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Headway on low-energy chip

Cambridge scientists grow carbon nanotubes at low
temperatures in bid for energy savings

James Brown, Computing, 17 Aug 2006

Scientists at **Cambridge University** have developed a process to make low-energy, high-speed microprocessors that could drastically cut business IT energy bills.

The scientists have been working on growing carbon nanotubes on semiconductors at low temperatures, opening up the way for the material to be used to create high-speed, low power-consuming microchips.

Such processors could be used to create low-energy data centres for businesses, and allow mobile devices to work for longer.

Mirco Cantoro, leader of the project, says carbon nanotubes have great potential as a processing material and offer the possibility of more energy-efficient and powerful computers.

'Because of carbon nanotube's unique ability to dissipate heat better than other materials you can conceivably run it at very high speeds without breakdown,' he said.

'It is possible that nanotube-based microprocessors could reach very high levels of computer processing power.'

The work on lowering growth temperatures is part of a wider programme of research into carbon nanotubes at **Cambridge's Department of Engineering**.

Until now it was thought that carbon nanotubes needed temperatures of over 500 degrees celsius to form, which is too hot for integrating with other materials used in electronics. However, Cantoro and his research team have proved it is possible to grow nanotubes at 350 degrees, low enough to allow integration.

Quocirca analyst Bob Tarzey says that organisations are making it an increasingly high priority to identify new technologies that can reduce the amount of electricity consumed by their data centres.

'Data centres are becoming more and more expensive to run, because the amount of energy consumed by processors to run, and to be kept cool enough to keep functioning, is constantly increasing,' he said.

Nanotube-based microprocessors will also benefit companies that use large numbers of mobile devices, says Tarzey.

'They use a lot less power, allowing batteries to last longer, meaning more time can be spent in the field away from recharging points,' he said.

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