

The image shows a young girl in a pink sweater pointing upwards with her right hand. She is looking up and to the right with a curious expression. In the background, a female healthcare professional in dark scrubs is smiling and looking towards the girl. The setting is an MRI room, with a large circular opening of the scanner visible on the right. The lighting is a mix of blue and purple, creating a futuristic and calm atmosphere.

PHILIPS

Magnetic resonance

Sustainability in MRI

Deliver quality care while reducing environmental impact



“ We are able to have excellent image quality while also respecting natural resources.”

Experience with MR BlueSeal from Dr. Stéphane Gellée,
Saint-Augustin Clinic in Bordeaux, France

[Learn more on Philips sustainability >](#)

Doing business responsibly and sustainably

Addressing the CO₂ challenge

Healthcare systems globally account for over 4% of global CO₂ emissions¹. That’s more than aviation or the shipping industry. The United States health sector, the world’s number one CO₂ emitter in both absolute and per capita terms, produces 57 times more emissions per person than does India.² Continuation of pollution at this level is unsustainable.

Adopting prudent sustainability practices in healthcare can have significant impact on the environment. Purposeful conservation efforts must become commonplace. At Philips, our commitment to participate in global sustainability efforts, means every part of the company joins that effort. We are laser-focused on helping to mitigate climate change through the mindful use of energy and materials. Initiatives in the manufacture and lifecycle of our MR systems reflect this imperative. At Philips MR, we operate in a way that decreases the consumption of scarce resources such as helium and energy, and reduces material waste through a process of upgrading, refurbishing and recycling.

When you choose Philips, you are choosing a partner committed to meet sustainability and circular economy ambitions. As a leading health technology company, our purpose is to improve people’s health and well-being through meaningful innovation, positively impacting 2.5 billion lives per year by 2030. We aim to grow Philips responsibly and sustainably, and are ready to help you grow your business and meet your sustainability ambitions.

Since 2020, Philips has been carbon-neutral in its operations (site, logistics, travel), and sources all its electricity from 100% renewable resources.³ We will maintain carbon neutrality and use 75% renewable energy in our operations by 2025. We will reduce CO₂ emissions in our entire value chain in line with a 1.5 °C global warming scenario (based on Science Based Targets). Our attention is now directed to designing and developing every piece of health tech equipment toward this goal. For Philips MR this means working to improve energy efficiency, upgradability, serviceability, refurbishment, and recyclability across the product lifecycle.

[Learn more on sustainability in MR >](#)

The benefits of circularity

Today there is an industry shift from the linear 'take-make-dispose' management model to a circular 'make-use-return' model – the so called, Circular Economy. Innovative service programs, smart upgrade paths, and product take-back and refurbishment programs are not only good for the planet and improving people's lives, they also make good business sense for you, the healthcare provider.



We consciously design our MR solutions by mindfully sourcing and effectively using enhanced materials. We embed sustainability in our innovation processes with the goal to reduce the total environmental impact. We aim to design all our new products and services as to improve the energy efficiency of our products, using less resources and more recycled content, avoiding the use of hazardous substances, designing for circularity, and making our packaging easier to recycle and re-use. At Philips MR we drive circularity in three ways:

Product design:

Our products are designed in line with EcoDesign principles that aim to reduce the environmental impact across the product life cycle. With EcoDesign, we embed sustainability in our innovation processes. The difference between EcoDesign and conventional design is the clear goal – right from the start of the innovation and design process – to reduce the total environmental impact.

Lifetime extension: We extend the Philips product lifetime by upgrading and/ or renewing (parts of) your Philips MR system during the life cycle

Closing the loop: At the end of the product lifecycle, when you are ready to return the Philips system to us, we offer strong trade-in value⁴, and then responsibly refurbish, reuse and/or recycle it

Ecodesign focal areas



Energy

Energy consumption is often the single most important factor in determining a product's lifecycle environmental impact. By improving the energy efficiency of a product, we can reduce its energy consumption and carbon footprint.



Substances

Products are made using a range of substances, some of which may have an impact on people's health or the environment. By minimizing or eliminating the use of hazardous substances, we can reduce our products' health and/or environmental impact.



