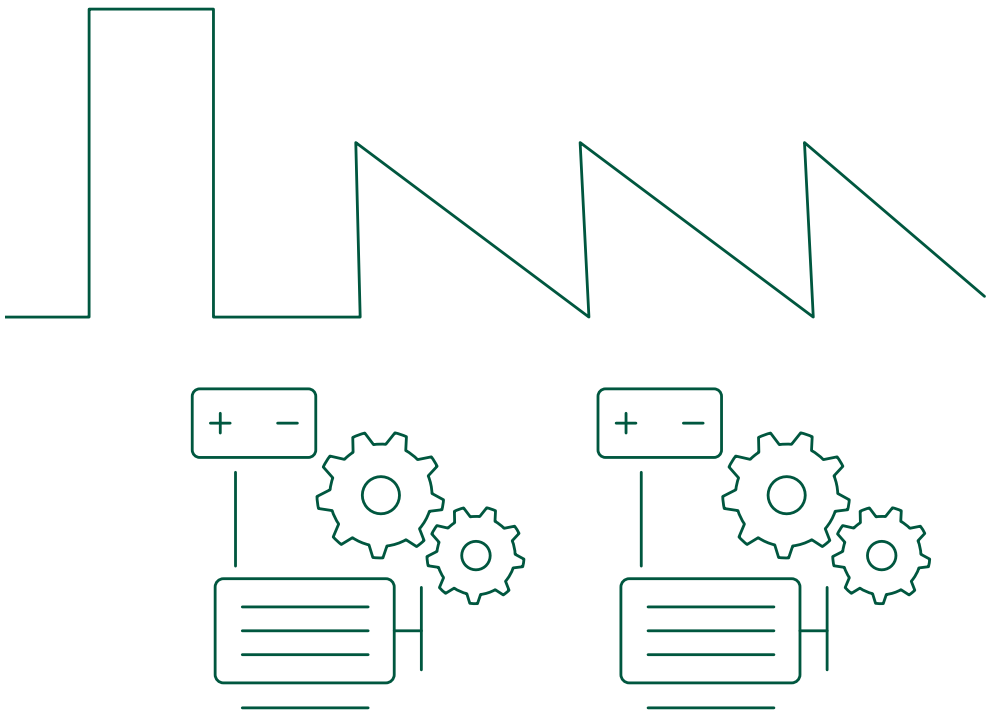
Choose the correct size and design of the motor, as the efficiency of a motor reaches its highest point at approximately 75% of its rated load, indicating that if the motor is either oversized or undersized for the load, it will not operate at optimal efficiency.

Deploy Variable Speed Drives (VSDs) on process loads, which can improve energy efficiency and reduce costs by matching motor speed to the load, resulting in energy savings, improved process control, reduced machine wear and an increased power factor.

Ensure balanced voltage across all three phases of the motor, which may improve its efficiency. This can be achieved by redistributing or reconnecting single-phase loads, installing high-quality protective devices, measuring the voltage between phases, and using high-quality cables.

Use cogged V-belts or synchronous belts, which are two types of belt drives that can be used as alternatives to traditional V-belts, improving the efficiency of power transmission systems.

Regularly conduct steam trap inspections to ensure optimised performance.



Compressed Air

Only employ compressed air for equipment that requires its use, such as pneumatic tools, and not for equipment that can be operated with other methods, e.g. blow guns, air lances or agitation. It is important to assess the tools that require compressed air and check whether it is possible to replace them with more energy-efficient options (e.g. electric devices).

Reduce pressure to the minimum required level as an effective measure to improve efficiency, minimise energy consumption and reduce compressed air costs associated with using excessive pressure.

Use the right size of piping, minimise the number of bends and turns in the piping, and use smooth-bore piping, which can all help improve the delivery of compressed air and improve its efficiency.

Utilise the waste heat generated by compressors and thereby reduce the need for other types of heating.

