ALBIN KNAUDER, DANIEL KREUZER, AND BERNHARD ZAHRL – THE HOSPITALLER ORDER OF SAINT JOHN OF GOD, AUSTRIA

Navigating the road to net-zero CO_2 emissions

Albin Knauder, Daniel Kreuzer, and Bernhard Zahrl of Hospitaller Order of Saint John of God, one of the largest private non-profit healthcare providers in Austria, analyse how the twin aims of providing healthcare and pursuing a carbon neutral policy can be reconciled.

The health sector is responsible for 4.4 per cent of global net emissions (two gigatons of carbon dioxide equivalent) and the climate footprint of the health sector is equivalent to the annual emissions of 514 coal-fired power plants. If the health industry were its own state, it would be the world's fifth largest emitter.[1]

The health industry is therefore in an unexpectedly paradoxical situation: on the one hand, it is called to promote the health of all of us, to heal and alleviate illnesses and, where healing is no longer possible, to accompany people on their final journey. On the other hand, it is one of the biggest emitters of harmful greenhouse gases and causes lasting damage to the environment.

However, many different, efficient, and sustainable 'therapeutic measures' can be taken. The environmental management of the Hospitaller Brothers of Saint John of God, one of the largest private non-profit healthcare providers in Austria, therefore extends to all areas of their hospitals and other care facilities.

How the Brothers of Saint John of God protect the environment

"Man is not above creation, but a part of it."

In order to do justice to the issue of sustainability, the Brothers of Saint John of God have decided to focus on environmental protection – in particular on de-carbonisation – and in recent years have also succeeded in certifying all operational facilities according to the EMAS III environmental management system.[2]

With this system, the management has both the basis and key figures for decisions that will reduce or avoid environmental impacts in the future. Environmental aspects are identified and assessed by an environmental officer with the support of local environmental teams. For each individual activity, direct and indirect emissions to air, noise, water consumption, discharge of in-house waste water, material efficiency, and indirect environmental impacts such as transport, purchasing, and construction are assessed. To evaluate the environmental aspects, the system of utility value analysis is applied, which records the various factors of environmental impact. Energy use has emerged as the most significant environmental aspect across the organisation, followed by waste generation and water consumption.

Daniel Kreuzer **Albin Knauder** **Bernhard Zahrl**

•**Daniel Kreuzer** is a trained electronics and communications technician. He was technical director of the Order's hospital in St. Veit/Glan (Carinthia) for almost 20 years before moving to provincial management in 2019. There he is strategically and organisationally responsible for the areas of construction, facility management, and medical technology. His areas of responsibility include the facilities in Austria, the Czech Republic, Slovakia, and Hungary. He has been a board member of the Austrian Association of Hospital Engineers since 2017.

•**Albin Knauder** studied environmental management. From 2004 to 2021 he was head of the ecology department of the Kärntner Krankenanstalten Betriebsgesellschaft (KABEG) and responsible for waste management, hazardous goods, energy management, waste water management, environmental management, and EMAS III certifications. He has been the environmental officer of the Brothers of Saint John of God in Austria for several years. Knauder is a member of the working group on ÖNORM S2104 (medical waste) of the Austrian Standards International. He is also a member of the Austrian Waste and Environment Forum and gives expert lectures.

•**Bernhard Zahrl** has been the head of corporate communications in the Austrian Province of the Hospitaller Brothers of Saint John of God since 2001, where he coordinates a team of over twenty colleagues in the individual centres. He is also responsible for a monthly health magazine. Bernhard has been involved in environmental protection since his youth.

Motivation to act

The fact that the Hospitaller Order of Saint John of God is intensively involved in the area of environmental protection might be surprising at first glance. But environmental protection and sustainability are fundamental concerns. As early as 2000, an internal document stated: "We must foster strategic attitudes which create responsible relationships with the environment in which we live and which we share, and of which we are merely its stewards."[3]

Another milestone was the publication of the encyclical *Laudato si'* by Pope Francis in 2015. Sentences such as: "There is an urgent need to develop policies so that, in the next few years, the emission of carbon dioxide and other highly polluting gases can be drastically reduced, for example, substituting for fossil fuels and developing sources of renewable energy.

Worldwide there is minimal access to clean and renewable energy"[4] are an obligation for a Catholic order to act ecologically and to end the emission of CO_2 into the atmosphere as quickly as possible.

From the Pope's point of view, we are all called upon not to leave environmental protection to chance and to take responsibility for creation. As a religious community active in 52 countries around the world, the Brothers of Saint John of God have taken up this guiding principle.

