Stanford eCorner

Making Big Data Sustainable

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Data may be the most significant driver of value and growth in the 21st century. Andy Karsner, senior strategist and “Space Cowboy” at X, explains the massive challenge humans face in accounting for the energy consumption of exponential data growth. The most important clean energy innovation of the 21st century, he suggests, will be to increase the thermal efficiency of semiconductors. Karsner stresses the importance of being as vigilant about data-center design as we are about building codes and vehicle engines.

Transcript

I think we have to say, look, oil is not the thing anymore.. Data is the thing, data is the new oil, data is the drive of all value and growth in the 21st century.. So what is the energy consumption profile of data since it is exponentially increasing? And so would you ask me what's most important to me? It is getting on top of the unchecked growth rate of data, which is fine to stay on check because it is helping humanity compute ironically it is what is the toolkit we will need to solve the greatest problems we have.. But to do that, we are suctioning uncounted for energy and not accounting for how that energy's footprint looks.. And so the thermal efficiency of a semiconductor chip, believe it or not, at the smallest level, what is happening in thermal efficiency that is driving the consumption of data centers is an all consuming thing to me.. How do you get the thermal efficiency of the knowledge tool at the atomic level that is driving all change of value and growth in the world and be as vigilant about that as we are to drive train for a vehicle.. How do we think about data centers and the building envelope and how the racks are stacked and the design architecture as vigilantly as we have building codes and high efficiency LEDs for our buildings, that is where I'm turning my biggest challenges I think existed energy right now...