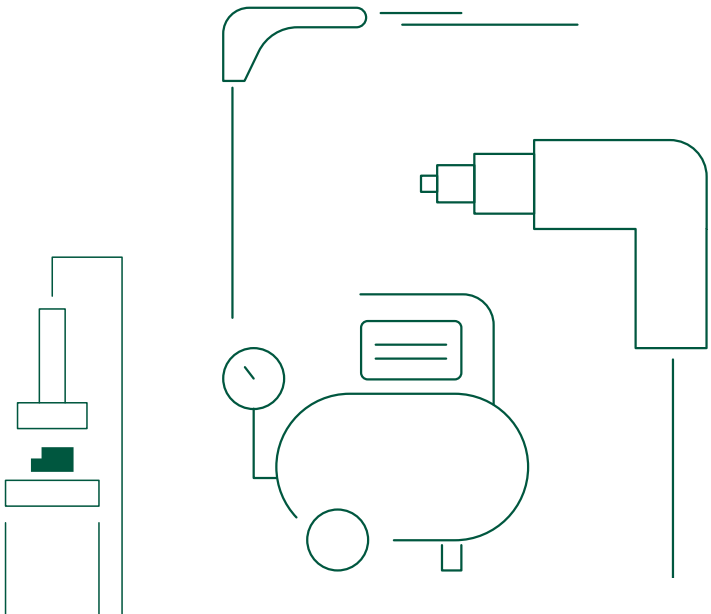
Improve a compressor's efficiency by using cooler intake air. This can be achieved by locating compressors in cool areas, using air intake filters and using air-cooled aftercoolers.

Exchange reciprocating compressors for screw compressors to reduce maintenance requirements and achieve higher efficiency as well as a longer lifespan.

Separate low- and high-pressure air through methods such as fractional distillation, pressure swing adsorption, cryogenic distillation, low-temperature separation and changes in air density or temperature, depending on the application and desired gas purity, which will result in the improved energy efficiency of compressed air systems.

Install a float-type no-loss drain in the compressed air system that allows for condensate discharge without any compressed air loss, improving efficiency and reliability.

Use full-flow ball valves, featuring a rotating ball with a bore to control liquid or gas flow. They offer advantages such as reduced pressure drops, versatility, and ease of operation and repair, making them suitable for applications demanding high flow rates and low pressure drops.



Paintshop and other processes

GENERAL

Increase the energy efficiency of machines/plant equipment and prioritise electrified machines over gas- and oil-powered ones when making new purchases.

WELDING

Use energy- and emission-efficient welding processes and replace MAG welding if possible.

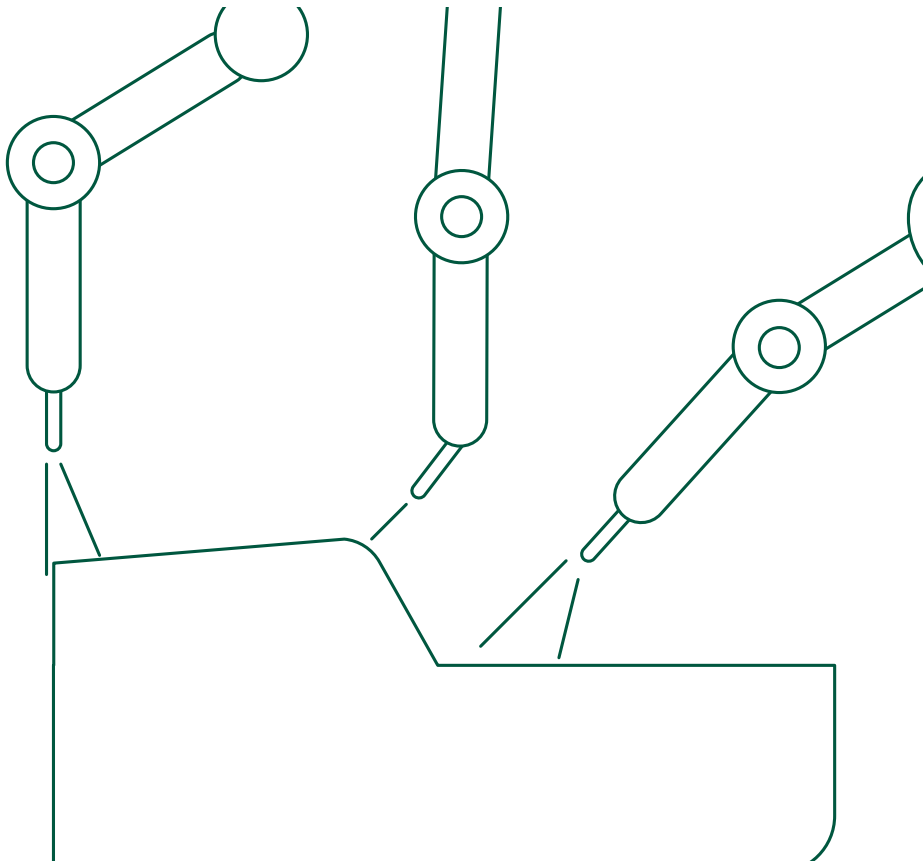
PAINTSHOP

Switch off hall cooling in winter and transition months to lower the base load within the painshop section by reducing power consumption.