Energy and CO_2 goals in Austria[5]

CO_2 emissions are produced directly or indirectly in daily operations. Directly through heating systems, combustion engines of cars or trucks in the company's own fleet, the use of emergency power generators or steam generators powered by natural gas for air humidification, and indirectly via the production of electricity, community heating, and community cooling.

The main goals formulated were CO_2 neutrality of all Austrian facilities and energy supply from sustainable and fossil-free energy sources. These two goals were in turn divided into sub-goals:

- Use of renewable energy sources as a basic requirement.
- Heat supply from renewable energy sources or industrial waste heat.
- Producing green electricity from photovoltaic systems, with existing roof surfaces utilised to the maximum.

In order to achieve these ambitious goals, it is necessary to do more than just change energy suppliers to switch from nuclear power to electricity from hydropower plants. Numerous additional and accompanying activities are needed; a 'special toolbox' is required:

- Constructional assessment of all buildings and construction of new buildings only in accordance with ecological, sustainable guidelines.
- Introduction of a company-wide energy system with standardised key figures.

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The Provincial of the Austrian Province, Frater Saji Mullankuzhy, and Federal Minister Leonore Gewessler.

- Establishment of a management system for the acquisition of state or local subsidies.
- Cooling of buildings by means of community cooling via community heating networks, wherever possible.
- Promotion of sustainable procurement.
- Promotion of e-mobility, including the construction of charging infrastructures.
- Maximum expansion of photovoltaic systems (electricity) and solar thermal energy (heat).
- Use of new technologies (hydrogen, electricity storage, etc.).
- Switch to climate-friendly anaesthetic gases and recycling.

How to achieve these goals step by step

In order to achieve the reduction of CO_2 emissions, it was necessary, both in the individual facilities and at the highest management level, to achieve a voluntary commitment to environmental protection. At the same time, a resolution was passed to certify all Austrian facilities according to the EU's environmental management system EMAS.


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Leonore Gewessler presents EMAS III certificates to the Order's managing directors.

The Hospitaller Order of Saint John of God

The Hospitaller Order of Saint John of God is a Catholic order that maintains about 400 health and social service facilities in 52 countries worldwide.

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In the Austrian Province of the Order with locations in Austria, the Czech Republic, Hungary, and Slovakia, the Brothers operate twelve hospitals with almost 9,000 employees at nearly 40 locations, as well as numerous other social and health care facilities including care homes, residential groups for people with disabilities, a drug addiction treatment centre, a dialysis facility with 72 places, several hospices, and spa and wellness facilities.

In 2021, despite the Corona pandemic, 114,095 inpatient admissions, 745,244 outpatient contacts, and 49,656 operations were performed at Austrian centres.

Following the example of the founder of the order, St. John of God (1495-1550), the Hospitaller Brothers of Saint John of God care for people regardless of origin, religion, gender, or social status, and want to be available to all those seeking help according to their possibilities. Their facilities are accordingly available to all people as private non-profit institutions. Another characteristic of the Order is the attempt to address pressing problems in the health and social sectors with innovative and sustainable solutions and to implement them with professionalism and Christian charity.

Environmental teams have been created for each facility, responsible for both the continuous improvement of environmental performance and the operational implementation of the environmental programme. Teams meet at regular intervals and environmental concerns as well as those projects that have an ecological impact are dealt with. When assembling the environmental team, care is taken to ensure that all departments of the respective hospital or care facility are represented as far as possible.

The environmentally conscious behaviour of employees contributes significantly to improving environmental performance. To integrate environmental protection into everyday work, all important guidelines are available on an intranet. In addition to information in the employee magazine, employees are informed about the environmental impact and environmental performance of the respective site through information events and training courses, regular posts in the site-specific employee apps, notices, or posters.

CO_2 neutrality within reach

In the course of the EMAS certifications, the company management set the goal of halving CO_2 emissions by 2025 compared to the base year 2017 and achieving climate neutrality by 2030. Thanks to the motivation and commitment of all employees, the milestone goal of halving CO_2 emissions was almost reached as early as 2022 with 48 per cent. The goal of a CO_2 neutral energy supply by completely phasing out fossil fuels (oil and natural gas) was brought forward by four years and is now planned for 2026.

