PASC - How could a hpc center ever be sustainable?

High performance computing (hpc) is a resource-intensive business.
In recent years the hpc community has increased its efforts in sustainability. This is for example evidenced by the 2023 GREENER principles or the Energy-efficient HPC working group EE HPC WG list. Our center, HLRS, has implemented a validated environmental and energy management system (EMAS, ISO 50001). This shows the willingness of the community to address problems of resource consumption and sustainability. But there is somewhat of a paradox in aforementioned efforts. Cutting edge performance requires ever increasing resources, above all electrical power, but also semiconductors, raw materials, cooling fluids, land and obviously money to buy all of these. It thus stands to reason that the demand for compute is, at least in the first order, inelastic, i.e. increases in supply do not affect demand. For all sustainability efforts this means that whatever relative efficiency gains can be implemented, they do not translate to an absolute reduction of the ecological footprint. This effect was already observed by the economist Jevons during the industrial revolution in steam engines and their coal consumption and has later been called Jevons' paradox. Jevons' paradox affects hpc centers such as HLRS, because if demand for compute is inelastic, performance trades directly off power consumption. This means that the largest target of sustainability efforts cannot be attacked, lest at the cost of performance. We thus have a dilemma of conflicting goals. Obviously this dilemma cannot be solved by one single hpc center or the hpc community alone. The demand for performance is an externality which is partially imposed by society, by science and by politics. But it also partially reflects the narratives of the hpc world as told to their stakeholders. The aim of our talk is thus two fold. Firstly we will show how Jevons' paradox affects the sustainability efforts of HLRS by looking at selected indicators throughout the history of our center. Secondly we will discuss how we as a hpc center have positioned us within this dilemma and what we intend to do about it in the future. We close by asking if there is any prospect for changing the current hpc narrative so that absolute resource reductions can become part of it.