Reduce the pool temperature and adjust the infrared zone and the standby times in painting to thereby reduce gas consumption.

Use rainwater for vehicle paint-work.

Use water-based paint or alternative coating technologies to reduce the need for solvents.



Waste management

LOCAL WASTE MANAGEMENT

Implement a waste management programme that measures output and identifies hazardous waste to deal with it accordingly.

Provide recycling bins, segregate waste and schedule waste collection dates to reduce landfill emissions, promote the circular economy and realise efficiency potential.

Avoid waste as much as possible and implement local recycling pro-grammes for waste that can't be avoided.

Engage with local disposal companies to schedule pick-up on demand through smart systems to reduce emissions by eliminating unnecessary trips.

Apply clear visuals to separate types of waste on bins to make it easier for employees to dispose of waste properly.

Repair broken IT and office equipment. Once it needs to be re-placed, donate it instead of disposing of it, promoting further use and decreasing electronic and other waste.

Provide reusable tableware such as cups and utensils, including outside of the canteen, instead of disposable items.

Encourage furniture sharing in an office space to reduce the waste generated from the disposal of furniture that is still in good condition. Before discarding furniture, check whether the furniture can be donated to extend its lifecycle and reduce waste.

Digitalise local work processes and save paper. For example, use digital business cards or invoices. If paper cannot be avoided, only use recycled paper.

Use as little packaging material as possible if spare parts or similar are sent locally. Whenever possible, use biodegradable packaging materials.

Order commodities in larger quantities whenever possible. This saves packaging materials and simultaneously reduces your emissions.

Provide refill containers and pump bottles for soap and washing-up liquid so that disposable packaging can be avoided.

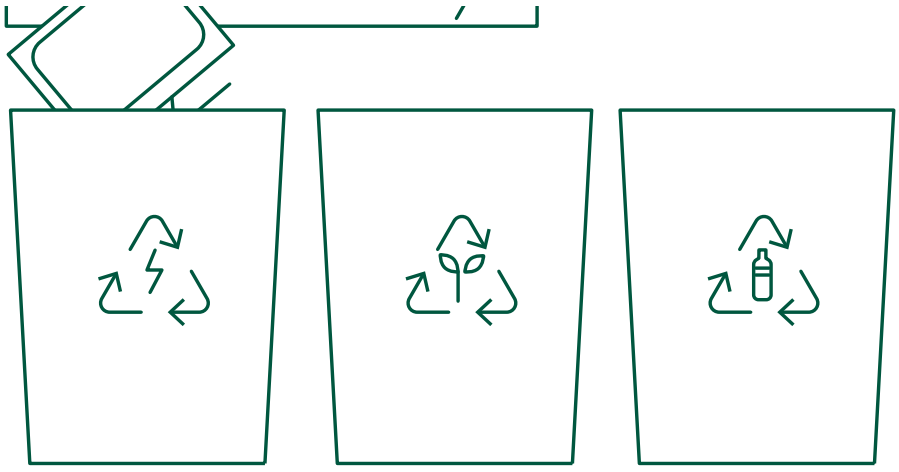
PRODUCT-RELATED WASTE

Optimise the use of materials in production, maintenance, refurbishment and/or remanufacturing by minimising scrap and waste.

Encourage the reuse of materials, components and packaging within the production, maintenance, refurbishment and/or remanufacturing process. This reduces emissions and saves money.

Identify and establish partnerships with industries/companies in your geographical surroundings to generate industrial symbiosis. This can reduce the need for new resources, promoting the circular economy, minimising waste disposal, de-creasing emissions and energy consumption, and creating new sources of revenue.

Optimise the use of lubricants and coolants by only using the minimum amount necessary to avoid over-usage and improve resource efficiency.



Mobility

GENERAL

Provide charging stations for electric vehicles (cars, bicycles, etc.) that run on electricity from renewable energy sources and thus pro-mote electromobility among employees and customers.

COMPANY CARS

Install photovoltaic (PV) systems on carport roofs to help cover the electricity needs of car parks with clean and renewable energy. This can also be connected with green roofs (see: Biodiversity).