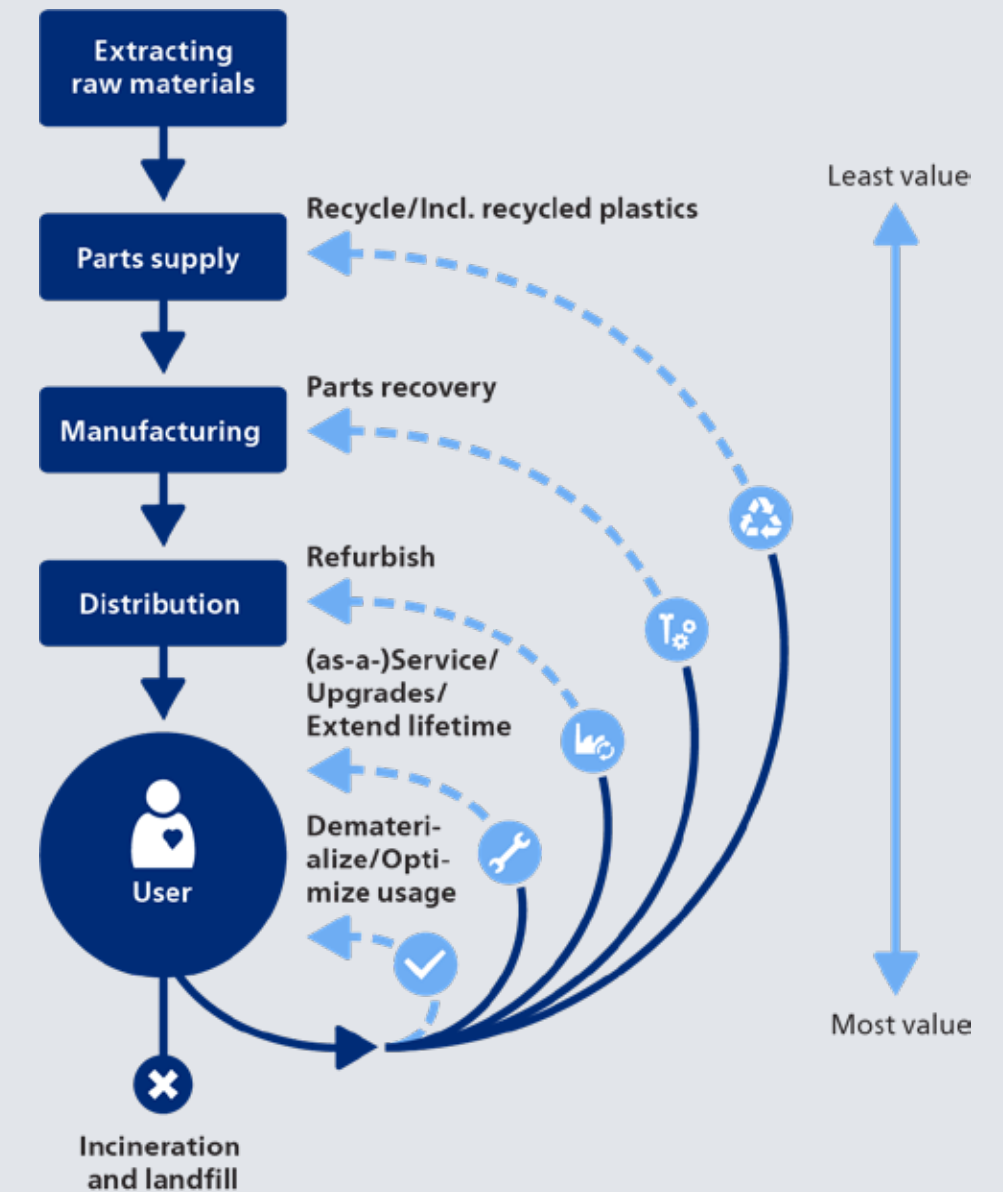
Packaging

Material, weight and volume reduction, along with smart material choices (e.g. from recycled and/or certified renewable sources, 100% recyclable, easily separable), helps minimize resource consumption and environmental impact over the life cycle of the packaging. At the same time, designing packaging to be reusable, recyclable or compostable also ensures it is circular economy-ready.



