

# Software Guru: Clean Technology Bigger than Internet

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A global response to climate change will spur a business revolution bigger than the Internet, says co-founder of Sun Microsystems Bill Joy.

"This is a much larger opportunity," he told Reuters, pointing to the scale of the problem and the profits to be made from simple steps like a more careful use of energy.

"It's profitable to be more efficient, it has a negative cost and a competitive disadvantage if you don't do it.

"You can sensibly adopt old technology, not drive a truck, or insulate your house," he said, speaking on the fringes of the Cleantech investor conference in Frankfurt.

Joy made his name creating and developing computer operating systems and microprocessors, for example helping to design the Java programming language.

Most scientists agree that climate change is being caused by mankind's emissions of greenhouse gases, especially the carbon dioxide produced by burning fossil fuels such as coal and oil.

Using the example of the car industry, Joy saw the response in three parts: first using old technologies like smaller, more efficient cars; second adopting emerging technologies like "hybrid," part-electric cars; and third researching breakthroughs such as transport fuels derived from

farm waste.

Climate change would spur innovation and California's Silicon Valley, which originally served the semiconductor industry, was well placed to benefit, he said.

"Solar cells are semiconductors, heat to electricity is semiconductors, software to manage systems comes out of Silicon Valley," said Joy, who is now a partner at venture capital investors Kleiner Perkins Caufield & Byers (KPCB).

A global race is on to be first to commercialize breakthrough technologies which could make deep cuts in greenhouse gas emissions.

Research into safer, rechargeable lithium batteries is taking place mainly in the United States and Canada, but innovation in small electric cars is centered in Asia and Europe, he said.

"Smart people are everywhere."

Future breakthroughs will include more efficient solar cells that convert waste heat to electricity, and manipulation of catalysts at the ultra-tiny, or nano, scale to cut costs.

Climate change will create business losers, too: for example among U.S. car manufacturers which have resisted fuel efficiency standards, Joy reckoned.

"They lobbied Washington against innovation. The industry is now really in trouble, the car companies didn't innovate. Everyone's basically driving a truck."

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