When selecting company vehicles, choose only fully electric models. This is in line with the corporate guidelines. Electric drivetrains reduce emissions.

Use optimised route planning in customer service. This enables a reduction in trips, saving costs and emissions.

COMMUTING

Offer your employees incentives to use public transport, for example by subsidising monthly tickets. This promotes the shift from private cars to public transportation.

Make the charging infrastructure on the company premises accessible to all employees and private vehicles to incentivise the switch to electric vehicles.

Offer your employees leasing options for private electric cars to reduce the number of more emission-intensive combustion vehicles.

Offer an employee shuttle service to transport employees to certain destinations, e.g. work locations that are difficult to reach, so that emissions caused by individual journeys are eliminated.

Provide a network for carpooling or offer car sharing for employees.

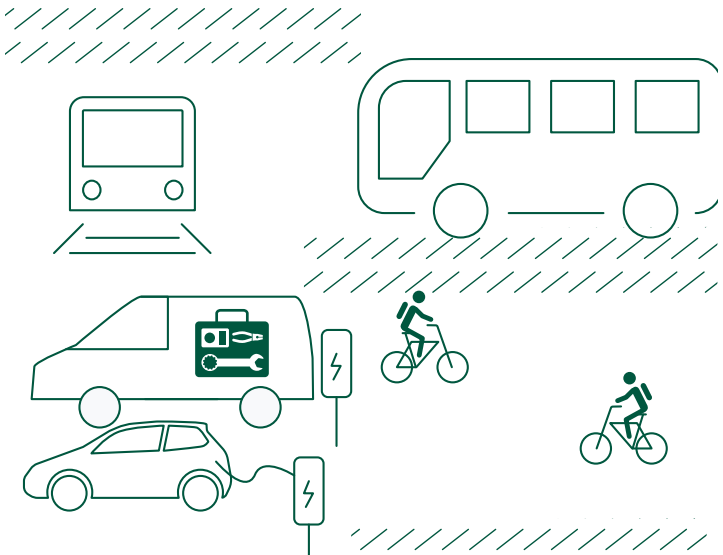
Make use of the available options for mobile work and teleworking in order to enable employees to carry out tasks remotely that do not re-quire an on-site presence. This helps reduce emissions from trips to the company building.

BICYCLE MOBILITY

Create infrastructure for cyclists on the company premises. This includes theft-proof, weather-protected bicycle parking facilities, repair facilities including an air pump station, and charging stations for e-bikes.

Offer incentives for employees to commute by bicycle. For this purpose, leasing options such as JobRad, Lease a Bike, Kleta or similar models are suitable.

In terms of indoor facilities, showers, lockable lockers and changing rooms can be provided for employees so that they have the opportunity to freshen up afterwards, what-ever the weather.



BUSINESS TRAVEL

Choose online meetings to reduce emission-intensive business travel whenever possible. This saves costs and emissions.

Prioritise train travel over short flights whenever possible. If that is not an option, consider travelling by car. When booking through a travel agency, request the selection of environmentally friendly transportation and accommodation. This reduces negative environmental impacts and saves costs.

Make train travel more attractive. Offer your employees discount cards from the national railway company for business trips, e.g. the BahnCard in Germany or the Tarjeta Renfe in Spain, and allow travel in first class. This saves costs and emissions.

Prioritise sustainable hotels when planning business trips. Sustainable hotels implement measures such as water conservation, energy efficiency, waste reduction, environmental management and biodiversity promotion. When booking, look for recognised labels such as “Green Globe”, “Green Key”, “GreenSign” or the “EU Ecolabel”. This reduces emissions from unavoidable hotel stays. When booking through a travel agency, also make them aware of this, so that the most sustainable travel option can be chosen.

Offer shared travel options for group trips to avoid emission-intensive individual trips. This reduces both the number of trips and emissions.

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Transportation and Warehousing

When renting warehouse space, ensure it is powered exclusively by electricity from renewable sources and avoid oil or gas heating. This saves emissions during the storage of products and materials.

Reduce emission-intensive transportation. Choose low-emission modes of transport in the following order from lowest to highest emissions: maritime transport → rail transport → road transport → air transport.

Reduce fuel emissions by using the fuel with the lowest emissions with-in each mode of transport (e.g. electricity from renewable energy or LNG). In doing so, keep the previous point in mind and preferably choose low-emission modes of transport.