However, it is important to point out that a complete avoidance of CO_2 emissions is probably not technically possible from today's perspective. Diesel-powered emergency generators in hospitals or special vehicles of a company fire brigade cannot currently be technically replaced by sustainable emission-free products. From today's perspective, carbon zero is therefore only 98 per cent achievable for an operator of hospitals and care and nursing facilities.

Examples already implemented

By 2022, photovoltaic systems with a total output of just over 600 kWp (kilowatt peak, defined as the maximum output of a photovoltaic system in kilowatts) were put into operation. Some facilities of the Brothers of Saint John of God have existed for 400 years and are mostly located in historic city centres (Vienna, Graz, Salzburg, etc.). Accordingly, many visual and technical requirements had to be solved with regard to the protection of historical monuments.

For example, during the renovation of a home for the elderly in Linz, a solar thermal system with a collector area of 200 square metres and a photovoltaic system with an output of 31 kWp were installed.

By using district heating from biomass power plants or industrial waste heat, heating systems with fossil fuels are no longer necessary. A hospital in Graz, for example, will be heated in future with waste heat from a nearby paper factory.

In Kritzendorf, a retirement home was able to save 400,000 litres of heating oil annually by connecting to a local biomass heating plant and 54 per cent of CO_2 emissions in a very short time by installing a photovoltaic system with 140 kWp.

An extremely successful example of sustainable energy production can be found in Kainbach near Graz in a facility for people with disabilities. Part of this facility site is a forest area. The management of this forest includes the production of wood chips, which are used in a newly constructed heating system for ecological heat generation.

Photovoltaic system on the roof of the St. Veit/Glan hospital (Carinthia, Austria).

The construction of a photovoltaic system with an output of 100 kWp additionally contributes to the sustainable reduction of CO_2 emissions.

A central purchasing department is a key position in environmental protection. The more ecologically conscious purchasing is, and the more sustainable the purchased products are, the greater the benefit for the environment and thus also an indirect reduction of CO_2 emissions. A procurement catalogue was therefore developed for the sustainable procurement of medical and nursing consumables and implemented at all locations. This is because disposable items are increasingly being used, especially in medicine, which means that the amount of waste is constantly increasing. Another reason for higher waste generation is that the life cycle of many products is shortening. For example, 80 per cent of all products are thrown away after a single use and 99 per cent of materials become waste after six weeks.

Great potential for the reduction of

CO_2 has been identified in information technology. A combination of many measures contributes to the ecologically responsible operation of the infrastructure:

- Environmental aspects such as energy efficiency, ecological footprint during production, materials used, etc. are taken into account when purchasing products.
- Ongoing measurements of the energy consumption of the equipment in the server room of the data centre, in terms of utilisation or temperature, show possible reduction potential.
- Eco-friendly disposal of old appliances.
- Reducing the amount of data in the active system environments by deleting and archiving data in order to be able to reduce hardware requirements.
- Determining the necessary availability of applications and services in order to be able to define possible periods of non-operation/shutdown of systems.
- Systems with rotating spindles (hard disks) are no longer allowed, only systems with SSDs are purchased. Currently, 90 per cent of the clients have already been converted to SSDs. (SSDs in clients require only 25 per cent of the energy of hard disks.)
- Physical servers were migrated to virtual environments as far as possible in order to minimise the need for hardware servers or to realise synergies.
- All systems are regularly checked, maintained, and replaced when necessary to achieve the best possible efficiency.

Sustainable issues and goals are the order of the day

The focus of all activities is always on the persons cared for and the mission to "cultivate and tend the Garden of Eden." In concrete terms, the Brothers of Saint John of God are guided by Pope Francis' environmental encyclical *Laudato si'*. This creates the best possible framework conditions for employees to carry out their daily work. For the topic of sustainability, the essential topics and goals can be summarised as follows:

- Socio-cultural and functional quality (ensuring health and well-being in the building, humane environment).
- Economic quality (reduction of life cycle costs, preservation of economic values through space and energy efficiency).
- Ecological quality (protection of the environment, conservation of natural resources).

Significant changes in the global energy market make the issue of energy a future topic of particular importance for the Brothers of Saint John of God. In addition, the reduction of energy use is an essential factor for effective environmental protection.

To ensure that we do not meet our present needs at the expense of future generations, the Hospitaller Brothers of Saint John of God are constantly working on innovative and sustainable environmental projects. **IFHE**

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4 Encyclical Letter *Laudato si'*, Vatican 2015 Ch 26. (https://www.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html.)

5 These targets are currently based on Scope 1 and 2. The implementation of Scope 3 is being planned.