

# Commentary for “Environmental Sustainability and MRI: Challenges, Opportunities, and a Call for Action”

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I'm sure that no-one reading this Commentary will disagree that MRI and MRS have had profound clinical benefits. This is thanks, in part, to many members of the International Society for Magnetic Resonance in Medicine (ISMRM) showing incredible ingenuity in: 1) developing technical approaches to maximizing image quality and contrast between healthy and diseased tissue; and 2) applying them in the clinic.

However, since MRI's inception over 50 years ago, the climate in which we operate has changed, quite literally. As in all walks of life, with the undeniable reality of climate change, it is time for introspection. Despite the many clear advantages of MRI for promoting and prolonging human health, the health of our population is intertwined with the health of our planet. While it is challenging nowadays to imagine a world without the medical insights offered by MRI, it is equally untenable to ignore the need to protect our planet—a planet that nurtures not only *our* health but the health of generations to come.

In this context, the article by Chaban et al. “Addressing the Environmental Impact of MRI in the Era of Climate Change” provides a wonderful service in reviewing how MRI affects the environment and what we can do about it.<sup>1</sup> In my humble opinion, every single person that uses MRI in their day-to-day work should study, reflect, and act on the recommendations in this article.

The article spotlights the challenges that MRI poses for the environment, including the amount of energy it uses, and the contamination of water bodies due to gadolinium-based contrast agents. These are things we all need to understand if we want to make MRI more environmentally friendly.

It is a challenging, enlightening and, at times, frightening read, with some staggering statistics. For example, that radiology and medical imaging departments contribute, globally, up to 1% of greenhouse gas emissions; that a single MRI scanner uses the same electricity as 26 four-person households. What surprised me most was that MRI scanners use up to 38% of this energy consumption during their “off-state.” The article contains many more nuggets of information that can, and should, serve as conversation starters within the MRI lab, MRI clinic or MRI manufacturing company.

I particularly applaud the authors for proposing actionable solutions, which they divide into two categories: those that reduce greenhouse gas emissions during the lifecycle of an MRI scanner, and those that protect against the impending effects of climate change.

For the former, there are so many great suggestions, including the use of AI to accelerate acquisitions; reducing “low value” imaging; transitioning from linear to circular manufacturing economies; donating used equipment to low-resource settings (provided local expertise is in place to operate and service the kit); embedding sustainability criteria in

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Level of Evidence: 5

Technical Efficacy: Stage 6

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the equipment procurement processes; and getting into the habit of “switching off” when we are done, as we all do with a lamp at home. It soon becomes clear that adopting many of these strategies not only has benefits for the environment, but brings multiple associated benefits, including cost savings, higher patient satisfaction, and perhaps even higher image quality (through reduced scan times and reduced patient movement).

The authors also highlight an interesting (but much less discussed) prospect of adaptation planning, forcing us all to think how we will respond to the inescapable realities of climate change, including those that affect healthcare delivery, infrastructure, and patient care. We need to prepare for how things might be different in the future due to global warming. It is not just about making MRI machines greener **now**, but also about getting ready for what is coming. We cannot afford to be like those that ignore the warnings in the 2021 allegorical film “Do not Look Up,” We need to talk, and we need to prepare.

For both categories of actionable solutions, I appeal to the ISMRM membership to show their characteristic ingenuity and resourcefulness in devising practical and efficient ways to move forward.

I extend my appreciation to the authors for catalyzing this dialogue. Overall, this is a call for collaboration, innovation, and

conscious decision-making across research, technology, and industry partnerships. Most of all, it is a call for conversation, bringing CO<sub>2</sub> emissions into the forefront of our conscience when making decisions about MRI.

The article could not have arrived at a better time, as we embark on a new journey within the ISMRM, setting up a Sustainability Committee to explore many of these issues, (and responding to the authors’ call for action from Professional Societies in the penultimate paragraph of their article). In my capacity as the President of the ISMRM, I wholeheartedly encourage each and every reader to engage with this discourse. I encourage lab chiefs to hold journal clubs on this article, and focus groups to consider how their lab could do better. Let’s all work together to find a balance between advancing medical technology and taking care of the world we live in. While we may have always strived for a legacy of more articles, more citations and more patents, we must now *also* consider the ecological legacy we leave behind. Here is to a future for imaging that is not just brighter, but also greener.

## Reference

1. Chaban YV, Vosshenrich J, McKee H, et al. Environmental sustainability and MRI: Challenges, opportunities, and a call for action. *J Magn Reson Imaging* 2023. <https://doi.org/10.1002/jmri.28994>.