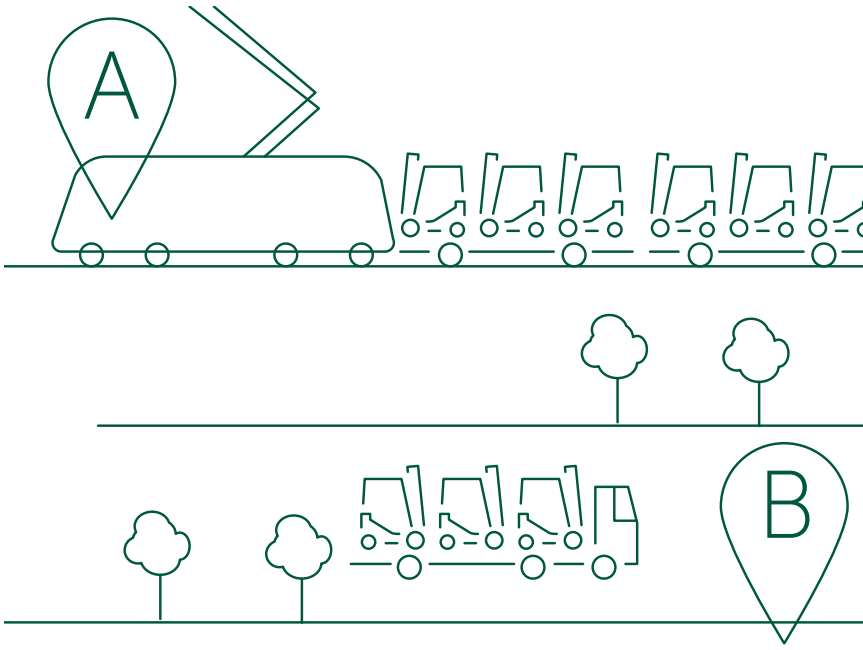
Ensure the high utilisation of trucks and containers to avoid extra trips. Also, choose the optimal package, pallet and crate sizes. This reduces the number of trips, meaning you save costs and emissions.

Expand the use of electric trucks, e.g. as shuttles between warehouse locations, to reduce emission-intensive truck journeys with combustion engines.

Consolidate trips and plan delivery routes that are as direct as possible to reduce negative environmental impacts. A management system like "Smart delivery planning" can sup-port this. This reduces the number of trips and saves both costs and emissions.

Place bulk orders whenever possible to reduce the number of trips. This saves both costs and emissions that would be generated by each individual delivery.

Reuse transportation aids such as anti-slip mats as well as protective caps for data connectors and battery terminals to reduce material consumption during transport.



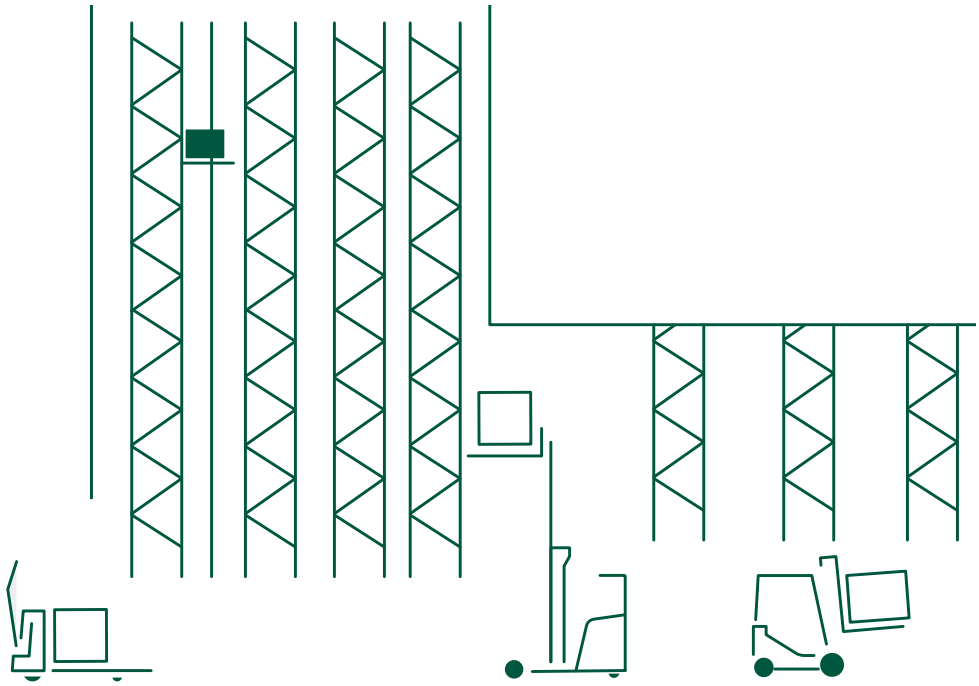
Product use

Choose the right battery size. This reduces emissions from the production of oversized batteries and lowers electricity consumption during the use phase.