Circularity

Circularity refers to the potential of a system, product or component to contribute to the circular economy. It is calculated by assessing environmental performance over multiple life cycles, taking into account, for example, the recovery of materials and their reuse in new products. Upgrading, serviceability, refurbishment, spare parts harvesting, increased recycled content and recyclability, weight reduction, selection of more sustainable materials – these all help to reduce resource consumption. Circularity also includes product lifetime; longer lifetime reduces the resource consumption and transportation emissions associated with the introduction of new products.



Product Design - Reduce the consumption of scarce helium

A significant reduction in helium usage

The healthcare industry is the world's largest consumer of helium, accounting for around 30% of global use.⁵ Although helium is one of our planet's most naturally abundant gases, supply issues have made this resource scarce. Today's MRI scanners are acutely inefficient as their magnets are not fully sealed, with the potential of helium gas escaping. The average MRI scanner requires approximately 1,700 liters of liquid helium⁶ that must be periodically replenished, and there are roughly 50 thousand⁷, helium-cooled MRI scanners in use around the world today.

Philips BlueSeal magnet uses a highly efficient micro-cooling technology that requires only a negligible amount of liquid helium for cooling. This tiny amount of liquid helium is sealed in the magnet. No liquid helium can escape during the magnet's lifetime⁸. This reduces potential long interruptions to MR services due to helium-related issues and eliminates helium refill costs.

Additional BlueSeal benefits:

- No need for a vent pipe
- Easy discharge and re-energize capability
- 0.5% of today's standard helium amount is used for efficient MR operations⁹
- Up to 1700 kg lighter than conventional magnet⁹

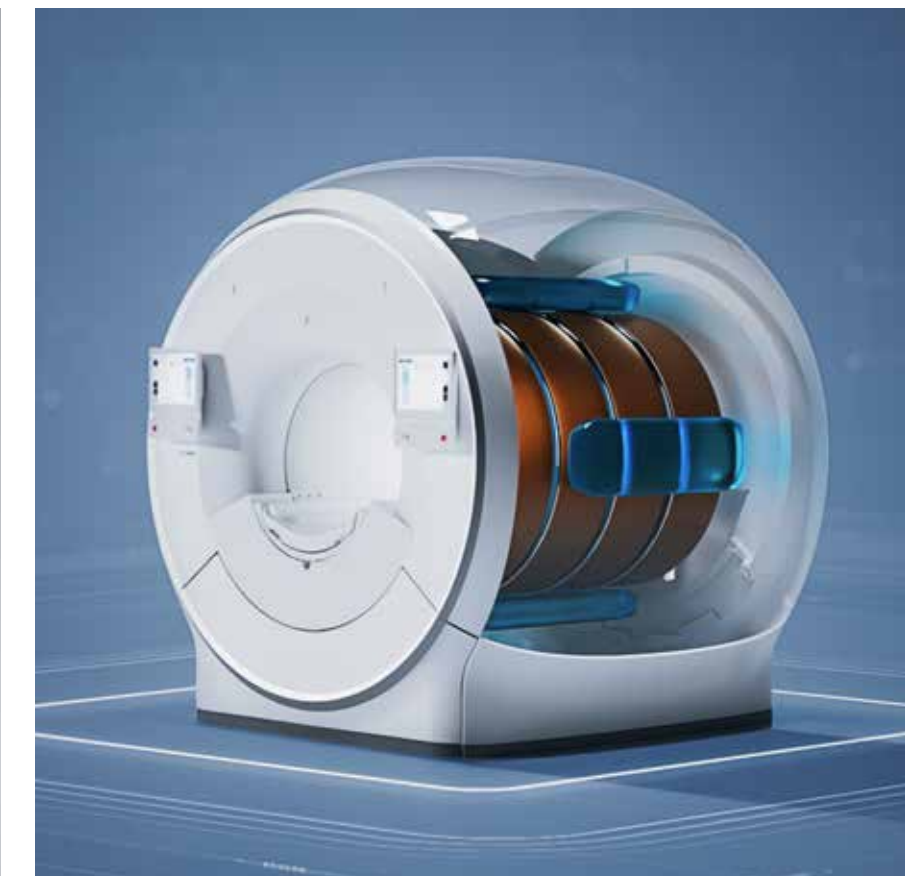
"This machine will save us money and help us be more environmentally friendly"

Experience with MR BlueSeal from Dr. María del Mar Travieso
Hospitales San Roque, Spain

With over **1500 units installed globally**, MRI scanners equipped with Philips' BlueSeal magnet technology have already **saved more than 2.75 million liters of helium**¹⁰ since 2018 (status December 2024).



