

## More power to energy efficient supercomputers

CSIRO's 'Bragg' cluster was recently named the world's 10th most energy-efficient supercomputer in the [Green5 Green500 list](#), which ranks the energy use of supercomputers according to performance-per-watt.



Credit: nadia/istock

[Bragg](#) uses less energy per MegaFLOP (FLOP is short for floating-point operations per second, a unit of supercomputer speed) than all but 9 of the world's fastest computers.

This is because Bragg is a GPU cluster, which means it gets its speed from [Graphic Processing Units \(GPUs\)](#) initially designed for graphics in computer games. GPUs can perform multiple tasks simultaneously at a fraction of the price of traditional computers.

The Bragg cluster has had three GPU upgrades during its four-year life. It is now ten times faster and twice as energy-efficient, performing 236 billion calculations per second using the same amount of power as an old 100-watt light bulb.

The Green500 list was set up in 2005 to provide a ranking of the most energy-efficient supercomputers in the world.

Its founders were concerned that, for decades, the notion of 'performance' has been synonymous with 'speed' (as measured in FLOPS). This has led to the emergence of supercomputers that consume massive amounts of electrical power and produce so much heat that huge cooling facilities must be constructed to ensure proper operation.

The Green500 website notes that the emphasis on speed as the ultimate metric has caused other metrics such as reliability, availability, and usability to be largely ignored. As a result, there has been an extraordinary increase in the

total cost of a supercomputer.

The aim of the list to raise awareness to other performance metrics of interest – eg performance per watt and energy efficiency for improved reliability – encouraging supercomputing stakeholders to ensure their machines ‘are only simulating climate change and not creating climate change’.

Bragg was named after Adelaide father-and-son physicists Lawrence and Henry Bragg, Australia’s first Nobel Prize winners. It handles CSIRO’s massive research data sets, complex computer modelling and simulation of dynamic processes. This enables better decisions about things like water security, bushfire preparedness, materials analysis, and [coastal water quality](#).

Source: CSIRO

From ECOS online <http://www.ecosmagazine.com/?paper=EC13286>