Operate our products exclusively with electricity from renewable energy sources. This improves both your and our CO_2e footprint.

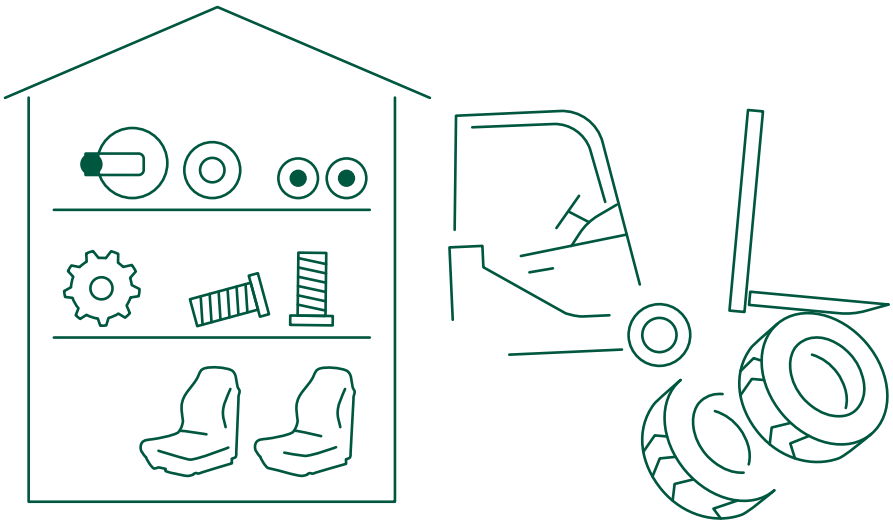
Make use of advisory services on "intelligent charging" and charging management during the operation of our products. Proper charging extends battery lifetime and helps reduce costs as well as emissions that would otherwise result from the premature replacement of batteries.

Consider using "JUNGSTARS" to reduce resource consumption and emissions associated with the production of new vehicles.



End of product life

Use decommissioned industrial trucks as a "spare parts warehouse" for maintenance and after-sales service – for example for wheels or control units. This keeps components in the loop and reduces both costs and emissions.



“We have a corporate and personal responsibility to leave a world worth living in to future generations.”

Dr Lars Brzoska,
Chairman of the Board of Management

Sustainable corporate governance is firmly anchored at Jungheinrich. As a family-owned, listed international company, local and global responsibility and a commitment to generational responsibility are part of all business decisions. As a pioneer of electrification – from the first electric forklift truck when the company was founded in 1953, to 100 per cent electric production in its 70th anniversary year in 2023 – Jungheinrich has been thinking about technology with the triad of “planet, people and profit” in mind from day one of the company’s history.

Sustainability is anchored in the corporate strategy 2030+ and thus determines both future orientation and day-to-day business. At Jungheinrich, we are pursuing the long-term vision of “climate neutrality” and are aiming for “net zero” by 2050 according to SBTi. In doing so, we are not only leading the way as a driver on the path to sustainable material handling, but are also acting as a sustainability enabler in many key industries and thus supporting our customers and partners in making their business more sustainable. Together, we are shaping the future of warehousing: efficient, circular-ready and safe.

Our basic attitude of partnership is not only reflected in our business relationships, but also in the fact that we recognise that we achieve the most as a community. That is why we have joined carefully selected initiatives that pay attention to various aspects, such as the Science Based Targets initiative, the United Nations Global Compact, and econsense, the German Business Forum for Sustainable Development.

Our compliance profile on Integrity Next shows our rating in terms of human rights, the environment, compliance and our own supply chain. This self-assessment is confirmed by the highest independent ratings and successful certifications, such as our EcoVadis Platinum status. This puts us in the top one per cent of the world’s most sustainable companies.

This is a living collection; new measures and categories will be added.

The Jungheinrich Sustainability Team is available for your questions and to discuss matters at any time.

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