Classic magnet technology - ~1,500 liters of liquid helium



BlueSeal micro-cooling technology - ~7 liters of liquid helium



Product Design - Proactive energy management

Our MR systems have been designed to respond to the energy challenge.

1. High gradient system efficiency (3.0T).

This lowers the demands on the gradient amplifier power and also reduces the heat dissipation within the gradient coil. Minimizing the power that the gradient amplifier needs to supply, as well as the power consumed and dissipated by the gradient coil.

2. Reduce power consumption through smart power management.

Philips PowerSave+ is built around two design principles: lowering the level of energy consumption when the system is not in use, and lowering the level of energy consumption between scans. PowerSave+ enables our MRI systems to work effectively with both 50Hz and 60 Hz power sources.

3. Reduce power consumption by scanning faster.

At imaging speeds nearly three times faster than parallel imaging (and 65% greater resolution¹¹), Philips SmartSpeed reduces acquisition time. As a result patients spend less time in the magnet, helping to reduce electricity consumption, improving shift schedules, and allowing for enhanced utilization of service hours.

Hospitals consume nearly two-and-a-half times more energy than other commercial buildings, spending more than \$8.7 billion per year according to the EPA.¹² They are currently the second most energy-intensive building type in the U.S.¹³ As an example, a typical 200,000-square-foot hospital with 50 beds might spend around \$680,000 or \$13,611 per bed annually on electricity and natural gas.¹⁴ This is a substantial investment. Additionally, there is a considerable environmental impact from this high level of energy consumption. In fact, the healthcare industry is among the most carbon intensive service sectors in the industrialized world. It is responsible for 4.4 to 4.6% of worldwide greenhouse gas emissions.¹



1. High gradient system efficiency (3.0T)

Gradient system efficiency, which is largely determined by gradient coil sensitivity, determines how much power is required to simultaneously achieve a specific gradient amplitude and slew rate. A high efficiency lowers the demands on the gradient amplifier power and also reduces the heat dissipation within the gradient coil.

As an example, the Ingenia Elition 3.0T X configuration is around 50% more efficient, as measured against a typical industry 'Configuration B'. This then minimizes the power that the gradient amplifier needs to supply, as well as the power consumed and dissipated by the Ingenia Elition 3.0T X gradient coil.

	Ingenia Elition X	Configuration B
Required power per axis	1.5MVA	203MVA
Gmax	45 mT/m	45 mT/m
SRmax	220 T/m/s	200 T/m/s
gradient coil efficiency &	0.0066	0.0044

Philips 3.0T gradient coil is approximately 50%¹⁵ more efficient than other 3.0T MRI's, leading to a lower power consumption when scanning



2. Reduce power consumption through smart power management

Philips PowerSave+ is our smart power management solution for MR. It is built around two design principles: lowering the level of energy consumption when the system is not in use, and lowering the level of energy consumption between scans. PowerSave+ enables our MRI systems to work effectively with both 50Hz and 60 Hz power sources.

The level of energy consumption between scans is driven by choices in gradient amplifier design. The regulated solid-state gradient amplifier uses energy only when the system is scanning, thereby lowering energy consumption in between the scans.

PowerSave+ is the result of our continued focus on improving the sustainability of our products. All Philips MRI systems adhere to the company-wide EcoDesign principle which (in part) commits to improving the efficiency of a product to reduce its energy consumption and carbon footprint.

Save almost 40MWh¹⁶ in energy per year by switching automatically to stand-by mode when the system is not being used for scanning

3. Reduce power consumption by scanning faster

At imaging speeds nearly three times faster than SENSE imaging, Philips SmartSpeed reduces acquisition time. It can also improve workflow to support high throughput and great productivity. Reducing acquisition times means patients spend less time in the magnet, helping to reduce electricity consumption, improving shift schedules, and allowing for enhanced utilization of service hours.

