

# POINTERS

## GREEN SUPERCOMPUTERS

*The Green500 announces the most energy-efficient supercomputers of June 2013*

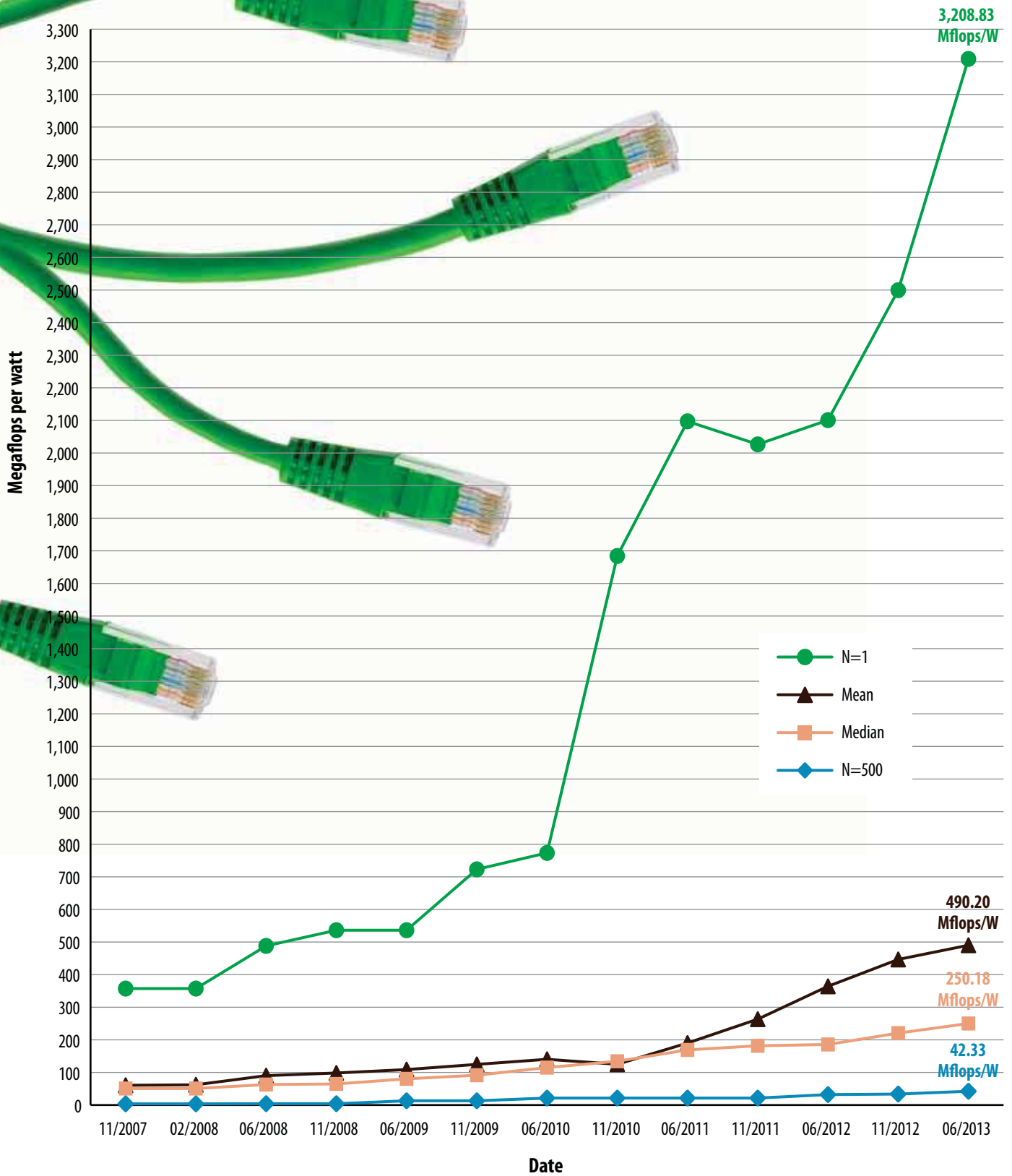


The Green500 list of June 2013 is dominated by heterogeneous supercomputers—those that combine two or more types of processing elements together, such as a traditional central processing unit (CPU) combined with a graphical processing unit (GPU) or a coprocessor.

Eurotech manufactured the top two supercomputers on the list—Eurora and Aurora Tigon. Eurora, located in Italy at Cineca, performs at 3.21 gigaflops per watt, while Aura Tigon, located in Italy at Selex ES Chieti, performs at 3.18 gigaflops per watt. These supercomputers are nearly 30% more energy efficient than the previous top supercomputer on the Green500 list. The fastest supercomputer of June 2013—Tianhe-2—performed at 1.9 gigaflops per watt, placing it in the number 32 spot on the Green500 list.

“Overall, the performance of machines on the Green500 List has increased at a higher rate than their power consumption. That’s why the machines’ efficiencies are going up,” says Wu Feng, founder of the Green500. For machines built with off-the-shelf components, a great deal of their efficiency gains can be attributed to heterogeneous designs; such a design allows these systems to keep pace and in some cases even outpace custom systems (e.g., IBM’s Blue Gene/Q).

“While the gains at the top end of the Green500 appear impressive, overall the improvements have been much more modest,” says Feng (see figure 1). “This clearly indicates that there is still work to be done.”



**FIGURE 1.** The energy efficiency of the highest-ranked supercomputers on the Green500 list (green circles) has been improving much more rapidly than the super (brown triangles) and the median (pink squares). For instance, while the energy efficiency of the greenest supercomputer improved by nearly 30%, the median improved by only about 14%, and the mean by only about 11%.