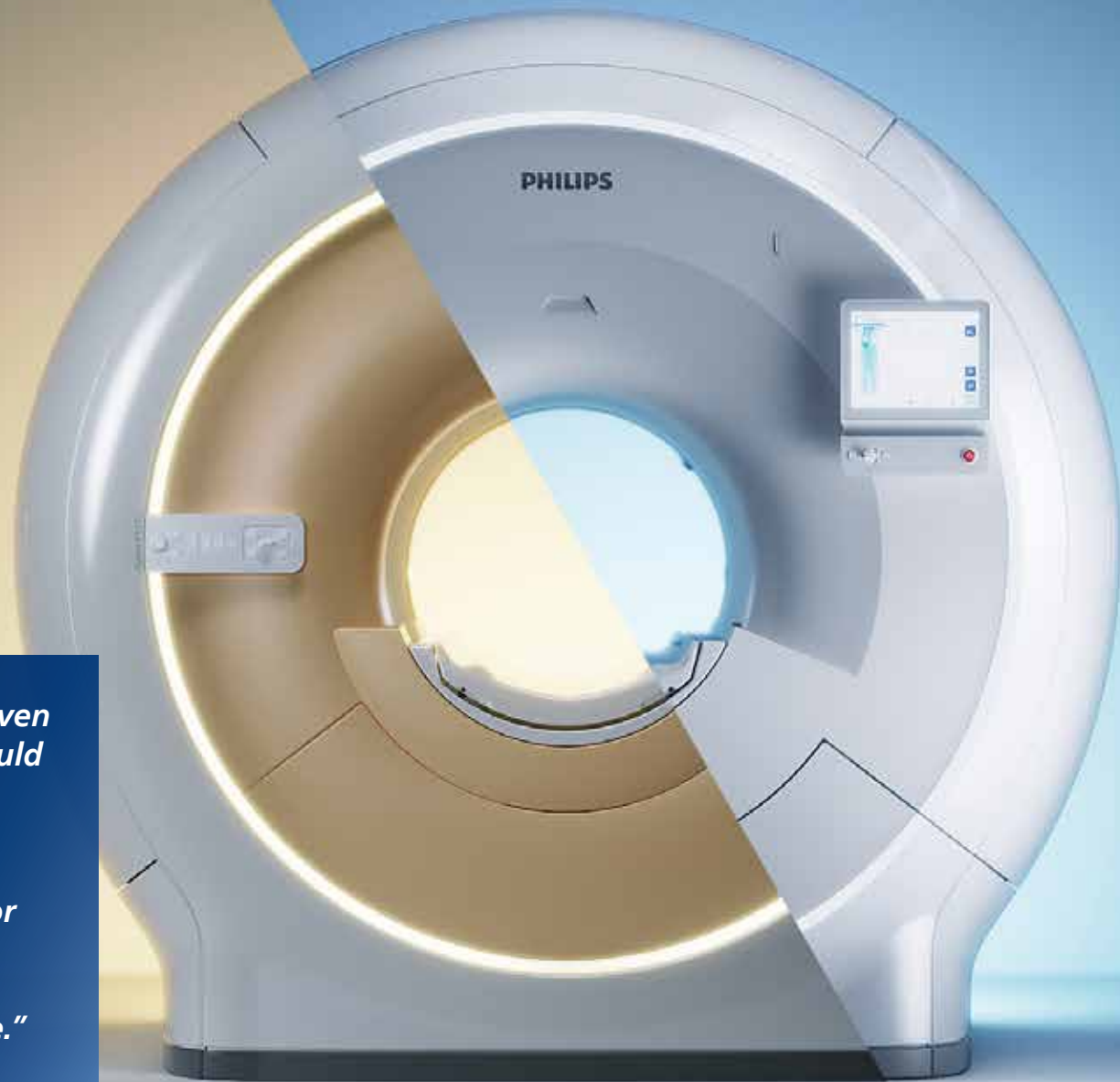
SmartSpeed delivers image quality and speed without compromise via award-winning AI technology¹⁷ and a state-of-the-art Compressed SENSE speed engine. Together, these technologies can be used to speed up scan time and boost image quality significantly on all anatomical areas and contrasts in 2D and 3D sequences.

SmartSpeed increases imaging speed by up to a factor of 3¹¹, provides up to 65% greater resolution¹¹ to deliver outstanding image quality, and is compatible with 97% of clinical protocols¹⁸. It covers motion imaging, imaging near implants, free-breathing imaging and diffusion-weighted imaging to address the needs of a broad range of patients in various conditions.

Reduce power consumption with SmartSpeed faster scanning and **save up to 59% per patient scan**¹⁹

[Learn more on SmartSpeed >](#)





“Replacing the proven Philips magnet would have been neither economical nor sustainable. In ten days to a system for the next ten years – that’s what I call securing the future.”

Dr Martin Kollerer, Radiologist,
Marktredwitz, Germany

Lifetime extension

Philips SmartPath enables you to upgrade your current equipment to the latest Philips MR technology in a practical, cost-effective, and sustainable way – to maintain your long-term success. Stay up-to-date with Philips newest functionalities, and extend the lifetime of your equipment.

With this program, you can completely convert your current Philips MR system, just as if you had purchased a new one, extending the lifetime of your equipment and improving your total cost of ownership. It enables you to boost performance with innovations such as touchless patient sensing technology, in-room patient set-up guidance, initiation of the exam at patient’s side, and our latest scanning techniques for fast, confident diagnosis of the most challenging indications.

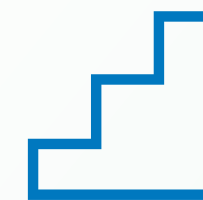
Save the CO2 emissions and energy usage that would be required to manufacture a new magnet with the MR SmartPath program. By keeping your existing magnet and upgrading it to the next generation of MR you save the costs of transporting, lifting and installing a new magnet weighing up to 3,000 kilograms.

SmartPath enables you to...



Optimize

Keep your equipment up-to-date



Enhance

Add functionality



Transform

Extend the lifetime of your equipment



Trade-in

Trade-in outdated equipment

[Learn more on MR SmartPath >](#)

Closing the loop

With pressure on costs and not all applications requiring new equipment, care facilities are keen to extend their equipment within a restricted budget without compromising on quality. Philips is committed to closing the loop by offering responsible take-back on all professional medical equipment sold directly to customers, as part of a trade-in offer or as a service at customer request. We ensure that equipment coming back to us is, where feasible, made available for refurbishment.

The Philips Circular Edition portfolio offers high-quality refurbished medical imaging systems at attractive prices. Circular Edition systems are on average 25% lower in price²⁰ compared to similar new Philips systems, without compromising on quality and performance. With the same warranty, service performance levels and training as new Philips systems, as well as a reduced carbon footprint, they are sustainable solutions that are as good as new.

With over 30 years of refurbishment experience, we know how to re-use resources effectively. Our refurbishment process re-uses 79% of average material weight²¹, which reduces the need for virgin materials, giving Circular Edition systems a lower carbon footprint than new ones. When used in France, the carbon footprint of a refurbished MR

system is 45% lower than that of a new one.²² Offering high-quality and sustainable medical imaging equipment at affordable prices, our Circular Edition portfolio can help you drive positive change for your facility while reducing the impact on the environment.

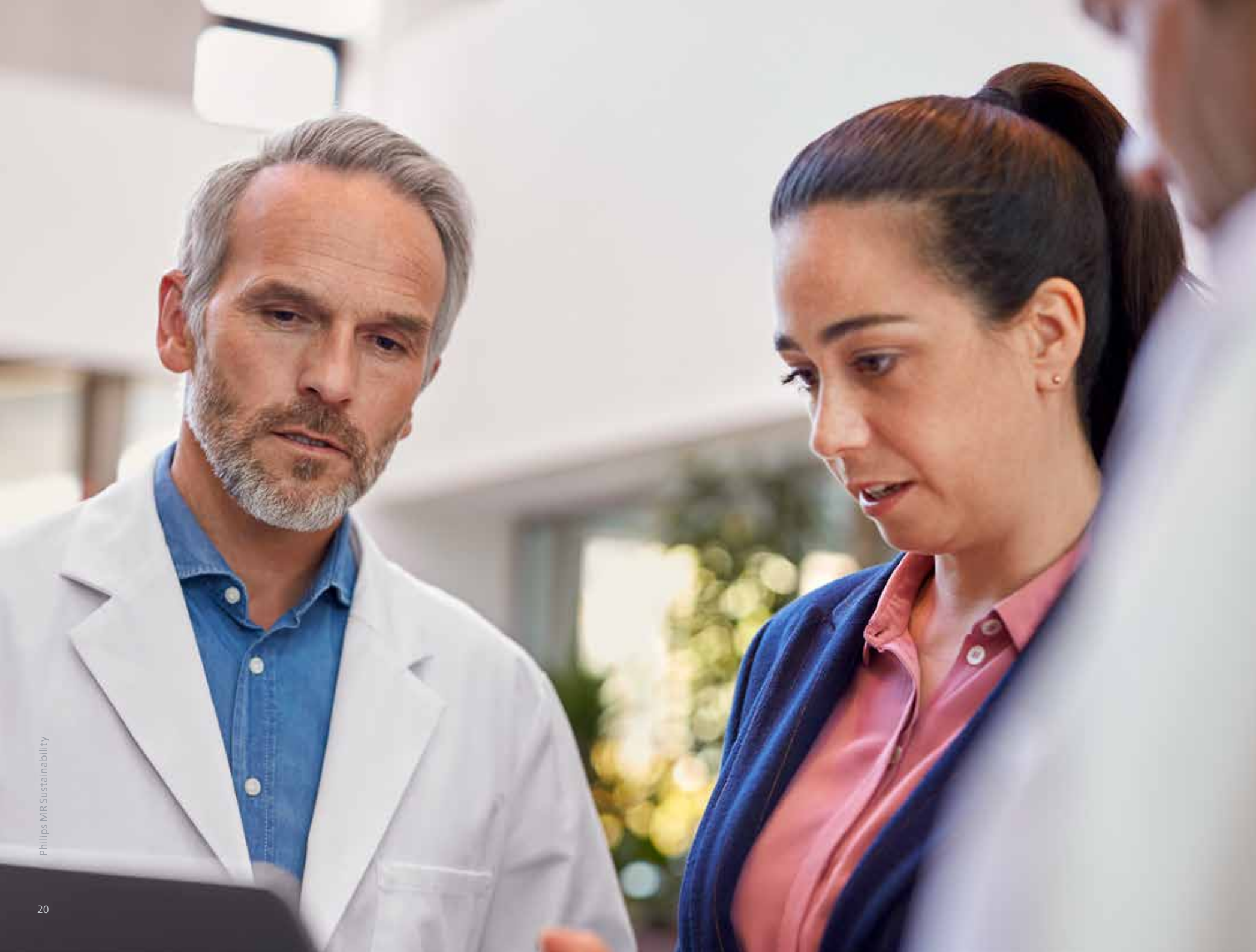
If refurbishment is not feasible, we ensure responsible end-of-use management, to prevent waste going to landfill. By recovering valuable parts, we can service older systems, maximizing lifetime value again. If that is no longer an option, we recycle back to raw materials locally via our certified global recycling networks.

A comprehensive process

The in-depth process starts by testing all key components and repairing or replacing defective or outdated components. This includes new gradient cables, water hoses, a rebuilt cold head and a new compressor absorber. All applicable system performance tests are executed, and image quality is measured against the original specifications. The system is delivered with the latest hardware console, the latest available OEM software at the time of ordering and a new accessory set, which includes all pads and straps.

[Learn more on Circular Edition >](#)





Partnering with an industry leader

Healthcare leaders like you are prioritizing environmental sustainability. The Future Health Index 2022²³ suggests that healthcare leaders have fast-tracked their sustainability plans. Today, almost one-quarter (24%) are prioritizing sustainability¹², and the same number plan to do so three years from now. Even 94% of patients consider a hospital's sustainability programs to be an important aspect of consideration.²⁴

As a purpose-driven company, we are conscious of our responsibility towards society and of the need to continue to embed sustainability ever deeper in the way we do business.

Good health and well-being



Improving people's health and well-being, and expanding access to care for underserved communities

Responsible consumption and production



Ensuring sustainable use of materials and driving the transition to a circular economy

Climate action



Providing sustainable use of energy, reducing emissions, and operating carbon-neutral

Partnerships for the goals



Teaming up with our suppliers to increase social and environmental impact throughout our supply chain

Our commitment to you is access to advanced magnetic resonance technology and services that provide a strong return-on-investment (ROI) and are designed to support improved health outcomes, improve the patient and staff experience, and lower the cost of care. At Philips, we are working to minimize our impact on the planet by taking climate action, driving the transition to a circular economy, implementing EcoDesign in our products, and partnering with our suppliers to reduce their environmental footprint. Working together, we can drive systemic change and deliver safe, efficient, and effective methods of care, that are sustainable too. And that means better health outcomes, at lower cost, and improved patient and staff experiences.

1. Eckelman, Matthew J., et. al., Health care Pollution And Public Health Damage In The United States: An Update, Health Affairs > Vol. 39, No. 12: Climate & Health <https://www.healthaffairs.org/doi/full/10.1377/hlthaff.2020.01247>, accessed 31/12/24
2. Health Care Without Harm (2019). Health care's climate footprint: How the health sector contributes to the global climate crisis and opportunities for action. <https://noharm-global.org/documents/health-care-climate-footprint-report>, accessed 31/12/24
3. Philips Annual Report 2023
4. Trade-in value is applicable for a limited time period and may change based on the type, model, and year of manufacturing. For more details please contact your local Philips representative.
5. Helium Market- Global Industry Size, Share, Trends, Opportunity, and Forecast, <https://www.mordorintelligence.com/industry-reports/helium-market>
6. Cincinnati Children's, December 11, 2019: <https://radiologyblog.cincinnatichildrens.org/what-is-a-quench-as-it-relates-to-an-mri-magnet/>
7. Magnetic Resonance, Chapter 21, Facts and Figures. <https://www.magnetic-resonance.org/ch/21-01.html>
8. Even in the rare case of magnet becoming unsealed, the negligible amount of helium escaping would not materially affect the oxygen level within the room.
9. Compared to existing ZBO systems in the industry.
10. The amount of helium saved is a calculation compared to a classic magnet with 1500 liters of helium
11. Compared to Philips SENSE
12. Sustainability Roadmap for Hospitals – A guide to achieving your sustainability goals, <http://www.sustainabilityroadmap.org/resources/#.Y5czhezMKo4>, accessed 31/12/24
13. Integrating Health and Energy Efficiency in Healthcare Facilities, U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, Federal Emergency Management Program, June 2021
14. Average Hospital Electric Bill: How to Uncover Savings, PC3 Cost Analysts / Utility / November 5, 2021 <https://www.costanalysts.com/average-hospital-electric-bill/>, accessed 12/09/22
15. For more details, see white paper 'Accuracy, power and endurance in MRI: A modern perspective on gradient system performance' https://www.philips.com/c-dam/b2bhc/master/resource-catalog/landing/mr-7700/white-paper-gradients.pdf?_ga=2.188849385.375935790.1673350325-591807102.1646036101
16. Applicable to MR 7700, Ambition X, BlueSeal XE, Ingenia 1.5T. Philips stand-by versus ready-to-scan mode based on COCIR. Results can vary based on system usage and system type. Results are based on typical hospital operating hours, assuming scanning hours: 10, stand-by hours: 12, long break hours: 1, short breaks of max 0.5 hour each, per day. Assuming 5 day per week and 50 working weeks.
17. Adaptive-C-SENSE-Net technology is the winner of Fast MRI Challenge hosted by Facebook AI research and New York Langone Health
18. 97% applicability on average, measured across a sample of sites from Philips MR installed base
19. Applicable to BlueSeal XE. Philips SmartSpeed power consumption versus Philips SENSE based scanning. Based on COCIR and in-house simulated environment. Results can vary based on site conditions.
20. Average cost savings compared to the purchase price of a similar new Philips system. Pricing depends on modality, product type, configuration, and other factors.
21. Based on the average weight re-use percentage per system for Philips MR, CT, Mobile C-arm & Image-guided therapy refurbished systems in 2023. Results may vary based on the amount, type, mix and age of returned systems.
22. Based on LCA using ReCiPe2008 and ecoinvent3.8 database, for a refurbished MR Ingenia Omega HD compared to a new MR Ingenia Omega HD, used in Paris, France and refurbished in Best, the Netherlands. Results will vary per system (type)/age, region/ country due to, amongst other things, source of energy and logistics.
23. Future Health Index 2022, <http://www.philips.com/futurehealthindex-2022>
24. <https://betterbusiness.torkusa.com/sustainable-hospitals-healthcare/>, accessed 31/12/2024

